

# 2010

## Physical Fitness Report of Macao SAR Citizens



human genome pr

```
0101 011 0101 0101 00 01 01010 11 01 100 101 0110 01 01 1011 01 010  
1 10 1 11 01 1 11 111 01010101 01 0101 10  
100 101 010 1 10 1 10 1010101011010 1110110101  
11 0 10 10 10101 1010 10101  
1 01101010 1010  
10 01 01010  
1 0 10 01  
1010 1011 0  
101010 101 0  
11 0101 10  
110 1 010  
100 110111011 1010  
1010 101010 0 010 101 101  
100 1 10 100011 101 0 101  
011010 010101 010 010  
010 1 01 10 1 1 01 0  
11 01 1 010 1 1 10 01010 1 01 110011 101001010110101  
110 10 10100 11010 1 0100 1101 101 210  
1 111010010010101 0100101 1010 0101010 1010
```

# **2010 Physical Fitness Report of Macao SAR Citizens**

**Macao Sport Development Board, Macao SAR**

Title : 2010 Physical Fitness Report of Macao SAR Citizens  
Publisher : Macao Sport Development Board, Macao SAR  
Website : <http://www.sport.gov.mo>  
E-mail address : [sport@macau.ctm.net](mailto:sport@macau.ctm.net)  
Cover designed by First Image Advertising Co., Ltd  
Size : 21cm x 29.7cm H  
Printed by First Image Advertising Co., Ltd  
Publication quantity : 1-1500  
Published in November, 2011  
Edition : 1<sup>st</sup> Edition  
ISBN 978-99937-892-9-1

## **Research institutes of “2010 Physical Fitness Report of Macao SAR Citizens”**

**Organizing institute:** Macao Sport Development Board

**Technical support institute:** China Institute of Sports Science, General Administration of Sport of China

**Coordinating institutes:** Department of Health  
Education and Youth Affairs Bureau  
Social Welfare Institute  
Tertiary Education Services Office  
Macao Polytechnic Institute

## **Technical Support Discussion Group of “2010 Physical Fitness Report of Macao SAR Citizens”:**

Team Leader: Tian Ye

Deputy Team Leader: Jiang Chongmin

Member: Cai Rui, Zhang Yanfeng, Wu Dongming, Li Ran,  
Zhang Ming, Wang Mei, Wang Huan, Wang Ronghui,  
Geng Yu, Chu Zeng, Luo Zhi, Le Liushen



## **Preface**

**Macao S.A.R. Government**

**Dr. Chui Sai On, Chief Executive**

The advancement of society and diversification of people's lives make physical fitness and health receive growing attention from the general public and scientific researchers. Many countries and regions are becoming more aware of the physical fitness study.

Through gradual coordination with Mainland China on physical fitness monitoring work, Macao successfully implemented the 2<sup>nd</sup> Macao Citizens' Physical Fitness Monitoring Study in 2010 following the 1<sup>st</sup> Physical Fitness Monitoring Study in 2005. The publication of "2010 Physical Fitness Report of Macao SAR Citizens" marks the latest academic achievement on physical fitness research in Macao. Aside from portraying the physical fitness status of Macao citizens in 2010, the report also compares 2005 and 2010 physical fitness data, thus helps to comprehend the changing trends of the physical fitness of Macao citizens.

The completion of the monitoring report signifies a gradual establishment of the physical fitness monitoring system in Macao. Monitoring the physical fitness condition of its citizens systematically and periodically over a five-year cycle with published results is an outstanding approach to motivate and educate the public to improve their physical fitness.

I sincerely congratulate the publishing of this report and wish that the findings on Macao citizens' physical fitness problems and their changing trends through the monitoring study will serve as references for the society to develop sports for all, to build and promote a healthy and harmonized lifestyle to enhance the physical fitness health of the citizens.

June, 2011



**Preface**  
**Secretary for Social Affairs and Culture of**  
**the Government of Macao Special Administrative Region**  
**Cheong U**

People's physical health is the wealth and resources of a society. Thus, strengthening physical fitness of the people is the focus of governments in many countries and regions.

The Government of Macao S.A.R. has always been concerned with the physical health of its citizens and has synchronized with the General Administration of Sport of China since 2005 to implement the quinquennial Macao Citizens Physical Fitness Monitoring Study. Periodic monitoring and results reporting are effective and meaningful ways of applying scientific methods to manage and utilize Macao citizens' physical status. This strategy is significant in guiding physical activities, enhancing physical fitness and overall health of the general public.

The research study monitoring Macao citizens' physical fitness in 2005 for ages 3-69 commenced the path for a periodic physical fitness monitoring and the collected data set a foundation for the dynamic long-term observations on the physical fitness status of Macao citizens and their changing patterns. Successful accomplishment of the 2<sup>nd</sup> Macao Citizens Physical Fitness Monitoring Study in 2010 with joint efforts from different departments further enhanced the physical fitness database of Macao citizens. Furthermore, the publishing of *2010 Physical Fitness Report of Macao SAR Citizens* will better reveal the changing trends of Macao citizens' physical status and their physical problems.

I hereby sincerely hope that with this opportunity, all sectors of the community will pay closer attention to the public's physical health and that through collaboration among relevant departments, the physical fitness standards of our citizens will be further improved.

May, 2011





## **Preface**

### **General Administration of Sport of China**

#### **Tian Ye-Director of China Institute of Sports Science**

The successful holding of Beijing Olympic Games in 2008 greatly enhanced people's enthusiasm, passion, awareness and consciousness towards participation in physical fitness and sports activities, and people had paid more attention to a physically active life-style. Based on various researches on physical fitness, Macao Sport Development Board organized and implemented the Physical Fitness Study of Macao Citizens in 2005; a 2<sup>nd</sup> physical fitness study was performed in 2010 which fully reflected that Macao Government paid a high attention to the physical fitness of Macao citizens. To carry out physical fitness study periodically is an important fundamental work for the government to master the physical conditions, strengthen physical fitness and improve health status of the citizens. The "Physical Fitness Report of Macao SAR Citizens" based on the physical fitness study reflects the current physical conditions of Macao citizens precisely, analyzes the factors that influence and change the physical fitness of citizens, and this will give a positive effect on strengthening the physical fitness of the citizens.

During this physical fitness study of Macao citizens, China Institute of Sports Science and Macao Sport Development Board cooperated successfully on the aspects of technology and organization and remarkable achievement has been gained. It is with confidence that the cooperation between us will be strengthened and expanded continuously, which will make a great contribution on improving the physical fitness and health of the Chinese Nation.

May 10, 2011



## Prologue

“Promoting the philosophy of scientific sports and fitness, improving physical health knowledge” is the objective of Macao S.A.R. government in the area of sports and exercise. Periodic scientific physical fitness monitoring is an excellent way of comprehending the physical fitness condition and changing fitness trend, and in formulating policies to enhance people’s awareness as well as initiative on fitness and exercise. Thus, implementation of a regular physical fitness monitoring helps to advance the overall health and fitness of the people.

In 2010, General Administration of Sport of China in association with relevant organizations implemented the 3<sup>rd</sup> National Physical Fitness Monitoring, an effective mean of building a sports service system for the general public and promoting fitness scientifically. After frequent exchanges and coordination with Mainland China on physical fitness monitoring work, Macao S.A.R. government has proceeded at the same pace with General Administration of Sport of China on the quinquennial National Physical Fitness Monitoring since 2005 and implemented the 1<sup>st</sup> Macao Citizens Physical Fitness Monitoring Study for age 3-69, acquiring early 21<sup>st</sup> century basic data on the physical status of Macao citizens, establishing Macao physical fitness database and building the foundation for a dynamic long term observation on the physical fitness status of Macao citizens and their changing patterns.

Based on the Macao Citizens Physical Fitness Monitoring Study in 2005, Macao Development Board organized the 2<sup>nd</sup> monitoring study in 2010. Monitoring subjects were age 3-69 Macao citizens of four different age groups, namely young children (age 3-6), children and adolescents (age 6-22 students), adults (age 20-59) and seniors (age 60-69). With continuous technical support from China Institute of Sports Science under General Administration of Sport of China and assistance from Department of Health, Education and Youth Affairs Bureau, Social Welfare Institute, Tertiary Education Services Office and Macao Polytechnic Institute, the monitoring work was successfully accomplished from January to April in 2010. Subjects were selected randomly from 63 organizations including kindergartens, schools, government organizations, private organizations, associations and senior centers. A total of 10,326 valid samples were collected which consisted of 1,065 young children, 5,130 children and adolescents (students), 3,540 adults and 591 seniors. After analyzing the data, this report on the monitoring was composed to enable the society to better understand the outcome of the 2<sup>nd</sup> Macao Citizens Physical Fitness Monitoring Study.

I would like to take this opportunity to express my most sincere gratitude to China Institute of Sports Science under General Administration of Sport of China, Department of Health, Education and Youth Affairs Bureau, Social Welfare Institute, Tertiary Education Services Office, Macao Polytechnic Institute, all participated organizations and volunteer workers for their support, assistance and dedication on the accomplishment of the 2<sup>nd</sup> Macao Citizens Physical Fitness Monitoring Study.

Vong Iao Lek

President of the Macao Sport Development Board

May, 2011

## Contents

<b>Part I Physical Fitness Study and Implementation.....</b>	<b>1</b>
<b>1. Development and Basic Conditions of Macao Society in 2010.....</b>	<b>2</b>
<b>2. Subjects and Methods .....</b>	<b>3</b>
<b>2.1. Subjects .....</b>	<b>3</b>
<b>2.2. Sampling Methods .....</b>	<b>3</b>
2.2.1 Principles .....	3
2.2.2. Methods .....	4
2.2.3. Grouping and Number of Subjects.....	5
2.2.4. Calculation of Age.....	5
2.2.5. Principles of Sample Selection .....	6
<b>2.3. Examined Variables .....</b>	<b>6</b>
2.3.1. Index Inquiry.....	6
2.3.2. Examined Variables.....	10
<b>2.4. Testing Apparatus .....</b>	<b>11</b>
<b>2.5. Testing Methods .....</b>	<b>11</b>
<b>2.6. Scheduling .....</b>	<b>11</b>
<b>3. Organization and Implementation .....</b>	<b>12</b>
<b>3.1. Work Preparation .....</b>	<b>12</b>
3.1.1. Establishment of Organizational Network and Leadership.....	12
3.1.2. Determination of Study Contents and Completion of Study Plan .....	12
3.1.3. Establishment of Study Teams .....	12
3.1.4. Apparatus Preparation .....	13
<b>3.2. Technical Training.....</b>	<b>13</b>
<b>3.3. Data Acquisition.....</b>	<b>13</b>
<b>3.4. Data Summarization .....</b>	<b>13</b>
<b>4. Quality Control.....</b>	<b>14</b>
<b>4.1. Quality Control of Organization Management.....</b>	<b>14</b>
4.1.1. Organization of Network .....	14
4.1.2. Establishment and Training of Study Teams.....	15
4.1.3. Determination of Subjects and Establishment of Study Sites.....	16

4.1.4. Design of Indexes and Determination of Testing Apparatus .....	17
4.1.5. Study Procedures.....	17
<b>4.2. Quality Control During the Study Process.....</b>	<b>18</b>
4.2.1. Preparation Before Study.....	18
4.2.2. Quality Control During Study.....	20
<b>4.3. Quality Control After Examination.....</b>	<b>29</b>
4.3.1. Checking of Data Registration Manual .....	29
4.3.2. Examination of Data Registration Manual .....	30
4.3.3. Data Entry .....	31
4.3.4. Checking of Entry Results .....	32
4.3.5. Database Establishment .....	32
<b>5. Data Handling .....</b>	<b>33</b>
<b>5.1. Data Cleaning.....</b>	<b>33</b>
<b>5.2. Statistical Analysis.....</b>	<b>40</b>
5.2.1. Grouping .....	40
5.2.2. Indexes.....	41
5.2.3. Contents of Calculation .....	43
5.2.4. Elaboration on Calculation Methods.....	44
5.2.5. Statistics Tools.....	46
<b>Part II Monitoring Results .....</b>	<b>47</b>
<b>1. Young Children.....</b>	<b>48</b>
<b>1.1. Physical Fitness Conditions of Young Children in 2010 .....</b>	<b>48</b>
1.1.1. Basic Information of the Subjects .....	48
1.1.2. Lifestyle .....	48
1.1.2.1. Birth and feeding methods .....	48
1.1.2.2. Habits .....	49
1.1.2.3. Physical exercise .....	51
1.1.2.4. Occurrence of diseases .....	52
1.1.3. Anthropometric Measurements .....	53
1.1.3.1. Length indexes.....	53
1.1.3.2. Weight and BMI.....	55
1.1.3.3. Circumference indexes.....	56
1.1.3.4. Width indexes .....	58

1.1.3.5. <i>Body composition</i> .....	58
1.1.4. <i>Physiological Function</i> .....	60
1.1.5. <i>Physical Fitness</i> .....	61
1.1.5.1. <i>Speed and sensitivity</i> .....	61
1.1.5.2. <i>Strength</i> .....	62
1.1.5.3. <i>Flexibility</i> .....	63
1.1.5.4. <i>Balance</i> .....	63
1.1.6. <i>Health</i> .....	64
1.1.6.1. <i>Occurrence of decayed primary teeth</i> .....	64
1.1.6.2. <i>Occurrence of decayed permanent teeth</i> .....	67
<b>1.2. Comparison of 2005 and 2010 Results on the Physical Fitness Study of Macao Young Children</b> .....	<b>67</b>
1.2.1. <i>Comparison of Basic Information of the Subjects</i> .....	67
1.2.2. <i>Comparison of Lifestyle</i> .....	67
1.2.2.1. <i>Birth and feeding methods</i> .....	67
1.2.2.2. <i>Habits</i> .....	68
1.2.2.3. <i>Physical exercise</i> .....	68
1.2.2.4. <i>Occurrence of diseases</i> .....	68
1.2.3. <i>Comparison of Anthropometric Measurements</i> .....	69
1.2.3.1. <i>Length</i> .....	69
1.2.3.2. <i>Weight and BMI</i> .....	69
1.2.3.3. <i>Circumference indexes</i> .....	70
1.2.3.4. <i>Width indexes</i> .....	71
1.2.3.5. <i>Body composition</i> .....	72
1.2.4. <i>Comparison of Physiological Function</i> .....	73
1.2.5. <i>Comparison of Physical Fitness</i> .....	73
1.2.5.1. <i>Speed and sensitivity</i> .....	73
1.2.5.2. <i>Strength</i> .....	74
1.2.5.3. <i>Flexibility</i> .....	74
1.2.5.4. <i>Balance</i> .....	75
1.2.6. <i>Comparison of Health Status</i> .....	75
1.2.6.1. <i>Occurrence of decayed primary teeth</i> .....	75
1.2.6.2. <i>Occurrence of decayed permanent teeth</i> .....	77
<b>1.3. Summary</b> .....	<b>77</b>
1.3.1. <i>Summary of 2010 Results on the Physical Fitness Study of Young Children</i> .....	77
1.3.2. <i>Comparison of 2010 and 2005 Physical Fitness Study Results of Young Children</i> .....	77



<b>2. Children and Adolescents (Students).....</b>	<b>79</b>
<b>2.1. Physical Fitness Conditions of Children and Adolescents (Students) in 2010.....</b>	<b>79</b>
2.1.1. Basic Information of the Subjects .....	79
2.1.2. Lifestyle .....	80
2.1.2.1. <i>Habits</i> .....	80
2.1.2.2. <i>Physical education at school</i> .....	82
2.1.2.3. <i>Extracurricular physical exercise</i> .....	84
2.1.2.4. <i>Occurrence of diseases</i> .....	87
2.1.3. Anthropometric Measurements .....	88
2.1.3.1. <i>Length indexes</i> .....	88
2.1.3.2. <i>Weight and BMI</i> .....	90
2.1.3.3. <i>Circumference indexes</i> .....	91
2.1.3.4. <i>Width indexes</i> .....	93
2.1.3.5. <i>Body composition</i> .....	94
2.1.4. Physiological Function .....	97
2.1.4.1. <i>Resting pulse</i> .....	97
2.1.4.2. <i>Blood pressure</i> .....	98
2.1.4.3. <i>Vital capacity</i> .....	99
2.1.5. Physical Fitness .....	101
2.1.5.1. <i>Speed</i> .....	101
2.1.5.2. <i>Strength</i> .....	101
2.1.5.3. <i>Endurance run</i> .....	104
2.1.5.4. <i>Flexibility</i> .....	105
2.1.5.5. <i>Respond</i> .....	105
2.1.5.6. <i>Balance</i> .....	106
2.1.6. Health.....	106
2.1.6.1. <i>Occurrence of decayed primary teeth</i> .....	106
2.1.6.2. <i>Occurrence of decayed permanent teeth</i> .....	109
2.1.6.3. <i>Poor eyesight</i> .....	111
2.1.6.4. <i>Color vision</i> .....	113
<b>2.2. Comparison of 2005 and 2010 Physical Fitness Results of Macao Children and Adolescents (Students).....</b>	<b>113</b>
2.2.1. Comparison of Basic Information of the Subjects .....	113
2.2.2. Comparison of Lifestyle .....	114
2.2.2.1. <i>Habits</i> .....	114
2.2.2.2. <i>Physical education at school</i> .....	117
2.2.2.3. <i>Extracurricular physical exercise</i> .....	118

2.2.2.4. Occurrence of diseases .....	118
2.2.3. Comparison of Anthropometric Measurements .....	119
2.2.3.1. Length indexes.....	119
2.2.3.2. Weight and BMI.....	121
2.2.3.3. Circumference indexes.....	123
2.2.3.4. Width indexes .....	126
2.2.3.5. Body composition .....	128
2.2.4. Comparison of Physiological Function .....	132
2.2.4.1. Resting pulse .....	132
2.2.4.2. Blood pressure.....	132
2.2.4.3. Vital capacity.....	134
2.2.5. Comparison of Physical Fitness .....	136
2.2.5.1. Speed .....	136
2.2.5.2. Strength.....	136
2.2.5.3. Endurance run.....	140
2.2.5.4. Flexibility.....	141
2.2.5.5. Respond .....	142
2.2.5.6. Balance .....	143
2.2.6. Comparison of Health Status .....	144
2.2.6.1. Occurrence of decayed primary teeth .....	144
2.2.6.2. Occurrence of decayed permanent teeth.....	146
2.2.6.3. Poor eyesight.....	148
2.2.6.4. Color vision.....	149
<b>2.3. Summary .....</b>	<b>150</b>
2.3.1. Summary of 2010 Results on the Physical Fitness Study of Children and Adolescents (Students).....	150
2.3.2. Comparison of 2010 and 2005 Results on the Physical Fitness Study of Children and Adolescents (Students).....	151
<b>3. Adults .....</b>	<b>152</b>
<b>3.1. Physical Fitness Conditions of Adults in 2010.....</b>	<b>152</b>
3.1.1. Basic Information of the Subjects .....	152
3.1.2. Lifestyle .....	154
3.1.2.1. Habits .....	154
3.1.2.2. Physical exercise .....	156
3.1.2.3. Occurrence of diseases .....	159
3.1.2.4. Understanding of the physical fitness study.....	160
3.1.3. Anthropometric Measurements .....	160

3.1.3.1. Length indexes.....	160
3.1.3.2. Weight and BMI.....	162
3.1.3.3. Circumference indexes.....	163
3.1.3.4. Width indexes.....	165
3.1.3.5. Body composition.....	166
3.1.4. Physiological Function.....	169
3.1.4.1. Resting pulse.....	169
3.1.4.2. Blood pressure.....	169
3.1.4.3. Vital capacity.....	171
3.1.4.4. Step test index.....	172
3.1.5. Physical Fitness.....	172
3.1.5.1. Strength.....	172
3.1.5.2. Flexibility.....	174
3.1.5.3. Respond.....	175
3.1.5.4. Balance.....	175
<b>3.2. Comparison of 2005 and 2010 Results on the Physical Fitness Study of Macao Adults.....</b>	<b>176</b>
3.2.1. Comparison of Basic Information of the Subjects.....	176
3.2.2. Comparison of Lifestyle.....	177
3.2.2.1. Habits.....	177
3.2.2.2. Physical exercise.....	180
3.2.2.3. Occurrence of diseases and understanding of the physical fitness test.....	183
3.2.3. Comparison of Anthropometric Measurements.....	184
3.2.3.1. Length indexes.....	184
3.2.3.2. Weight and BMI.....	185
3.2.3.3. Circumference indexes.....	187
3.2.3.4. Width indexes.....	188
3.2.3.5. Body composition.....	189
3.2.4. Comparison of Physiological Function.....	191
3.2.4.1. Resting pulse.....	191
3.2.4.2. Blood pressure.....	192
3.2.4.3. Vital capacity and vital capacity/weight ratio.....	193
3.2.4.4. Step index.....	193
3.2.5. Comparison of Physical Fitness.....	194
3.2.5.1. Strength.....	194
3.2.5.2. Flexibility.....	195
3.2.5.3. Respond.....	196
3.2.5.4. Balance.....	196

<b>3.3. Summary .....</b>	<b>197</b>
3.3.1. Basic Information .....	197
3.3.2. Lifestyle .....	197
3.3.3. Occurrence of Diseases and Understanding of Physical Fitness Study .....	198
3.3.4. Anthropometric, Physiological Function and Physical Fitness Information .....	198
<b>4. Seniors.....</b>	<b>200</b>
<b>4.1. Physical Fitness Conditions of Seniors in 2010 .....</b>	<b>200</b>
4.1.1. Basic Information of the Subjects .....	200
4.1.2. Lifestyle .....	202
4.1.2.1. Habits .....	202
4.1.2.2. Physical exercise .....	207
4.1.2.3. Occurrence of diseases .....	209
4.1.2.4. Understanding of the physical fitness study .....	209
4.1.3. Anthropometric Measurements .....	210
4.1.3.1. Length indexes.....	210
4.1.3.2. Weight and BMI.....	211
4.1.3.3. Circumference indexes.....	212
4.1.3.4. Width indexes .....	214
4.1.3.5. Body composition .....	215
4.1.4. Physiological Function .....	217
4.1.4.1. Resting pulse .....	217
4.1.4.2. Blood pressure.....	218
4.1.4.3. Vital capacity.....	219
4.1.5. Physical Fitness .....	220
4.1.5.1. Strength.....	220
4.1.5.2. Flexibility.....	220
4.1.5.3. Respond .....	221
4.1.5.4. Balance .....	222
<b>4.2. Comparison of 2005 and 2010 Results on the Physical Fitness Study of Macao Seniors .....</b>	<b>222</b>
4.2.1. Comparison of Basic Information of the Subjects .....	222
4.2.2. Comparison of Lifestyle .....	223
4.2.2.1. Habits .....	223
4.2.2.2. Physical exercise .....	226
4.2.2.3. Occurrence of diseases .....	230
4.2.2.4. Understanding of the physical fitness study .....	230

4.2.3. Comparison of Anthropometric Measurements .....	231
4.2.3.1. Length indexes.....	231
4.2.3.2. Weight and BMI.....	232
4.2.3.3. Circumference indexes.....	233
4.2.3.4. Width indexes .....	234
4.2.3.5. Body composition .....	234
4.2.4. Comparison of Physiological Function .....	235
4.2.4.1. Resting pulse .....	235
4.2.4.2. Blood pressure.....	236
4.2.4.3. Vital capacity.....	237
4.2.4.4. Vital capacity/weight.....	237
4.2.5. Comparison of Physical Fitness .....	237
4.2.5.1. Strength.....	237
4.2.5.2. Flexibility.....	238
4.2.5.3. Respond .....	238
4.2.5.4. Balance.....	239
<b>4.3. Summary .....</b>	<b>239</b>
4.3.1. Summary of 2010 Results on the Physical Fitness Study of Seniors .....	239
4.3.2. Comparison of 2010 and 2005 Results on the Physical Fitness Study of Seniors .....	240
<b>Part III   Statistic Data .....</b>	<b>241</b>
<b>1. Young Children.....</b>	<b>242</b>
1.1. Basic Information of the Subjects .....	242
1.2. Lifestyle .....	243
1.3. Anthropometric Measurements.....	247
1.4. Physiological Function .....	251
1.5. Physical Fitness .....	251
1.6. Health .....	252
<b>2. Children and Adolescents (Students).....</b>	<b>253</b>
2.1. Basic Information of the Subjects .....	253
2.2. Lifestyle .....	255
2.3. Anthropometric Measurements.....	273
2.4. Physiological Function .....	290

2.5. Physical Fitness .....	296
2.6. Health .....	306
<b>3. Adults .....</b>	<b>310</b>
3.1. Basic Information of the Subjects .....	310
3.2. Lifestyle .....	313
3.3. Anthropometric Measurements .....	328
3.4. Physiological Function .....	336
3.5. Physical Fitness .....	340
<b>4. Seniors.....</b>	<b>343</b>
4.1. Basic Information of the Subjects .....	343
4.2. Lifestyle .....	346
4.3. Anthropometric Measurements .....	353
4.4. Physiological Function .....	356
4.5. Physical Fitness .....	357
<b>Part IV Appendix.....</b>	<b>359</b>
<b>Appendix 1: Data Registration Manual of 2010 Physical Fitness Study of Macao SAR Citizens.....</b>	<b>360</b>
<b>Appendix 2: Methods for Filling out “2010 Physical Fitness Study of Macao SAR Citizens” Questionnaire .....</b>	<b>395</b>
<b>1. Basic Information.....</b>	<b>395</b>
1.1. Name and Gender .....	395
1.2. Age .....	395
1.3. Name, Address and Telephone Number of Kindergarten, School, Working Unit and Affiliated Unit .....	395
<b>2. Category by Code .....</b>	<b>395</b>
2.1. Macao ID Card Number.....	395
2.2. Gender .....	395
2.3. Date of Birth and Examination Date.....	396
2.4. Code Number of Kindergarten, School, Working Unit and Affiliated Unit.....	396
2.5. Serial Number .....	396

2.6. Years of Residence in Macao .....	397
2.7. Occupation Code.....	397
<b>3. Questionnaire.....</b>	<b>397</b>
<b>3.1 Types of Questionnaire and Filling Methods .....</b>	<b>397</b>
3.1.1. Single Choice Question .....	397
3.1.2. Multiple Choice Question.....	397
<b>3.2. Methods for Filling in Questionnaire for Each Age Group .....</b>	<b>398</b>
3.2.1. Questionnaire for Young Children .....	398
3.2.2. Questionnaire for Children and Adolescents (Students).....	403
3.2.3. Questionnaire for Adults and Seniors.....	404
<b>4. Examined Indexes .....</b>	<b>406</b>
<b>Appendix 3: Methods of Examining the Indexes of 2010 Physical Fitness Study of Macao SAR Citizens .....</b>	<b>407</b>
<b>1. Anthropometric Indexes.....</b>	<b>407</b>
<b>2. Physiological Function Indexes.....</b>	<b>414</b>
<b>3. Physical Fitness.....</b>	<b>418</b>
<b>4. Health Indexes .....</b>	<b>435</b>
<b>Appendix 4: Sampling Sites of 2010 Physical Fitness Study of Macao SAR Citizens .....</b>	<b>439</b>
<b>Acknowledgement .....</b>	<b>442</b>

# PART I

## Physical Fitness Study and Implementation

human genome project



```
0101 011 0101 0101 1100 01 01010 11 01 100 101 0110 01 01 1011 01 0101
1 10 1 11 01 1 11 111 01010101 01 0101 10
10 0 101 010 1 10 1 10 101010101 1010 1110110101
11 0 10 10 10101 1010 10101
1 01101010 1010
10 01 01010
1 0 10 01
1010 1011 0
101010 101 0
11 0101 10
110 1 010
100 110111011 1010
1010 105 010 00100 0 010 101 101
100 1 10 100011 101 0 101
011010 010101 010 010
010 1 01 10 1 1 01 0
11 01 1 010 1 1 1 10 01010 1 01 110011 101001010110101
110 10 10100 11010 1 010 0 1101 101 210
1 111010010010101 0100101 1010 0101010 1010
```



## Part I Physical Fitness Study and Implementation

### 1. Development and Basic Conditions of Macao Society in 2010

Macao, located in the south of China, is made up of Macao Peninsula, Taipa Island and Coloane. Situated at the southwest mouth of Pearl River Estuary and backed by the Pearl River Delta, Macao is 40 sea miles away from Hong Kong east of Pearl River Estuary, across the water from Zhuhai City's Wan Chai in the west, with Gongbei, Zhuhai District in the north border. Nowadays, Macao covers an area of 29.2 square kilometers, with a population of 545700, of which 93.8% of the residents are Chinese, 1.7% are Portuguese and the Philippines account for 2%.

Macao's economic structure consists of export and manufacturing, tourism and gambling industry, finance industry, as well as property and construction industry. Export and manufacturing which ranked top among the four economic pillars was leading Macao's economy between mid-1960s and mid-1980s; however, gave way to tourism and lottery industry at the end of 1980s.

Tourism and lottery industry has a long history and the former accounts for 1/3 of Macao's GDP. In essence, it is composed of travel agents, hotels, casinos and entertainment places as well as other auxiliary service industries of which the gambling industry is the main source of Macao government's annual financial revenues.

Macao's financial industry mainly constitutes banking and insurance. At present, there are over 20 banks with almost 100 branches and more than 10 insurance companies in Macao.

In recent years, Macao government establishes policies to stimulate and stabilize the economic environment. Being the host of 2005 East Asia Games, Macao completed a large quantity of infrastructure and several gambling and tourism facilities, thus progressing the construction industry in Macao. In the first half of 2005, new constructions increased by 46.8% to 138000 m<sup>2</sup>. In addition, 19485 building units totaling MOP\$12.16 billion were sold, an increase of 59.6% and 82.6% respectively.

On December 20th, 1999, the PRC resumed the exercise of sovereignty over Macao. Macao SAR was formally founded and began to undertake the responsibility of governing affairs. Under the guidance of the "one country, two systems" principles, the "Macao people to administer Macao" policy and a high degree of autonomy, Macao has been enjoying a stable society and prosperous economy. Statistically, Macao's economy system still remains the most open after the transfer of political power to the PRC in 1999. After experiencing years of economic decline, Macao's economic index recovered in 2000 with an increase rate of 4%. In particular, Macao's GDP per capita which was MOP\$20000 reached an all-time high and surpassed Hong Kong in 2006 and the enterprises in Macao were progressing gradually.

Macao is a place where east and west cultures meet. Being a fundamental structure in sports, Sports for All plays a significant role in Macao's sports affairs. Since Sports for All has enormous participants and is diverse in forms and functions, it is becoming more important in Macao's modern life and receiving wide attention from the government and the society. Following the gaining prosperity of Macao's economy,

diverse culture, advanced living standards and changing life style, Macao's Sports for All will enter a new stage.

With the continual development of the society and economy, governments are prioritizing their citizens' physical fitness. Being part of this comprehensive human quality system and the bases of other qualities, physical fitness and health are drawing much attention. Since the 21st century, Macao has devoted major efforts to develop its social economy, increase sports affairs, promote, exchange and cooperate with Mainland China and other nations to enhance the overall sports programs. Physical fitness study is a vital way to comprehend the citizens' physical status and is a major interest of the Macao government. From 2001 to 2002, Macao Sport Development Board, the Research Institute of Sports Science under the General Administration of Sport, Macao Polytechnic Institute and other disciplines implemented a physical fitness study on aged 20-59 adults. In 2005, with joint efforts from both Macao government and Mainland, the physical fitness study of Macao citizens (aged 3-69) was organized at the same time with Mainland and was part of the national physique fitness study, thus perfecting the national physical fitness study network. Physical fitness study of Macao citizens in 2010 is the second study on all ages in the history of Macao physical fitness study. It will better manage Macao citizens' physical condition, perfect the physical fitness database, establish a good foundation for the dynamic observation and research on the changing patterns of Macao citizens physical fitness status, and provide scientific basis for the government to formulate policies to promote Macao citizens' physical exercise.

## **2. Subjects and Methods**

### **2.1. Subjects**

Subjects were Macao citizens aged 3-69 and were categorized into four age groups: young children (aged 3-6), children and adolescents (students, aged 6-22), adults (aged 20-59) and seniors (aged 60-69). Young children meant those who have lived in Macao for at least 3 years. Students, adults and seniors meant those who have lived in Macao for at least five years.

Qualified subjects should meet the following criteria: healthy and free from congenital or hereditary diseases such as heart disease, brain paralysis, deaf-mutism, dementia, mental disorder, dysplasia, and other acute or chronic diseases such as rheumatic heart disease, hypertension etc. Subjects must be endowed with self-caring ability, acceptable verbal skills, thinking and reception ability, as well as ability to perform basic physical activities.

### **2.2. Sampling Methods**

#### **2.2.1 Principles**

Subjects were selected randomly from different age groups. In order to carry out comparative study, the subjects selected were based on the previous selected organizations in 2005 and adjusted or supplemented accordingly.

### **2.2.2. Methods**

The method used for supplementing organizations was the same as the method used in 2005.

#### (1) Yong children

The kindergartens (or schools) were categorized according to their locations in the community and were divided into the following areas: 1) Nossa Senhora de Fátima (north area), mainly industrial and residential, densely populated and mostly consisted of new immigrants, 2) Santo António and S. Lázaro (central area), commercial and residential regions with comparatively dense population, 3) S.Lourenço, Sé Catedral, Nossa Senhora do Carmo and São Francisco Xavier (south area and island area), tourism and gambling regions in Macao, where Sé Catedral is the central commercial district with comparatively small population. Two kindergartens were selected from each area. Students of the same class were grouped as a unit from which the samples were drawn to obtain appropriate age. If the two kindergartens did not provide enough valid subjects, subjects would be randomly picked from the third randomly selected kindergarten.

#### (2) Children and Adolescents (Students)

Primary and secondary school students: were categorized according to their locations in the community and were divided into the following areas: 1) Nossa Senhora de Fátima (north area), mainly industrial and residential, densely populated and mostly consisted of new immigrants, 2) Santo António and S. Lázaro (central area), commercial and residential regions with comparatively dense population, 3) S.Lourenço, Sé Catedral, Nossa Senhora do Carmo and São Francisco Xavier (south area and island area), tourist and gambling regions in Macao, where Sé Catedral is the central commercial district with comparatively small population. Two schools were selected from each area. Students of the same class were grouped as a unit from which the samples were drawn to obtain appropriate age. If the two schools did not provide enough valid subjects, subjects would be randomly picked from the third randomly selected school.

University students: based on universities and colleges in Macao, the entire department was selected randomly for sampling. Any colleges or universities with special physical requirements shall not be included.

#### (3)Adults

Adults were divided into labour intensive and non-labour intensive workers. N sampling sites were randomly selected from different government and business organizations. Personnel of the same department were grouped as a unit from which the samples were drawn to obtain appropriate age.

#### (4)Seniors

Based on senior agencies in Macao, subjects were categorized according to their locations in the community and were divided into the following areas: 1) Nossa Senhora de Fátima (north area), mainly industrial and residential, densely populated and mostly consisted of new immigrants, 2) Santo António and S. Lázaro (central area), commercial and residential regions with comparatively dense population, 3)

S.Lourenço, Sé Catedral, Nossa Senhora do Carmo and São Francisco Xavier (south area and island area), tourism and gambling regions in Macao, where Sé Catedral is the central commercial district with comparatively small population. Two senior agencies were selected from each area from which the samples were drawn to obtain appropriate age. If the two senior agencies did not provide enough valid subjects, subjects would be randomly picked from the third randomly selected senior agency.

**2.2.3. Grouping and Number of Subjects**

(1) Young children

Subjects were grouped into two categories: male and female.

Each age group differed by half a year, giving rise to 16 groups in total (n = 55/group) with 880 subjects.

(2) Children and Adolescents (Students)

Primary and secondary school students: subjects were grouped into two categories: male and female. Each age group differed by one year, giving rise to 26 groups in total (n = 55/group in each area) with 4290 subjects.

University students: subjects were grouped into two categories: male and female. Each age group differed by one year, giving rise to 8 groups in total (n = 105/group) with 840 subjects.

(3) Adults

The adult subjects were divided into two groups: labor intensive and non-labor intensive workers. They were also classified according to gender and age. Each age group differed by five years (ages 20-24, 25-29....55-59), 4 categories giving rise to 32 groups in total (n = 105/group) with 3360 subjects.

(4) Seniors

Subjects were grouped into two categories: male and female. Each age group differed by five years (ages 60-64, 65-69), giving rise to 4 groups in total (n = 105/group) with 420 subjects.

The total number of subjects in this study was 9,790.

**2.2.4. Calculation of Age**

In this study, subjects’ age should be calculated as follows:

(1) 3-6 years old (young children)

Birthday has passed for more than 6 months during the study: Age = 2010 – birth year + 0.5

Birthday has passed but less than 6 month during the study: Age = 2010 – birth year

Birthday will be coming in less than 6 months after the study: Age = 2010 – birth year – 0.5

Birthday will be coming in more than 6 months after the study: Age = 2010 – birth year – 1

(2) 6-69 years old

Birthday has passed during the study: Age = 2010 – birth year

Birthday has not passed during the study: Age = 2010 – birth year – 1

### **2.2.5. Principles of Sample Selection**

(1) Equal portion of the subjects from different groups (gender, age and profession) should be selected from all areas.

(2) Even distribution of the samples from each adult and senior age group. For example, in the 20-24 age groups with 105 subjects, the number of subjects from aged 20, 21, 22, 23 or 24 should each be about 20.

(3) Distinction of adult work categories. Labour intensive workers were customer service personnel or salesmen, skilled workers of the fishery and agriculture field, craftsmen, machine operators, drivers and assemblers, and non-technical workers etc. The non-labour intensive workers were legislative officers, public administration officers, heads of organizations or managers, professionals and office clerks etc.

## **2.3. Examined Variables**

In this study, physique of the subjects was examined and questionnaires were given. Physique examination included measurements of anthropometric, functional and physical fitness indexes. For young children, dental decay was included. For students, dental decay, eyesight, color vision were also examined. Information on the characteristics and lifestyle of the subjects were obtained from questionnaires in Appendix 2 of Part IV.

### **2.3.1. Index Inquiry**

Index inquiry was mainly performed by questionnaires. Different questionnaire contents were designed according to different ages. Demographic information, lifestyle and physical exercise habits were included. Questionnaire contents are shown as follows:

#### **I. Young children**

##### **(I) Personal Information of Young Child**

1. Birth place
2. Community of residence
3. Birth weight (kg)
4. Birth length (cm)
5. Gestational age
6. Types of feeding within four months after birth
7. Number of siblings
8. Birth order among siblings

9. Frequency of flu or fever within the past year
  10. Diseases diagnosed by doctors
  11. Diseases experienced (in order of precedence, at most three diseases):
  12. Average sleeping hours per day (including naps)
  13. Kindergarten attendance
  14. Guardian at home
  15. Hobby (interest) classes during spare time (in order of precedence, at most three items)
  16. Time spent on outdoor activities per day (including activities in and out of kindergarten)
  17. Time spent on watching TV, video and playing video games per day
  18. Types of sports frequently participated (in order of precedence, at most three items)
- (II) Paternal and Maternal Personal Information
1. Date of birth
  2. Community of residence
  3. Years of residence in Macao
  4. Height (cm)
  5. Weight (kg)
  6. Education level
  7. Current occupation
  8. Frequency of sports activities per week
  9. Types of sports frequently participated (in order of precedence, at most three items)
  10. Average duration of sports activities per time
- II. Children and Adolescents (Students) (aged 6~22)
1. Birth place
  2. Community of residence
  3. Diseases diagnosed by doctors within the past 5 years
  4. Diseases experienced (in order of precedence, at most three diseases)
  5. Number of siblings
  6. Birth order among siblings
  7. School attendance
  8. Transportation means to school
  9. Total time spent commuting to and from school per day
  10. Frequency of physical exercise (PE) class per week
  11. Number of sessions used in physical exercise (PE) class each time

12. Perception during PE class
  13. Time spent on outdoor activities during leisure time per day
  14. Time spent on watching TV, video and playing video games per day
  15. Hobby (interest) class during leisure time (in order of precedence, at most three items)
  16. Frequency of doing sports activities during leisure time per week
  17. Types of sports frequently participated during leisure time (in order of precedence, at most three items)
  18. Ball games frequently participated
  19. Average duration of physical exercise per time
  20. Self-perception after physical exercise
  21. Cumulative time spent on homework and lesson revision each day
  22. Average cumulative sleeping hours per day (including naps)
- III. Adults (aged 20~59)
1. Birth place
  2. Community of residence
  3. Education level
  4. Current occupation
  5. Working environment
  6. Diseases diagnosed by doctors within the past 5 years
  7. Diseases experienced (in order of precedence, at most three diseases)
  8. Average working hours per week
  9. Average sleeping hours per day (including naps)
  10. Quality of sleep
  11. Average cumulative walking hours per day
  12. Average sitting time per day
  13. Cigarette consumption
  14. Years of smoking
  15. Alcohol consumption
  16. Frequency of drinking
  17. Types of alcohol frequently consumed
  18. Entertainment activities spent most during leisure time on (in order of precedence, at most three items)
  19. Sport events frequently watched (in order of precedence, at most three items)
  20. Average frequency of sports activities per week

21. Average duration of sports activities each time
22. Duration of persistent exercising
23. Purposes of physical exercise (in order of precedence, at most three items)
24. Types of sports frequently participated (in order of precedence, at most three items)
25. Ball games frequently participated (in order of precedence, at most three items)
26. Locations of physical exercise (in order of precedence, at most three items)
27. Self-perception after physical exercise
28. Main obstacles for participating in physical exercise (in order of precedence, at most three items)
29. Has the subject ever heard of the “Physical Fitness Study”?
30. Has the subject ever participated in the “Physical Fitness Study” before?
31. What does the subject perceive about the “Physical Fitness Study”? (in order of precedence, at most three items)

#### IV. Seniors (aged 60~69)

1. Birth place
2. Community of residence
3. Education level
4. Retirement status
5. Occupation before retirement /current occupation
6. Occupation category before retirement /current occupation category
7. Working environment before retirement/current working environment

Remaining questions were the same as questions 6-24 and 26-31 in adult questionnaire.



2.3.2. Examined Variables

The indexes examined were:

Table 1-1 2010 Indexes examined in Macao citizens

Types	Indexes examined	Young children	Children and adolescents (students)				Adults		Seniors
		3~6 Years old	6~12 years old	13~18 years old	19~22 years old	20~39 years old	40~59 years old	60~69 years old	
Anthropometric	Height	•	•	•	•	•	•	•	
	Sitting height	•	•	•	•	•	•	•	
	Weight	•	•	•	•	•	•	•	
	Chest circumference	•	•	•	•	•	•	•	
	Waist circumference	•	•	•	•	•	•	•	
	Hip circumference	•	•	•	•	•	•	•	
	(Upper arm, inferior angle scapula and abdominal skinfold) Skinfold thickness	•	•	•	•	•	•	•	
	Shoulder width	•	•	•	•	•	•	•	
	Pelvis width	•	•	•	•	•	•	•	
	Foot length	•	•	•	•	•	•	•	
Physiological function	Resting heart rate/ pulse	•	•	•	•	•	•	•	
	Blood pressure		•	•	•	•	•	•	
	Vital capacity		•	•	•	•	•	•	
	Step test					•	•		
Physical fitness	10 m shuttle run	•							
	50 m run		•	•	•				
	50 m x 8 shuttle run		•						
	800 m run(female)			•	•				
	1000 m run(male)			•	•				
	Standing long jump	•	•	•	•				
	Walking on balance beam	•							
	Successive jumps with both feet	•							
	Pull-ups with body inclined (male)		•						
	Pull-ups (male)			•	•				
	Vertical jump		•	•	•	•			
	Grip strength		•	•	•	•	•	•	
	Back strength		•	•	•	•			
	Tennis ball distance throw	•							
	Sit and reach	•	•	•	•	•	•	•	
	One foot stands with eyes closed		•	•	•	•	•	•	
	Respond time		•	•	•	•	•	•	
Push-ups (male)					•				
One-minute sit-ups (female)		•	•	•	•				
Health	Dental decay	•	•	•					
	Eyesight		•	•	•				
	Color vision		•	•	•				

Note: “•” indicated that the index was measured in that age group

## 2.4. Testing Apparatus

Testing apparatus utilized in this study were purchased from Beijing Xindonghua Sports Apparatus Co., Ltd.

**Table 1-2 Products of Testing Apparatus**

No.	Products	No.	Products
1	(Adults) Stadiometer	11	Skinfold caliper
2	RCS-160 electronic digital scale	12	(Children) Stadiometer
3	FCS-1000 digital electronic spirometer	13	(Children) Electronic sit-and-reach measuring apparatus
4	TJY-I digital heart rate monitor, stopwatch (stand-by)	14	Electronic push-up counter
5	WCS-1000 digital grip dynamometer	15	Electronic sit-up counter
6	Digital back dynamometer	16	Balance beam
7	Digital sit-and-reach measuring apparatus	17	Soft packs
8	Vertical jump test mat	18	Electronic standing long jump mat
9	FYS-I electronic selective respond time measuring apparatus		
10	DJZL-I Electronic balance monitor		

Other apparatus included:

Anthropometric measuring tapes, sphygmomanometers, visual chart (eye chart illuminance was about 500 lux), color vision examination chart (People Health Publishing House, edited by Wang Kechang, second edition, 2004), tennis balls, stopwatches, starting flags and single bars.

## 2.5. Testing Methods

Testing methods included two parts: questionnaire and physique index testing which are shown in Appendix 2 and Appendix 3 in Part IV.

## 2.6. Scheduling

To guarantee smooth operation of the study, Macao Sport Development Board and China Institute of Sports Science under the General Administration of Sport of China, started the preparatory work in 2009. In accordance with the characteristics of physical fitness study and the situation in Macao, the study was set into three phases which included the preparatory phase in 2009, the implementation phase in the first half year of 2010, and the result analysis phase in the second half of year 2010 to 2011.

**Table 1-3 Procedures of 2010 physical fitness study Macao SAR Citizens**

Phases	Time	Work contents
Preparatory phase	Jan to Jun, 2009	1. work out study scheme 2. develop work manual 3. purchase testing apparatus
	Jul to Dec, 2009	1. train recruited staff on essential skills (including nationwide training of lead personnel) 2. compile work cards 3. develop entry software 4. determine sampling organizations and numbers
Testing phase	Jan to Jun, 2010	1. examine recruited staff on skills 2. verify sampling units 3. check testing quality 4. perform data entry 5. check data entry 6. calculate statistics
Data (handling) phase	Jul to Dec, 2010	1. compose study report 2. input new data into the Macao citizens physical fitness database
	Jan to Dec, 2011	1. translate study report (English and Portuguese) 2. compose study report 3. translate research report (English and Portuguese)

### 3. Organization and Implementation

#### 3.1. Work Preparation

##### 3.1.1. Establishment of Organizational Network and Leadership

Physical fitness monitoring was a large scale social study which needed understanding, attention and support of various Macao administrative departments in all levels. Therefore, Macao Sport Development Board coordinated with relevant departments to constitute a leading group. At the same time, a physical fitness network was established among sampling organizations and the Physical Fitness Monitor Center for Macao Citizens, thus ensuring a successful implementation of the study.

##### 3.1.2. Determination of Study Contents and Completion of Study Plan

In order to guarantee success and ensure data comparability, Macao Sport Development Board and China Institute of Sports Science under the General Administration of Sport of China adopted the 2005 physical fitness study questionnaire and current Macao situation to determine the study questionnaire contents including physical exercise activities and lifestyles. In addition, study objectives, study subjects, sampling methods, work tasks and procedures were thoroughly planned.

##### 3.1.3. Establishment of Study Teams

In order to guarantee quality of the study, Macao Sport Development Board established three study teams according to work requirements. Examiners were mainly university students from University of Macau, Macao Polytechnic Institute, Macao University of Science and Technology and Kiang Wu Nursing College of Macau. Cultural quality and physical health of the examiners laid the foundation for the successful completion of this study. Two trainings were given to the examiners by the China Institute of Sports Science under the General Administration of Sport of China.

### **3.1.4. Apparatus Preparation**

Macao Sport Development Board adopted Beijing Xin Dong Titan Sports Equipment Co., Ltd., —physical testing equipment of Jianmin - II according to the physical indexes in this study. “Data Register Manual of 2010 Physical Fitness Report of Macao SAR Citizens” and ”Work Manual of 2010 Physical Fitness Report of Macao SAR Citizens” were developed.

### **3.2. Technical Training**

Before the study, the study team was trained by Macao Sport Development Board and the China Institute of Sports Science under the General Administration of Sport of China. Macao Sport Development Board was responsible for the organization and schedule of the study. The China Institute of Sports Science under the General Administration of Sport of China completed the training handbook and was responsible for the teaching of theories and technical skills. Two trainings with approximately 240 participants were scheduled on October 30 to November 3, 2009 and January 15 to January 25, 2010 .

There were two features in the whole training process. The first feature was a grading training, i.e. the training was carried out in different stages according to different work contents. Essential elements were included in the training to prevent the phenomenon of “working on the front and forgetting the back”, thus improved work quality in all stages. The second feature was an innovative style training which combined “class practice first and theory teaching second”, examinations, and questions-and-answers methods.

Training was focused on “work program, contents, and instructions on filling out the questionnaires, physical study procedures, measuring methods of physical indexes and quality control” etc. Finally, a “on the spot examination” was implemented. Examiners were only qualified to participate in the study after training and passing the examination. The examination included theories and practical skills. A “2010 Physical fitness study” training certificate was issued to the examiners who passed the examination.

### **3.3. Data Acquisition**

The on-site data acquisition for the 2010 physical fitness study of Macao SAR Citizens started on January 18, 2010 and ended on April 17, 2010, a total of 3 months. The Study was performed in centralized study sites. During the on-site data acquisition, the study teams conducted the tests in strict accordance with the physical fitness study procedures and methods. The China Institute of Sports Science under the General Administration of Sport of China dispatched key supporting technicians to provide technical guidance. The study teams followed precise standards to implement the tests, checked apparatus and reassessed data to ensure validity.

### **3.4. Data Summarization**

In order to guarantee data summarization quality, China Institute of Sports Science under the General Administration of Sport of China and Macao Sport Development Board established “data verification and entry checking standards”, “data cleaning and checking procedures”, “data entry software validations for 2010 physical fitness study of Macao citizens” and “ data checking logic”.

Data verification, data entry and entry result checking work were completed from April 26-May 31, 2010. All data books were 100% verified to correct suspicious data, errors and overlooked problems. Double data entry method was adopted to complete the data book in order to control error and to lay a solid foundation for improving the efficiency of data entry.

In June 10, 2010, 10326 valid data books were completed after going through the on-site data acquisition and data summarization, a two-stage management system quality control procedure.

## **4. Quality Control**

Quality control assured effectiveness of scientific study results. “2010 Physical fitness study of Macao Citizens” followed strict quality control standards and procedures throughout all aspects of the study to assure quality of the study data.

Quality control was divided into organizational management quality control, procedural quality control and post-study quality control and ran through 2 management systems (testing sites – testing teams - Physical Fitness Monitor Center for Macao Citizens). Re-examination card, table of re-examination error, apparatus checking and maintenance form, and two-times verification procedure were utilized during the whole quality control process.

### **4.1. Quality Control of Organization Management**

The 2010 Physical fitness study of Macao Citizens was a well designed and organized project. All preparations before the study were carried out actively yet prudently, the foundation of success in the study. According to the characteristics of this study, Macao Sport Development Board completed the followings in organizational management:

#### **4.1.1. Organization of Network**

Based on the platform established in 2005, the organizational network of 2010 Physical fitness study of Macao Citizens comprised Physical Fitness Monitor Center for Macao Citizens and other selected departments. Under the leadership of Macao Sport Development Board and with the coordination from relevant departments, the leading team was established and the Physical Fitness Monitor Center for Macao Citizens was set at the Sports Medicine Center of Macao Sport Development Board. Kindergartens, schools, working units and senior centers were randomly selected according to the selection principles. Responsibilities and tasks were determined according to the functional characteristics of each sampling sites, which were mainly as follows:

1) Tasks of the leading team: 1. coordinated work among relevant Macao SAR government departments; 2. led, organized and formulated implementation plan; 3. made important decisions during the Physical fitness study of Macao Citizens.

2) Tasks of the Physical Fitness Monitor Center for Macao Citizens: coordinated with China Institute of Sports Science under the General Administration of Sport of China, 1. formulated work plan and detailed procedures for 2010 Physical fitness study of Macao Citizens; 2. confirmed apparatus needed for

the study; 3. created data book, work manual, and software for data input; 4. trained subjects and examiners; 5. established study team; 6. organized and coordinated study samples; 7. checked, accepted, collected and calculated study results; 8. examined, analyzed and completed the Physical Fitness Report of Macao SAR Citizens and research report etc.; 9. established research group and study team. The research group was made up of technical experts from the Physical Fitness Monitor Center and China Institute of Sports Science under the General Administration of Sport of China.

3) Functions of study sites: 1. coordinated sampling and testing work of the monitor center; 2. organized subjects, confirmed study plan, and managed study sites.

**4.1.2. Establishment and Training of Study Teams**

Three study teams were established by the Physical Fitness Monitor Center for Macao Citizens according to work requirements. Before the study, examiners were trained by the China Institute of Sports Science under the General Administration of Sport of China. The Examiners were only qualified to participate in the study after two trainings, passed an examination and obtained the examiner training certificate for 2010 physical fitness study of Macao SAR Citizens. Every study team member needed to fill out a registration form (table 1-4).

**Table 1-4 “2005 Physical fitness study of Macao Citizens” study team member registration form**  
Study team:

Name	Gender	Age	Work Place	Degree	Major	Study Index/Study Content	Remark

Study team members were divided into three groups based on the “three-fixing principle”, namely study index, apparatus, and study examiner. Detailed requirement and division of work were as follows:

1) Every Study team was divided into five major groups, namely: questionnaire, anthropometrics, physiological function, physical fitness and health group.

2) Every team included 1 captain and at least 25 team members. Notably, at least 4 team members were females, 3 members were in charge of the questionnaire, 2 members were in charge of checking data and 1 professional medical personnel.

3) Tasks: The captain was in charge of organizing, coordinating work and providing technical supervision to the team to assure quality of the study. The professional team was responsible of completing the tests. Weight, waist circumference and skinfold thickness were tested by team members of

the same gender. The checking team was in charge of checking the quality of study location, accepting, sorting and filing the data books. The medical personnel were in charge of all medical services at the study site promptly.

#### 4.1.3. Determination of Subjects and Establishment of Study Sites

The Physical Fitness Monitor Center for Macao Citizens determined the number of subjects and study sites. According to the sample statistics in large-scale social studies and data comparison of information, the number of subjects and sampling methods shall be in accordance with that of 2005 physical fitness study.

In the establishment of the study sites, actual operation was considered and the principle of adherence to original sampling sites was also applied to enhance data comparison. There were a few slight changes in this study:

a) 3~22 age groups: an individual sampling site was added in the adolescent student group to replenish the number of samples (121 others);

b) 20~59 age groups: 3 sampling sites were reduced, namely Naval Office, Menzies Macau Airport Services Ltd., Fishermen Association; whereas 6 sampling sites namely Southeast School, Melco Crown Entertainment Co., Ltd., Bank of China Macao branch, Wing Hang Bank, the Red Cross of Macao Special Administrative Region and the University of Macau were added;

c) 60~69 age groups: 12 sampling sites were reduced: Centro de Convívio do Bairro do Hipódromo, Bairro da Areia Preta e Iao Hon, Centro de Convívio do C.H.T. Patane da UGAM, Centro de Convívio da Associação de Mútuo Auxílio dos Moradores do Sam Pá Mun, Centro para Idosos da Casa Ricci, Centro de Convívio "Hong Nin Chi Ka" da Associação de Agricultores de Macau, Centro de Cuidados Especiais Rejuvenescer, Centro de Lazer e Recreação dos Anciãos da Associação de Beneficência e Assistência Mútua dos Moradores do Bairro "Tai O", Centro de Lazer e Recreação das Associações dos Moradores da Zona Sul de Macau, Centro de Lazer e Recreação dos Anciãos da Associação dos Residentes do Bairro da Praia do Manduco, Associação dos Residentes da Rua 5 de Outubro, Centro de Simiao, Centro do Bairro de Taipa; 9 sampling sites were added: Centro de Convívio Fai Chi Kei, Centro de Convívio "Kei Hong Lok Yuen" do Centro Pastoral da Areia Preta; Centro I Chon da União Geral das Associações dos Moradores de Macau, Associação de Amizade dos Moradores da Zona de Nordeste de Macau, Centro Comunitário de Iao Hon, Centro de Apoio aos Idosos da União Geral das Associações dos Moradores de Macau; Centro de Convívio "Clube de Terceira Idade; União Geral das Associações dos Idosos de Macau; Centro de Serviço aos Empregados da Praça de Ponte e Horta; Macao Polytechnic Institute - Seniors Academy Instituto Politécnico de Macau - Academia do Cidadão Sénior; Associação das Idosas de Fu Lun de Macau; Centro de Dia da Praia do Manduco; and others (individuals aged over 60 years old but working in the adult group sampling sites).

#### 4.1.4. Design of Indexes and Determination of Testing Apparatus

From the perspectives of work requirement, changes in physical fitness of the public and consideration in the continuum of the study, Macao Sport Development Board and China Institute of Sports Science under the General Administration of Sport of China made minor changes on the questionnaires and testing indexes which were based on the 2005 physical fitness study. The changes in the questionnaires were: in order to simplify and represent the information codes of examinees scientifically, “Medical care card number of Macao Department of Health”, “Student card number of Macao Education and Youth Affairs Bureau” in the children and adolescents group were canceled, “Senior center code number” in the seniors group was replaced with “affiliated unit code number”. “Unemployed” and “household duties” choices were added in the “occupation” headline. The choice of “others” in the “ball games frequently participated” headline was added. “Number of session(s) used in physical exercise (PE) class each time” was added in the children and adolescents group as well as “Retirement status” in the senior group. In terms of testing indexes, “hearing” index in the children and adolescents and adults groups was canceled.

Testing apparatus was an important tool to obtain physical fitness study data. Since physical fitness study was a scientific research with strong continuity, in order to better explore the changing physical fitness patterns of the citizens, the consistency of testing apparatus shall be guaranteed, to eliminate data errors due to system variations. Therefore, the 2010 physical fitness study adopted compatible testing apparatus used in 2005 which were products from the same Beijing Xin Dong Titan Sports Equipment Co., Ltd.— physical testing equipment of Jianmin - II)

#### 4.1.5. Study Procedures

Study procedures would be one of the major factors that impact the study quality. Therefore, all study team member must follow the study procedures strictly.

Study procedures were carried out as follows: “**questionnaire – physiological function (and health) – anthropometric measurements - physical fitness**” (figure 1-1).

The study procedures on health, anthropometrics and physical fitness could be carried out interchangeably, but the examination of heart rate (pulse) must be examined first.

Principally speaking, each study team should not have tested more than 200 subjects per working day.

The study team members would collect the registration manuals and performed checking (Refer to **Quality Control during the Study Process**).



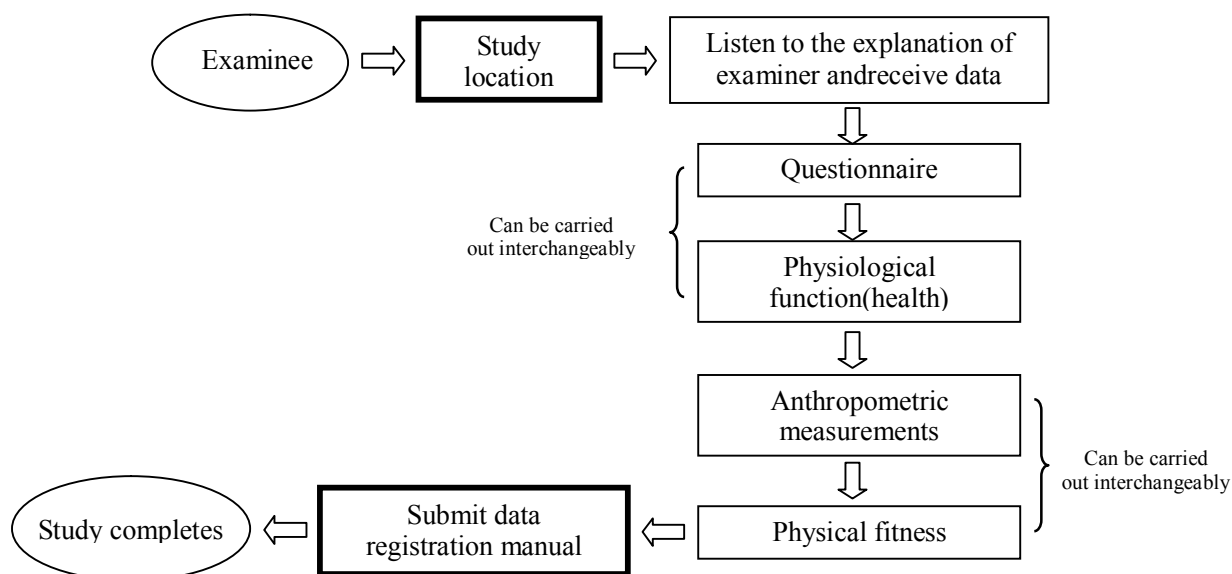


Figure 1-1 Workflow of the study process

## 4.2. Quality Control During the Study Process

The whole study process was divided into 2 parts, preparation for quality control before the study and quality control during the study.

### 4.2.1. Preparation Before Study

Preparation works were mainly the preparation of apparatus and locations.

#### 4.2.1.1. Apparatus preparation and adjustment

Before October 2009, all study apparatus were purchased, assembled, installed, adjusted and attempted for transportation by Macao Sport Development Board. At the same time, consumable goods for the study such as alcohol and disposable mouthpieces were prepared. Some apparatus were adjusted strictly according to the adjustment principles of the apparatus.

- Stadiometer

Study team members checked the stadiometer by using a standard 150 cm steel ruler. First, they placed the “0” point of the steel ruler at the bottom of the stadiometer and placed the steel ruler against the stadiometer. The measure board was then slid down to the top of the steel ruler. The value of the stadiometer and the reading of the steel ruler were compared; a value below 0.1 cm was considered a pass.

- Electronic digital scale

Study team members switched on the scale and waited for it to warm-up. A 10 kg, 20kg and 30 kg standard weight or equivalent object was put onto the scale for calibration. If the value shown on the screen of the scale was the same as the weight, it meant that the apparatus was precise. Afterwards, a 100g standard weight was put on the scale for calibration. If the figure shown on the screen increased by 0.1 kg, it meant that the sensitivity of the scale met the requirement.

- Measuring tape

The measuring tape was compared with a steel ruler, if the error per meter was less than 0.2 cm, the measuring tape could be used.

- Bare L-square

The two angles should meet at the “0” mark. A standard steel ruler was used to check the mark and make sure that the error was less than 0.1 cm.

- Electronic spirometer

Study team members turned on the spirometer and waited for it to be in the working state. Then, the spirometer was checked with a 2000 ml gas-measuring tube. The plunger was pulled to the maximum mark, and was then connected with the spirometer. It was pushed slowly for the gas to enter the spirometer (Figure 1-2). If the value of the spirometer was within  $\pm 40$  ml range of 2000 ml (between 1960 ml and 2040), the spirometer was acceptable.

- Stopwatch

The stopwatch was checked according to Beijing Time. If the stopwatch value was within 0.2 second per minute, the stopwatch was precise and acceptable.

- Sphygmomanometer

The plastic ball, plastic tube and gas valve was checked whether or not it can be used normally.

- Skinfold calipers

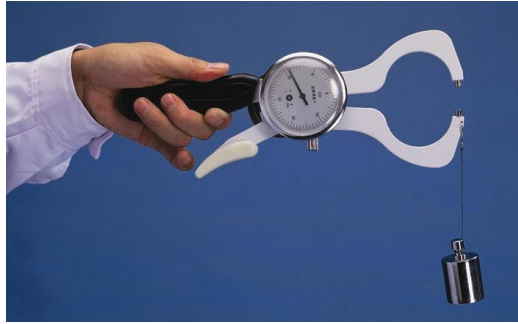
“0” mark was adjusted: The handle of the gauge was squeezed and checked if the needle pointed at the “0” mark. If not, the dial was then turned slowly adjusting it to the “0” mark.

Pressure check: A standard weight of 200 g was hanged on the small hole at the lower part of the caliper. The lower and upper parts of the caliper were leveled for balance. If the pressure was within the range of 15 mm to 25 mm (red area), then the pressure of the caliper met the requirement and there was no need for adjustment. If the pressure was above 25 mm, then pressure was slightly too low. To adjust this, removed the standard weight and turned the dial to the left. If the hand pointed below 15 mm, then the pressure was slightly too high. To adjust this, removed the weight and turned the dial to the right, aimed between the 15 mm and 25 mm range (Figure 1-3).



**Figure 1-2**

**Checking the electronic spirometer**



**Figure 1-3 Checking the skinfold thickness caliper**

#### **4.2.1.2. Study site preparation**

The data acquisition site for this study was set up in the athletic field in Taipa. A space of 100 square meters was used for examinee registration and data entry. Another area of 100 square meters was used for questionnaire. Two rooms of 80 square meters were used for anthropometric measurement for male and female examinees. Two bright and spacious rooms with flat floors about 250 square meters were used as test sites for indoor physiological function and physical fitness, a place ideal for placing study apparatus orderly and controlling the flows of the examinees. Parts of the student physical fitness test were carried out in the 400-meter synthetic track at the athletic field.

All of these preparations provided a strong guarantee for data acquisition.

#### **4.2.2. Quality Control During Study**

##### **4.2.2.1. Requirement for examiners**

- Examiners needed to arrive at the study site 30 minutes in advance to do preparation work, such as checking and calibrating the apparatus.
- Examiners needed to explain the test to the examinee.
- Examiner needed to review the results promptly, in case a re-test was needed.
- Examiner needed to follow all the requirements of the study strictly and could not intentionally amend the content, method or quality of the study.

##### **4.2.2.2. Requirement for examinees**

- Examinees needed to avoid strenuous exercise and heavy labor work 12 hours before the study.
- Examinees needed to keep the study site quiet.
- Examinees needed to be serious and try their best to complete the test.
- Dress code: sportswear and sports shoes. During anthropometrics measuring, examinees were to wear shorts and in addition, female examinees were to wear tank top or short-sleeve shirt.
- Examinees needed to do warm-up and stretching exercise before and after the examination to prevent injury.

- Principally speaking, every examinee was to complete the entire examination in one day. Even under special circumstances, all tests should be completed within one week.

#### **4.2.2.3. Verifying data entry**

Each of the three study teams appointed 2 professional members to be responsible for checking the results of the examination. The checkers should be familiar with the project and be quite diligent.

- **First on-the-spot examination**

1) After the examination, checkers needed to check the classification number, questionnaire and the test results in the data registration manual. Meanwhile, recording method and writing also needed to be checked to ensure clarity. For those who did not meet the requirements, checkers needed to point out immediately to the examiner and corrected it on the spot. During the whole study process, 1365 data were found missing, wrong or suspicious. A make-up examination or re-examination was carried out to make sure that the value was complete, correct and reliable.

2) According to the “Re-examination Reference Book” (See Table 1-5—Table 1-10) requirement, all study results needed to be checked. Anthropometric and physiological function results were found over the range in 160 data registration manuals. If the results were not marked “re-examination” or with possible explanation like “handicapped”, they would be regarded as suspicious and would be re-examined by the original examiner on the spot. After re-examination, 35 wrong items were corrected.

**Table 1-5 Re-examination reference table for young children**

Index	3 years old	4 years old	5 years old	6 years old
Boys				
Resting heart rate (bpm)	70~120	70~120	70~120	70~120
Height (cm)	85~125	90~135	95~140	108~145
Sitting height (cm)	45~70	50~75	53~80	55~85
Weight (kg)	10~25	11~27	13~34	15~40
Chest circumference (cm)	48~60	49~65	51~75	52~80
Upper arm skinfold thickness (mm)	2~30	2~30	2~30	2~30
Subscapular skinfold thickness (mm)	2~30	2~30	2~30	2~30
Abdominal skinfold thickness (mm)	2~30	2~30	2~30	2~30
Sit and reach (cm)	-5~20	-5~20	-5~20	-5~20
10 m shuttle run (sec)	7.0~20.0	6.0~18.0	6.0~15.0	5.0~12.0
Standing long jump (cm)	20~100	30~130	40~150	50~160
Tennis ball distance throw(m)	1.0~8.0	1.0~10.0	2.0~13.0	2.5~16.0
Successive jumps with both feet (sec)	5.0~38.0	4.0~20.0	3.0~15.0	3.0~13.0
Walking on Balance Beam (sec)	5.0~80.0	3.0~70.0	3.0~50.0	2.0~30.0
Girls				
Resting heart rate (bpm)	72~130	70~130	70~120	70~120
Height (cm)	85~120	90~130	95~140	108~145
Sitting height (cm)	45~70	50~79	53~80	55~85
Weight (kg)	10~25	12~28	13~35	15~40
Chest circumference (cm)	40~65	42~70	45~75	48~80
Upper arm skinfold thickness (mm)	2~30	2~30	2~30	2~30
Subscapular skinfold thickness (mm)	2~30	2~30	2~30	2~30
Abdominal skinfold thickness (mm)	2~30	2~30	2~30	2~30
Sit and reach (cm)	-5~20	-5~21	-5~22	-5~22
10 m shuttle run (sec)	7.0~20.0	6.0~18.0	6.0~15.0	5.0~12.0
Standing long jump (cm)	20~100	30~120	40~130	50~140
Tennis ball distance throw(m)	1.0~6.0	2.0~10.0	2.0~12.0	2.0~16.0
Successive jumps with both feet (sec)	5.0~35.0	5.0~20.0	4.0~15.0	4.0~13.0
Walking on Balance Beam (sec)	5.0~100.0	4.0~70.0	3.0~50.0	2.0~30.0

**Table 1-6 "Re-examination Reference table" - physical fitness index for children and adolescents (students)**

Index Age (year)	50 meters (sec)	Pull-ups with body inclined / Pull-ups (times)	sit-ups (times/min)	Sit and reach (cm)	Standing long jump (cm)	50 meters × 8 shuttle run (sec)	800 meters (sec)	1000 meters (sec)
Male								
7-9	14.0~7.7	0~52		-10~24	70~200	160~80		
10-12	12.0~7.1	0~60		-12~26	80~230	140~80		
13-15	11.0~7.0	0~35		-15~28	90~270			360~170
16-18	10.5~6.5	0~35		-12~38	100~290			330~160
19-22	10.0~6.3	0~40		-15~38	110~320			330~150
Female								
7-9	15.0~8.0		4~55	-5~27	65~190	170~85		
10-12	13.0~7.3		6~60	-6~29	75~220	150~80		
13-15	12.0~6.2		8~60	-10~32	85~250		330~150	
16-18	12.0~6.9		2~60	-10~34	95~280		330~140	
19-22	12.0~7.0		2~60	-10~34	100~300		330~140	

**Table 1-7 "Re-examination Reference table" of pulse and blood pressure for children and adolescents (students)**

Age (year)	Male			Female		
	Pulse (times/min)	Systolic pressure (mmHg)	Diastolic pressure (mmHg)	Pulse (times/min)	Systolic pressure (mmHg)	Diastolic pressure (mmHg)
7	72-104	86-112	50-80	72-106	85-112	50-81
8	72-102	87-114	51-81	72-104	86-112	50-81
9	70-100	88-118	51-82	72-104	88-119	51-82
10	68-100	90-120	52-82	72-102	89-121	51-82
11	68-100	88-121	52-82	70-100	90-122	53-82
12	68-98	90-122	54-82	70-100	91-125	56-85
13	66-98	91-126	55-82	70-100	91-126	57-84
14	66-96	92-130	58-86	68-98	91-128	58-85
15	64-96	96-134	60-69	68-98	94-129	57-86
16	64-96	99-137	60-90	66-98	95-130	60-87
17	62-96	100-140	61-91	66-98	95-131	60-87
18	62-96	100-140	61-91	66-96	92-130	60-89
19~22	60-92	100-140	61-91	62-94	92-134	60-90

**Table 1-8 "Re-examination Reference table" of Vital capacity (ml) for children and adolescents (students)**

Age	Male	Female
7	560-2200	500-2000
8	650-2500	600-2300
9	800-2700	700-2500
10	900-2900	770-2800
11	970-3200	850-3000
12	1000-3600	960-3300
13	1100-4300	1100-3700
14	1200-4900	1200-3800
15	1600-5300	1400-3900
16	2000-5600	1500-4000
17	2100-5800	1500-4100
18	2200-5900	1500-4200
19~22	2400-6000	1700-4200

**Table 1-9 "Re-examination Reference table" - Anthropometric Index for children and adolescents (students)**

Age (year)	Male						Female					
	Height (cm)	Weight (kg)	Chest circumference (cm)	Shoulder width (cm)	Pelvis width (cm)	Skinfold thickness (mm)	Height (cm)	Weight (kg)	Chest circumference (cm)	Shoulder width (cm)	Pelvis width (cm)	Skinfold thickness (mm)
7	105-137	13-30	48-67	22-30	16-23	3-24	105-136	12-29	47-65	21-30	16-23	3-25
8	109-142	14-33	49-69	22-31	16-24	3-26	108-142	13-32	47-68	22-31	16-24	3-28
9	113-148	14-37	50-72	23-32	17-24	3-28	113-148	14-36	48-70	23-32	17-24	3-30
10	118-153	15-41	51-57	24-33	17-25	3-30	116-156	15-42	49-74	24-34	17-25	3-32
11	121-160	16-46	52-78	25-35	18-26	3-34	121-164	15-48	50-79	25-36	18-26	3-42
12	123-167	17-52	53-81	25-36	18-27	3-34	126-168	17-54	52-83	26-37	18-27	3-42
13	129-178	19-61	56-87	26-39	19-29	3-34	135-171	23-59	57-87	27-38	19-29	3-49
14	136-183	23-67	59-91	27-41	19-31	3-36	138-172	26-62	60-88	29-39	19-31	3-58
15	144-185	29-71	63-94	29-42	21-31	3-36	140-173	29-64	62-89	29-39	21-31	3-60
16	150-185	34-73	67-95	31-43	22-31	3-36	142-174	31-65	63-90	30-39	22-31	3-62
17	151-187	36-74	70-96	32-43	22-32	3-40	142-174	32-66	64-91	30-39	22-32	3-65
18	152-187	38-75	71-97	32-43	22-32	3-40	142-174	32-67	65-91	30-39	22-32	3-65
19~22	153-187	40-76	73-98	33-44	22-32	3-40	142-175	33-67	65-92	30-40	22-32	3-65

**Table 1-10 “Re-examination Reference table” - adults and seniors**

Index	Male		Female	
	Under 39 years old	Over 40 years old	Under 39 years old	Over 40 years old
Resting heart rate (bpm)	50~120	50~120	50~120	50~120
Systolic pressure (mmHg)	90~180	90~180	80~180	80~180
Diastolic pressure (mmHg)	50~100	60~100	50~100	55~100
Height (cm)	140~200	140~200	140~190	140~190
Weight (kg)	35~110	35~110	35~90	35~95
Chest circumference (cm)	60~120	60~120	60~120	60~120
Waist circumference (cm)	60~120	63~120	56~120	59~120
Hip circumference (cm)	70~120	70~120	70~120	75~120
Upper arm skinfold thickness (mm)	2~60	2~60	2~60	2~60
Subscapular skinfold thickness (mm)	2~60	2~60	2~60	2~65
Abdominal skinfold thickness (mm)	2~60	2~65	2~65	2~70
Vital capacity (ml)	1000~7000	1000~6000	800~6000	800~5000
One-minute heart rate (times)	30~90	30~90	30~90	30~90
Two-minute heart rate (times)	30~80	30~80	30~80	30~80
Three-minute heart rate (times)	30~70	30~70	30~70	30~70
Exercising time (sec)	60~180	60~180	60~180	60~180
Grip strength (kg)	20~80	20~80	15~60	15~60
Sit and reach (cm)	-15~26	-15~26	-10~30	-11~30
Vertical jump (cm)	15~75		10~70	
Back strength (kg)	30~220		20~150	
push-ups(times)	0~50			
One minute sit-ups (times/min)			0~60	
One foot stands with eyes Closed (sec)	2~150		2~150	
Selective respond time (sec)	0.220~0.90	0.30~2.00	0.22~0.90	0.30~2.00



3) Physical fitness indexes in 56 data registration manuals were beyond the “Re-examination Reference Table” references and were checked logically according to other relevant indexes to eliminate doubts and prevent incorrect recordings. Two undetermined data registration manuals were rejected.

- **Random re-examination check**

- 1) Method of re-examination

Checkers randomly picked 5 % of total examinees each day to re-examine the anthropometric indexes and checked for errors. Detailed procedures were as follows:

- ◆ The data registration manual was collected and a re-examination card was issued (see table 1-11). The original examiner would re-examine all the anthropometric indexes following the original examination procedures and methods.

- ◆ After re-examination, the examinee would submit the re-examination card to the checker and the checker would fill in the original results from the data registration manual into the re-examination card (to be done carefully). The checker would return the data registration manual to the examinee and the examinee would complete the remaining indexes.

- ◆ Checkers and captain of the study team would check errors together. The original index minus the re-examination index equaled to the error of the two tests. The number of errors beyond acceptable functional indexes error range was recorded (**See Acceptable range of error for anthropometric index**).

- ◆ Checkers were to calculate the occurrence rate of re-examination error exceeding the acceptable range once every three days and recorded in the table of re-examination errors (table 1-12). Error occurrence rate was calculated using the following formula:

$$P = \frac{\sum n}{AN}$$

In the formula,  $\sum n$  means the total frequency of re-examination error exceeding the acceptable range. “A” means the total number of figure indexes in each re-examination card. N means the number of re-examination card (number of examinees who are picked randomly to be re-examined).

**Table 1-11 Re-examination card**

Name \_\_\_\_\_ Gender \_\_\_\_\_ Age \_\_\_\_\_ Work Place \_\_\_\_\_

**Type of sample: please mark “√” on your type**

Young children	Primary school students	Secondary school students	College Students	Labor intensive adults	Non-labor intensive adults	Seniors

1. Examination Date \_\_\_\_\_ 2. Date of Birth \_\_\_\_\_  
 3. Community \_\_\_\_\_ 4. Examination Number \_\_\_\_\_

Index	Original value	Re-examination value	Balance (Original-re-examination)	Beyond the acceptable error range (Y/N)
Height (cm)				
Sitting height (cm)				
Weight (kg)				
Chest circumference (cm)				
Waist circumference (cm)				
Hip circumference (cm)				
Upper arm skinfold thickness (mm)				
Subscapular skinfold thickness (mm)				
Abdominal skinfold thickness (mm)				
Shoulder width (cm)				
Pelvis width (cm)				
Foot length (cm)				
Total				

**Table 1-12 Table of Re-examination Errors**

\_\_\_\_\_ Study team

Date of Examination	Total studied subjects	Re-examinees	Error occurrence rate	Signature
Total				

2) Standard of re-examination check

■ Day of examination

During the day of examination, if the error of one anthropometric index was found to be beyond the acceptable range, the checker should examine it with the examiners immediately to find out the reasons and amending methods. Examination methods should be amended promptly to meet the requirements and such index should be re-examined on all examinees.

■ Within three days of examination

If the error occurrence rate was larger than 5 % within three days of the examination, checkers should detect the reasons and find a solution immediately. Unqualified examiners needed to be re-trained and passed the test again in order to return to their position. If the occurrence rate was larger than 10 %, all indexes would be invalid. All examinees should be re-organized and their anthropometric index be re-examined .

3)Acceptable range of error for anthropometric index

**Height : ±0.5 cm ; Sitting height : ±0.5 cm ; Weight : ±0.1 kg ; Chest, waist and hip circumference : ±1.0 cm ; Skinfold thickness : ±2.0 mm ; Shoulder, pelvis width : ±0.5 cm ; Foot length : ±0.2 cm.**

In the whole study process, the re-examination rate was 5.6 %, error occurrence rate was 2.1%, and both met the quality control standard.

**4.2.2.4. Apparatus checking and maintenance**

The apparatus used for anthropometric test and physical capability test needed to be properly checked before the beginning of each examination. If any apparatus was beyond the acceptable range, they should be calibrated, maintained or changed in time. The Apparatus Checking and Maintenance form was to be filled out (table 1-13).

**Table 1-13 Apparatus Checking and Maintenance Form**

				Study team
Checking Time	Name of Apparatus	Error	Treatment	Signature

Throughout the whole study, apparatus checking was performed 30 times. 1 step test apparatus,1 electronic back dynamometer, 2 test apparatus for one foot stands, 1 electronic digital scale and 4 skinfold calipers were changed.

**4.3. Quality Control After Examination**

This period referred to quality control from the date of data summarization to establishment of original database. This part included checking and verifying data entry and results on the data registration manuals.

**4.3.1. Checking of Data Registration Manual**

Upon completion of examinations, each study team allocated members to classify and check the data registration manual. Detailed contents were as follows:

◆ Ensured validity of the data registration manual: If a category of indexes or three data indexes were invalid, the manual would be regarded as unqualified. Manuals that contained data which could not be confirmed, re-done or re-examined should be left out. 120 data registration manuals were confirmed unqualified, 3 were left out (including data books: M2096 in adolescent student group, M113 in adult group and F159 in senior group), and the final qualified rate was 99.97%.

◆ Filled the Checking Table for Data Registration Manual (table 1-14).

◆ Filled the Classification Table for Data Registration Manual (table 1-15).

**Table 1-14      Checking Table for Data Registration Manual**

Group	Total number of manuals	Total unqualified books	Study team	
			Present manuals	Qualified Rate
3~6	1065	0	1065	100%
6~22	5132	1	5131	99.98%
20~39	1609	0	1609	100%
40~59	1932	1	1931	99.94%
60~69	592	1	591	99.83%
<b>Total</b>	10330	3	10327	99.97%

Note: Present manuals = Total number of manuals – Unqualified manuals

Qualified Rate = (Present manuals / Total number of manuals) x100%

**Table 1-15 Classification Table for Card of 2010 Physical fitness study of Macao Citizens**  
**Study team: Target of Study:**

<b>Group</b>	<b>Male</b>	<b>Female</b>	<b>Sub-total</b>	<b>Remark</b>
3	193	102	295	
4	185	117	302	
5	189	107	296	
6	98	74	172	
<b>Sub-total</b>	<b>665</b>	<b>400</b>	<b>1065</b>	
6	104	94	198	
7	201	159	360	
8	172	146	318	
9	202	155	357	
10	173	147	320	
11	149	151	300	
12	196	175	371	
13	185	159	344	
14	162	176	338	
15	188	169	357	
16	162	187	349	
17	186	203	389	
18	143	186	329	
19	102	128	230	
20	97	99	196	
21	95	100	195	
22	87	93	180	
<b>Sub-total</b>	<b>2604</b>	<b>2527</b>	<b>5131</b>	
20~24	187	196	383	
25~29	201	209	410	
30~34	195	200	395	
35~39	189	232	421	
<b>Sub-total</b>	<b>772</b>	<b>837</b>	<b>1609</b>	
40~44	178	261	439	
45~49	199	317	516	
50~54	219	340	559	
55~59	193	224	417	
<b>Sub-total</b>	<b>789</b>	<b>1142</b>	<b>1931</b>	
60~64	109	262	371	
65~69	94	126	220	
<b>Sub-total</b>	<b>203</b>	<b>388</b>	<b>591</b>	
<b>Total</b>	<b>5033</b>	<b>5294</b>	<b>10327</b>	

**4.3.2. Examination of Data Registration Manual**

In order to guarantee accuracy and reliability of the study results, Physical Fitness Monitor Center for Macao Citizens randomly chose data registration manuals and tables to examine.

Detailed methods were as follows:

Firstly, checked whether the data registration manuals were classified by type, gender, and age; and whether the number of each age group met the required quantity.

Secondly, randomly chose 2 % (about 200) of all the data registration manuals for examination and verification according to the systematic sampling method.

Method of choosing data registration manuals: Arranged data registration manuals in the order from young to senior and from male to female according to young children, primary and secondary school students, university students, adults and seniors groups. Chose data registration manuals from young children group first, determined the starting point randomly and chose 1 in every 48 data registration manuals with a total of 18 registration manuals. Secondly, chose data registration manuals from children adolescents (primary and secondary school students) group, determined the starting point randomly, and chose 1 in every 49 data books with a total of 86 books. Thirdly, chose data registration manuals from the university students group, chose 1 in every 49 data registration manuals with a total of 17 registration manuals. Fourthly, chose 1 in every 49 data books from the adults group with a total of 68 registration manuals. Finally, chose 1 in every 47 data books in the seniors group with a total of 9 books.

Contents of examination: Firstly, checked whether the classification codes were filed clearly and completely. Secondly, checked whether items were omitted and logical errors existed according to the order of the questionnaire contents. Lastly, checked whether there were missing examined indexes.

Examination standards and treatment methods: classified and corrected on the spot any data registration manuals with problems. If unqualified registration manuals were above 5% of the total, all data registration manuals of the same team would be re-classified and re-checked. Logical reasoning or re-examination by the original team could be done on individual data registration manuals with suspicious figures. If any suspicious figure could not be confirmed, the registration manuals would be discarded and not be entered into the computer.

Examination results: Through examining the data registration manuals, main problems found in the questionnaire part were logical contradictions in “education level” and “occupation”, “with or without diseases” and “types of diseases”, “smoking, drinking” and “current conditions of smoking and drinking”, “physical exercise participation” and “conditions on physical exercise”; and the logical contradictions in the examined index part were “among the three circumferences”, “among weight, vertical jump and grip strength” as well as “decreasing heart rate in step index”. There were 700 suspicious items totally. Correction on the spot and deletion of data registration manuals with over 3 suspicious items was carried out by experts at the Physical Fitness Monitor Center for Macao Citizens promptly, 1 data book was discarded.

### **4.3.3. Data Entry**

Data entry was done by double input and checked by the computer automatically. The whole entry started on April 1, 2010 and ended on May 25, 2010, lasting 2 months. “Responsibility system” was established, i.e. each checker was in charge of one age group’s data registration manuals, and each data registration manual entry should be completed simultaneously.

Entry result standard: The data entry error rate needed to be controlled below 0.05 %. If error rate exceeded 0.05 %, entry must be stopped, deleted and re-entered. The responsible staff could not resume the position until he was re-qualified after training.

#### **4.3.4. Checking of Entry Results**

3 % of all the data registration manuals were chosen randomly for the checking of entry results. Data registration manuals entered by the entry clerk were considered as one sample unit in random checking. According to the systematic sampling, 27 data registration manuals were chosen from young children group, 129 from children and adolescents group, 26 from university students group, 101 from adults group and 13 from seniors group. The selected questionnaires were manually checked. The selections covered checking the entry results of each entry clerk and both genders in each age group.

##### **4.3.4.1. Manual checking**

Consistency check was carried out on the electronic data entered according to the data registration manuals with the results of the original data registration manuals. If the two values did not correlate with each other, the value in the database was amended based on the data registration manuals.

##### **4.3.4.2. Logic testing**

Checking programs were set to automatically print out results that were above re-examination range. Checkers would search for suspicious values with the original data registration manuals. If it was too difficult to judge, the suspicious value was left out.

From May 25 to 29, 2010, technicians of the China Institute of Sports Science under the General Administration of Sport of China and the staff of Physical Fitness Monitor Center for Macao Citizens performed the checking. Entry error rate was 0.023 %, reaching the specified quality standard. The errors were mainly entry errors of numbers, such as “8”-“0”, “0”-“6”, “19820102”-“19821002”. The experts corrected about 152 manual check errors and logic test error characters.

#### **4.3.5. Database Establishment**

The establishment of an original database needed repeated filtering and examination by researchers on the validity and scientificity of the data registration manuals. Therefore, prior to establishing the database, careful logic checking was carried out by Macao Sport Development Board and China Institute of Sports Science under the General Administration of Sport of China. Finally, 4 questionnaires were voided and a total of 10326 samples were included in the original database.

## 5. Data Handling

The original data of this study came from the questionnaires and examined physique indexes. To ensure the quality of the data and reduce discrepancy in analysis, data analysis was handled in two steps: firstly, the data was organized and checked. Secondly, data was analyzed statistically.

### 5.1. Data Cleaning

Using the established Access database, the logic between various indexes was screened with SQL editor or SPSS. Indexes in the “2000 National Physical Health Survey Report”, the “Scientific and Technological Achievements Report” and logic relationship among indexes were used as reference-value in the screening process.

Data was checked against the data registration manuals and corrected when the data was beyond the reference-value range (table 1-16-table 1-23). If the data was still not correct, phone calls to the subjects were made to confirm and amend. If data was correctly registered, it would remain as it was (figure 1-4).

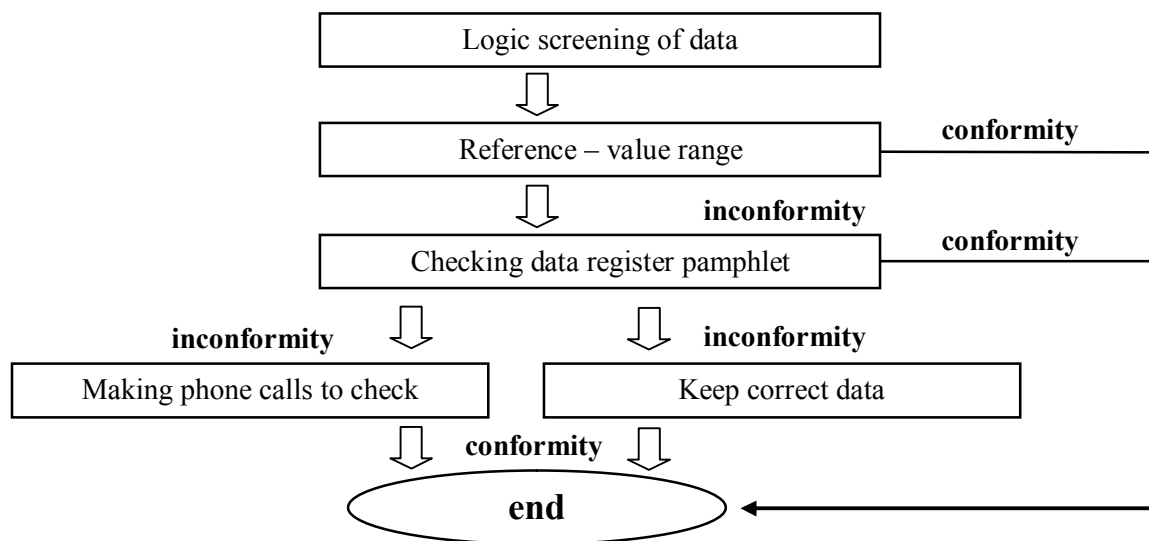


Figure 1-4 Data organizing and checking workflow

The numbers of samples in the database after data cleaning were 10323, 3 samples less than the original database and sample clearance rate was 0.0290%. 67 data items were deleted, data item clearance rate was 0.073% and there were 877163 valid data items.



**Table 1-16 Reference-value range for children aged 3-6 years old (boys)**

Index	3 years old	4 years old	5 years old	6 years old
Height(cm)	89.0~110.0	95.0~115.7	100.2~122.3	104.5~127.0
Weight (kg)	12.1~19.8	13.4~22.4	14.6~25.8	15.8~28.0
Quitelet index	130.7~189.9	135.4~200.0	140.7~219.0	145.8~229.8
Sitting height(cm)	50.5~63.0	54.0~66.0	56.5~68.9	58.0~70.5
Sitting height index	52.7~61.1	53.0~60.1	53.1~59.4	52.3~58.7
Chest circumference(cm)	46.6~58.0	48.0~59.2	50.0~62.0	50.0~64.0
Chest circumference index	46.5~58.3	45.4~56.3	44.5~55.2	43.7~54.4
Upper arm skinfold thickness (mm)	4.0~16.0	4.0~16.0	4.0~16.5	4.0~17.0
Subscapular skinfold thickness(mm)	3.5~12.0	3.5~12.0	3.5~13.0	3.5~12.5
Abdominal skinfold thickness (mm)	3.0~13.4	3.0~15.0	3.0~16.5	3.0~16.0
Sum of skinfold thickness (mm)	12.5~39.5	12.5~41.0	12.0~44.5	11.5~43.3
Resting heart rate(bpm)	75~120	75~120	75~120	75~120
Standing long jump (cm)	24~95	38~110	52~127	61~140
Tennis ball distance throw(m)	1.5~7.3	2.0~9.6	3.0~12.0	3.8~15.0
Sit and reach(cm)	2.6~17.0	2.0~17.0	1.0~17.0	1.0~17.0
10 m shuttle run(sec)	7.0~15.0	6.3~12.1	6.0~10.2	5.6~9.4
Moving forward on balance beam (sec)	4.7~45.0	3.5~31.2	2.8~21.2	2.3~14.8
Moving sidelong on balance beam (sec)	11.0~62.0	8.6~57.8	4.6~47.1	3.6~30.1
Successive jumps with both feet(sec)	5.4~24.0	4.7~15.9	4.4~12.1	4.1~10.4

**Table 1-17 Reference-value range for children aged 3~6 years old (girls)**

Index	3 years old	4 years old	5 years old	6 years old
Height(cm)	88.0~108.3	94.1~114.5	99.4~121.0	103.4~125.3
Weight (kg)	11.6~19.1	12.9~21.6	14.1~24.1	15.1~26.0
Quitelet index	126.5~184.7	131.8~197.2	136.8~205.6	140.1~215.6
Sitting height(cm)	50.0~62.1	53.0~65.0	56.0~67.8	57.7~69.6
Sitting height index	52.7~61.0	52.8~60.0	53.0~59.1	52.4~58.8
Chest circumference(cm)	45.0~57.0	46.5~58.0	48.0~60.0	49.0~62.0
Chest circumference index	45.7~57.8	44.6~55.6	43.4~54.2	42.6~53.6
Upper arm skinfold thickness (mm)	4.0~17.5	4.0~17.0	4.0~17.0	4.0~17.0
Subscapular skinfold thickness(mm)	3.5~13.0	4.0~13.0	4.0~14.0	3.8~13.5
Abdominal skinfold thickness (mm)	3.5~15.0	3.5~16.0	3.0~16.5	3.5~17.0
Sum of skinfold thickness (mm)	12.5~42.5	13.5~44.0	13.0~45.5	12.5~44.5
Resting heart rate(bpm)	75~120	75~120	75~120	75~120
Standing long jump (cm)	23~90	35~103	50~117	60~127
Tennis ball distance throw(m)	1.5~6.0	2.0~7.5	2.5~9.0	3.0~10.5
Sit and reach(cm)	3.0~18.0	3.2~18.0	2.9~18.8	3.0~19.0
10 m shuttle run(sec)	7.2~15.8	6.5~12.9	6.1~11.0	5.9~10.2
Moving forward on balance beam (sec)	4.9~45.9	4.0~32.1	3.0~20.5	2.6~16.0
Moving sidelong on balance beam (sec)	10.0~80.3	8.3~59.0	6.4~55.2	4.6~52.9
Successive jumps with both feet(sec)	5.5~24.2	5.0~16.2	4.5~12.1	4.3~10.5

Table 1-18 Reference-value range for students aged 6~22 (physiological functions)

Gender	Age (year)	Pulse (times/min)	Systolic pressure(mmHg)	Diastolic pressure(mmHg)	Vital capacity(ml)	
Male	6	72~116	70~110	42~70	781~1684	
	7	72~115	74~110	43~71	857~1940	
	8	69~116	72~110	40~72	1058~2136	
	9	70~115	76~118	46~76	1144~2392	
	10	70~107	80~123	46~79	1314~2707	
	11	64~112	84~124	50~80	1560~3005	
	12	70~118	84~127	49~80	1700~3709	
	13	67~108	90~136	50~82	1944~4332	
	14	67~102	90~140	50~80	2047~4737	
	15	64~114	92~140	52~89	2601~5174	
	16	64~110	94~140	54~84	2717~5479	
	17	60~108	92~140	58~84	2871~5345	
	18	63~103	93~140	57~86	2774~5263	
	19	60~104	96~138	54~86	2870~6005	
	20	60~104	96~141	60~84	3122~5886	
	21	60~99	98~130	54~85	3150~5820	
	22	61~90	100~130	60~83	3222~5449	
	Female	6	70~115	69~104	42~67	637~1515
		7	68~120	72~104	44~70	875~1614
		8	69~117	72~114	40~68	924~1944
		9	70~117	80~114	42~76	1130~2210
		10	69~120	79~124	48~80	1069~2582
11		68~116	81~124	47~81	1376~2862	
12		68~116	86~126	51~81	1467~3019	
13		70~110	88~132	52~82	1680~3350	
14		70~112	90~128	52~81	1701~3229	
15		68~110	90~128	55~84	1940~3708	
16		64~110	90~130	54~82	1908~3795	
17		68~110	88~126	55~84	2021~3637	
18		64~102	87~124	53~83	2098~3675	
19		64~105	89~124	54~84	1845~4165	
20		64~110	80~130	50~85	1810~3980	
21		62~100	80~120	50~84	2012~4054	
22		63~97	75~123	50~87	1993~4126	

Table 1-19 Reference-value range for students aged 6~22 (anthropometrics)

Gender	Age (year)	Height (cm)	Sitting height (cm)	Weight (kg)	Chest circumference (cm)	Waist circumference (cm)	Hip circumference (cm)	
Male	6	110.7~126.8	60.2~69.9	16.7~31.3	51.9~68.4	46.4~67.2	52.8~72.4	
	7	113.4~135.3	61.5~72.4	17.6~38.7	53.0~74.1	47.1~73.6	54.6~79.3	
	8	118.3~139.9	63.8~75.0	19.3~44.2	55.2~77.3	48.0~77.0	57.0~81.4	
	9	123.8~145.8	66.3~76.9	22.9~50.3	57.3~83.9	50.4~83.4	60.7~86.1	
	10	128.5~152.9	67.9~79.7	23.9~52.6	58.2~84.5	51.0~83.2	61.9~87.0	
	11	131.2~159.8	68.9~83.8	26.5~61.5	61.5~88.1	54.0~89.2	64.7~92.6	
	12	136.8~168.8	71.9~88.5	29.6~69.6	62.8~93.9	54.5~93.4	65.7~98.4	
	13	145.4~175.3	74.5~93.0	32.5~74.7	63.7~94.8	54.5~93.9	67.6~101.0	
	14	152.9~179.4	79.8~94.2	39.1~83.6	67.1~97.5	56.7~96.0	73.6~105.7	
	15	157.5~180.9	82.6~95.6	41.9~82.2	70.9~98.3	59.9~92.1	76.6~101.0	
	16	160.4~184.6	85.9~96.2	43.4~83.1	72.7~98.4	59.6~92.4	78.1~102.8	
	17	160.6~182.4	85.3~98.2	44.4~88.6	73.2~102.9	60.7~101.7	78.6~107.0	
	18	160.2~182.5	86.0~97.0	45.6~82.1	74.9~99.1	61.7~93.7	78.5~104.2	
	19	159.3~181.5	86.3~97.4	46.9~86.5	77.5~98.5	63.2~94.7	79.2~105.6	
	20	158.5~183.4	86.4~98.1	46.6~82.8	74.8~101.7	59.7~90.3	80.7~101.6	
	21	162.8~182.9	85.7~97.5	47.4~83.9	76.0~98.9	62.3~91.8	79.2~99.8	
	22	160.1~179.0	85.9~96.3	49.1~82.3	77.6~100.9	64.0~93.1	81.6~98.8	
	Female	6	108.5~127.6	59.4~70.4	16.7~28.2	51.4~66.7	45.6~62.5	53.3~69.6
		7	113.3~132.7	62.6~71.8	18.3~37.2	52.0~76.9	46.5~71.2	56.1~76.9
		8	114.4~139.0	63.2~74.0	18.3~39.2	53.3~74.9	46.9~73.9	55.9~79.7
		9	124.5~148.9	65.9~79.6	21.4~49.0	55.0~82.3	48.0~75.8	60.2~85.5
		10	129.4~153.9	68.3~82.7	23.8~55.5	57.5~85.0	50.0~80.4	60.8~89.7
11		137.5~159.8	71.6~84.4	26.6~56.5	58.8~87.4	52.0~84.4	66.3~93.7	
12		141.6~162.9	73.6~87.7	30.9~60.8	64.3~91.5	55.0~81.9	70.6~96.6	
13		144.5~167.1	76.2~88.7	34.3~72.4	66.0~94.7	54.8~87.0	72.9~103.4	
14		144.4~167.4	77.3~88.9	35.1~65.0	68.0~92.5	55.8~85.6	74.5~104.3	
15		147.8~167.9	79.8~90.7	36.9~67.6	69.4~92.3	56.8~82.4	78.0~99.5	
16		147~169.7	79.3~91.7	39.9~71.4	71.7~94.8	57.7~81.6	79.5~104.2	
17		148.4~166.5	80.2~90.4	37.2~69.1	71.0~94.9	57.5~85.2	79.2~103.0	
18		147.6~168.3	80.5~90.9	37.5~63.1	71.2~89.0	57.2~79.8	79.4~99.3	
19		148.4~168.3	79.8~90.5	39.0~71.0	70.8~92.5	56.7~84.6	80.0~99.8	
20		146.3~169.2	80.5~91.2	38.7~64.9	72.3~92.3	57.3~80.0	79.3~98.5	
21		147.0~169.6	80.9~90.6	40.0~60.4	71.3~87.8	57.0~78.8	79.9~96.7	
22		148.9~166.1	81.3~90.9	36.5~64.6	70.8~90.0	56.1~80.5	78.2~97.2	

**Table 1-20 Reference-value range for students aged 6~22 (anthropometrics)**

Gender	Age (year)	Skinfold thickness (mm)			Shoulder width (cm)	Pelvis width (cm)	Foot length (cm)	
		Upper arm	Subscapular	Abdominal				
Male	6	4.5~19.8	3.5~17.0	3.0~24.6	23.5~28.5	17.0~20.6	16.5~20.2	
	7	5.0~23.0	4.0~26.0	3.4~28.9	24.3~30.1	17.3~22.3	17.0~21.1	
	8	5.0~27.5	4.0~27.0	3.5~33.1	25.4~30.5	17.6~22.3	17.5~21.8	
	9	5.0~29.0	4.0~29.3	4.0~33.7	26.5~32.6	18.2~24.1	18.9~23.0	
	10	5.5~29.7	4.5~30.7	4.0~37.0	27.0~34.0	18.9~24.9	19.3~23.9	
	11	5.7~30.0	5.0~33.0	4.5~38.7	28.3~35.7	20.0~26.4	20.1~25.3	
	12	5.5~31.3	5.0~38.0	4.0~44.8	29.1~37.3	20.6~27.3	20.7~26.4	
	13	5.0~30.5	5.0~33.5	4.2~44.0	30.6~40.0	21.4~28.7	21.8~26.6	
	14	5.0~28.5	5.5~28.7	5.0~41.2	32.3~40.0	22.5~29.7	22.8~27.3	
	15	4.7~27.9	5.5~29.3	4.7~37.5	34.4~41.1	23.5~29.5	22.9~27.7	
	16	5.0~24.6	6.1~28.0	4.6~40.5	33.6~41.7	23.8~29.5	23.0~27.3	
	17	5.0~24.4	5.5~31.0	5.0~39.0	33.6~41.9	23.8~30.0	22.7~27.3	
	18	4.5~25.0	6.5~27.1	5.0~40.6	34.7~42.1	24.0~30.2	22.6~26.7	
	19	4.5~24.7	6.5~35.7	5.0~39.3	35.4~42.6	24.3~30.5	22.6~27.9	
	20	4.5~24.0	6.0~32.6	5.0~42.6	35.8~41.8	24.8~30.4	22.7~27.2	
	21	4.5~23.0	6.5~26.0	5.0~41.0	36.5~42.8	25.0~30.2	23.7~27.9	
	22	4.5~28.3	7.0~28.5	4.5~46.6	36.8~41.7	25.9~30.3	23.3~26.1	
	Female	6	5.6~18.4	4.4~18.7	3.9~21.3	22.6~27.5	15.9~23.0	16.3~20.0
		7	5.5~21.6	4.3~23.4	4.2~28.0	23.5~29.7	16.5~22.7	17.1~21.1
		8	6.2~23.1	4.7~24.7	4.5~28.7	23.9~29.9	16.7~22.2	17.2~21.7
		9	6.3~26.4	5.1~30.9	5.0~32.5	25.3~32.0	18.0~24.4	18.5~23.3
		10	7.0~24.8	5.1~30.2	5.2~33.1	26.5~33.7	18.7~25.9	19.4~23.8
11		6.4~25.5	6.0~34.2	6.4~33.6	28.0~34.8	19.6~26.4	20.4~24.3	
12		6.9~26.4	6.5~28.2	7.1~36.6	29.0~36.3	21.0~26.9	20.7~24.4	
13		7.5~32.0	7.5~35.5	9.5~41.0	30.5~36.7	22.2~28.0	20.6~24.8	
14		8.4~29.5	8.0~32.2	10.8~38.7	30.2~36.6	22.0~28.0	20.7~24.6	
15		10.0~27.5	8.4~32.0	12.5~42.0	31.0~37.2	22.7~28.2	21.0~25.2	
16		8.4~26.6	8.8~33.5	10.4~42.6	31.1~37.3	23.2~28.6	21.0~24.5	
17		8.2~28.5	8.7~35.9	10.1~41.1	31.6~37.2	23.2~28.5	21.1~24.5	
18		9.3~28.0	8.5~35.1	11.2~37.0	31.2~37.3	22.7~29.1	20.7~24.7	
19		9.9~27.2	9.1~37.0	9.9~33.3	30.6~37.6	23.1~28.6	21.0~24.6	
20		8.5~31.2	8.8~37.0	9.0~39.0	31.1~37.2	22.5~28.4	20.5~24.7	
21		9.5~26.4	9.5~36.0	8.6~31.4	31.8~38.1	22.9~28.9	21.1~24.2	
22		8.6~26.6	9.5~8.0	8.3~32.8	31.7~38.0	23.2~28.9	20.8~24.2	

Table 1-21 Reference-value range for students aged 6~22 (physical fitness)

Gender	Age (year)	Standing long jump (cm)	Vertical jump (cm)	Grip strength (kg)	Back strength (kg)	Sit and reach (cm)	
Male	6	71.0~129.8	13.2~27.8	4.4~11.8	16.3~41.8	-6.9~13.7	
	7	80.0~145.3	13.7~29.5	5.5~15.5	15.0~47.3	-9.1~13.2	
	8	90.9~155.0	15.2~29.7	6.8~15.0	18.9~55.1	-6.5~12.3	
	9	92.0~169.2	16.8~35.3	8.6~19.2	24.0~63.2	-8.7~12.8	
	10	87.6~168.0	15.3~34.1	9.2~21.5	21.6~68.0	-12.0~11.7	
	11	104.3~183.4	18.2~37.8	10.8~25.9	28.3~84.7	-14.0~11.5	
	12	110.0~195.0	17.8~39.1	13.5~32.9	35.0~99.0	-12.2~11.8	
	13	127.5~216.0	21.6~43.9	15.8~37.6	43.0~107.1	-11.8~15.4	
	14	133.6~221.0	21.9~49.4	18.2~45.5	51.0~120.9	-15.3~17.8	
	15	139.6~254.4	25.7~56.0	24.1~45.3	59.0~132.2	-13.7~22.8	
	16	140.8~247.5	26.5~53.4	24.3~49.3	67.8~145.8	-11.3~21.9	
	17	146.3~253.0	26.1~56.1	24.4~51.7	65.1~149.8	-11.7~23.9	
	18	137.8~260.0	26.7~57.8	26.5~54.2	72.0~156.2	-14.3~24.8	
	19	144.6~265.0	25.4~56.8	27.1~54.6	77.0~155.7	-10.8~24.1	
	20	142.5~250.0	29.3~54.2	29.7~54.6	70.1~160.8	-10.3~23.9	
	21	148.0~256.0	31.7~54.2	28.3~54.3	75.0~176.0	-13.4~22.6	
	22	160.0~252.5	29.4~54.6	30.0~49.7	65.8~146.6	-8.6~12.7	
	Female	6	64.0~122.3	12.6~24.9	3.1~12	11.0~40.3	-4.3~17.6
		7	74.2~131.9	13.1~26.3	4~12.7	12.1~42.9	-5.9~16.5
		8	86.0~141.4	14.3~29.1	6~15.1	16.6~49.0	-2.1~18.4
		9	88.1~147.8	14.1~28.7	7.3~18.2	20.0~58.0	-8.9~16.0
		10	96.9~153.2	16.8~29.6	8.7~20.4	20.0~60.1	-6.7~16.1
11		100.0~172.0	18.5~32.2	11.5~24.1	20.0~70.4	-8.7~18.4	
12		96.0~170.0	16.8~35.2	13.5~26.7	27.3~72.5	-7.7~18.6	
13		99.0~177.0	14.5~33.7	14.8~29.2	31.0~77.0	-11.7~23.3	
14		102.6~171.4	17.0~31.5	13.0~30.0	30.6~78.9	-8.6~22.4	
15		106.0~181.0	17.2~34.5	15.7~32.9	34.0~93.0	-9.4~24.1	
16		103.6~179.1	17.3~33.4	16.3~31.4	34.0~88.0	-6.9~19.5	
17		106.1~190.3	17.1~36.1	16.0~32.5	34.2~92.8	-9.8~22.1	
18		108.8~185.5	17.3~34.3	17.2~31.2	37.8~90.2	-9.0~22.7	
19		111.7~186.1	17.0~35.4	16.2~34.3	33.8~94.0	-14.2~24.6	
20		107.0~182.0	17.8~34.6	15.8~31.9	37.0~91.0	-11.0~22.1	
21		118.1~179.0	18.5~35.5	14.8~33.5	34.4~92.5	-10.0~26.1	
22		114.9~182.5	18.3~35.4	15.5~34.7	39.5~97.5	-9.1~19.7	

Table 1-22 Reference-value range for students aged 6~22 (physical fitness)

Gender	Age (year)	One foot stands with eyes closed (sec)	Pull-ups /sit-ups (times)	50 m run (sec)	Endurance running (sec)
Male	6	3.0~36.8	1~30	10.1~15.4	127.0~184.9
	7	3.0~60.3	2~30	9.9~13.9	117.3~181.0
	8	3.0~78.0	1~31	9.2~12.5	111.9~175.0
	9	3.0~77.0	1~41	8.8~12.9	108.0~175.0
	10	3.0~87.6	2~41	8.5~11.8	101.4~165.0
	11	3.0~62.8	1~35	8.3~11.7	99.2~171.8
	12	3.0~127.0	1~37	7.9~11.2	92.5~166.9
	13	4.0~152.0	1~10	7.3~10.0	211.3~414.9
	14	3.0~142.3	1~10	7.2~9.9	228.0~402.6
	15	3.0~160.6	1~10	6.8~9.8	211.9~370.7
	16	4.3~149.0	1~10	6.9~10.1	213.0~339.9
	17	3.0~167.7	1~10	6.9~10.0	208.0~351.2
	18	3.0~163.8	1~10	6.8~10.4	210.3~355.7
	19	4.0~215.7	1~12	6.8~9.6	207.2~352.9
	20	3.0~147.3	1~10	6.9~10.7	209.6~379.0
	21	4.0~174.0	1~11	6.7~8.8	219.6~376.4
	22	6.0~105.1	1~10	6.8~9.4	208.4~373.4
Female	6	3.0~55.3	1~26	11.1~14.8	129.4~187.7
	7	3.0~73.5	3~28	10.2~13.8	123.6~173.6
	8	3.6~106.0	2~30	9.5~13.5	115.7~172.0
	9	3.0~74.4	3~35	9.2~12.8	107.9~166.0
	10	3.0~133.4	3~35	9.0~11.9	108.0~163.9
	11	3.0~150.0	10~39	8.7~11.4	98.0~146.0
	12	3.0~149.0	9~40	8.5~12.0	103.0~279.8
	13	3.0~152.0	5~41	8.5~11.9	207.6~357.1
	14	3.0~150.0	7~38	8.5~12.1	227.4~356.0
	15	5.0~147.8	10~41	8.2~11.9	219.0~339.7
	16	4.0~156.0	9~40	8.5~11.6	216.0~329.8
	17	5.0~196.2	9~46	8.2~11.7	224.2~346.6
	18	4.0~159.5	6~43	8.3~12.7	229.0~351.5
	19	4.8~192.6	7~41	8.0~12.8	235.5~394.1
	20	4.0~156.0	6~38	8.4~12.4	227.9~350.2
21	4.0~160.7	7~40	8.3~12.6	222.3~354.2	
22	3.7~145.1	9~34	8.3~11.9	232.2~359.4	

**Table 1-23 Reference-value range for subjects aged 20~69**

Index	20~59 years old		60~69 years old	
	Male	Female	Male	Female
Height (cm)	157.0~181.0	148.0~169.6	152.6~176.5	142.5~164.9
Weight (kg)	47.9~88.3	41.2~74.5	45.1~85.0	39.6~76.8
Quitelet index	291.7~507.6	267.6~460.1	283.5~499.7	266.8~488.5
Sitting height index	52.0~56.3	52.0~56.6	52.0~56.3	52.0~56.6
Chest circumference (cm)	74.0~103.0	72.0~99.3	76.0~103.0	71.5~104.0
Chest circumference index	43.8~60.7	45.2~63.1	46.4~62.4	47.1~67.3
Waist circumference (cm)	62.0~100.0	58.0~91.0	65.0~102.5	63.0~101
WHR (%)	73.7~99.0	68.6~94.5	77.3~102.4	75.3~101.1
Hip circumference (cm)	79.0~106.0	78.0~104.2	79.0~108.0	78.0~109.1
Hip circumference index	46.8~62.4	46.8~65.9	48.6~65.0	51.8~71.3
Upper arm skinfold thickness (mm)	3.8~27.0	6.0~33.0	3.7~27.0	5.5~35.0
Subscapular skinfold thickness (mm)	6.0~34.5	7.5~38.0	6.0~35.0	6.5~42.0
Abdominal skinfold thickness (mm)	5.5~44.0	8.0~45.0	5.0~44.7	6.5~54.0
Sum of skinfold thickness (mm)	17.0~98.5	24.2~110.0	16.5~99.5	21.5~122.0
Resting pulse (times/minute)	62~98	62~98	60~100	60~100
Systolic pressure (mmHg)	90~148	90~140	100~172	95~175
Diastolic pressure (mmHg)	60~100	55~90	60~100	60~100
Pressure difference (mmHg)	20~50	20~50	20~70	20~70
Vital capacity(ml)	2135~5105	1295~3655	1206~3915	1090~2900
Vital capacity/weight (ml/kg)	31.4~81.6	22.7~69.1		
Grip strength (kg)	29.6~63	18.6~40.8	20.2~52.5	13.4~34.7
Back strength (kg)	76~189	38~115		
Vertical jump (cm)	17.8~51.4	11.5~35		
Sit-ups/push-ups (times)	3~50	0~41		
Sit and reach (cm)	-8.7~23.9	-4.8~24.0	-14.0~18.4	-8.2~21.7
One foot stands with eyes closed (OFSEC) (sec)	2.0~150.0	2.0~150.0	2.0~46.0	1.0~36.0
Selective respond time (sec)	0.34~0.78	0.36~0.86	0.4~1.4	0.5~1.6

## 5.2. Statistical Analysis

### 5.2.1. Grouping

(1) Young children were classified according to gender and age (1 year difference between each age group), giving rise to 8 groups in total.

(2) Students aged 6 to 22 were classified according to gender and age (1 year difference between each age group), giving rise to 34 age groups. In addition, students were also grouped into three groups: ages 6-12, 13-18 and 19-22, with 6 age groups altogether.

(3) Adults were classified into 4 categories according to age, gender, labor or non-labor intensive workers. Each age group had a 5 year difference, with 32 age groups altogether.

(4) Seniors were classified into 4 groups according to gender and age. Each age group had a 5 year difference.

(5) The seven communities in Macao were divided into three areas: Paróquia de Nossa Senhora de Fátima (north), Paróquia de Santo António and Paróquia de S. Lázaro (central) and Paróquia de S. Lourenço, Paróquia da Sé Catedral, Paróquia de Nossa Senhora do Carmo and Paróquia de São Francisco Xavier (south).

### **5.2.2. Indexes**

#### **5.2.2.1. Questionnaire items**

1) Young children: 18 items including general information (birth place, residence place, kindergarten, etc.), feeding pattern at birth, living habits, sports activities and the occurrence of diseases.

2) Students: 22 items including basic information (birth place, residence place and schooling, etc.), living habits, sports curriculum, extracurricular sports activities and the occurrence of diseases.

3) Adults: 31 items including general information (birth place, residence place, education level, profession, working environment, etc.), living habits, sports activities, occurrence of diseases and knowledge on physical fitness examination.

4) Seniors: 32 items including general information (birth place, residence place, education level, profession and working environment before retirement), living habits, sport activities, occurrence of diseases and knowledge on physical fitness examination.

#### **5.2.2.2. Indexes examined**

1) Anthropometric indexes: height, sitting height, weight, chest circumference, waist circumference, hip circumference, skinfold thickness, shoulder width, pelvis width and foot length; total of 10 items.

2) Physiological function indexes: resting pulse (heart rate), blood pressure, vital capacity, step test (adults), total of 4 items.

3) Physical fitness indexes:

##### **■ Young children**

3-6 years old: 6 items including 10 m shuttle run, standing long jump, walking on balance beam, successive jumps with both feet, tennis ball distance throw and sit and reach.

##### **■ Children and adolescents:**

6 -12 years old: 11 items including 50 m run, 50 m x 8 shuttle run, standing long jump, pull-ups with body inclined (male), one-minute sit-ups (female), vertical jump, grip strength, back strength, sit and reach, one foot stands with eyes closed (OFSEC) and selective response time.

13-18 years old: 11 items including 50 m run, 800 m run (female) or 1000 m run (male), standing



long jump, pull-ups(male), one-minute sit-ups (female), vertical jump, grip strength, back strength, sit and reach, one foot stands with eyes closed (OFSEC), and selective respond time.

19 to 22 years old: 11 items including 50 m run, 800 m run (female) or 1000 m run (male), standing long jump, pull-ups(male), one-minute sit-ups (female), vertical jump, grip strength, back strength, sit and reach, one foot stands with eyes closed (OFSEC) and selective respond time.

■ **Adults**

20-39 years old: 8 items including vertical jumps, grip strength, back strength, push-ups (male), one-minute sit-ups (female), sit and reach, one foot stands with eyes closed (OFSEC) and selective respond time.

40-59 years old: 4 items including grip strength, sit and reach, one foot stands with eyes closed (OFSEC) and selective respond time.

■ **Seniors**

4 items including grip strength, sit and reach, one foot stands with eyes closed (OFSEC) and selective respond time.

**5.2.2.3. Derivative indexes**

Derivative indexes included BMI, Quitelet Index, WHR (waist-hip ratio), percent body fat, lean body mass, pressure difference and vital capacity/weight.

The derivative indexes were calculated as follows:

$$\text{BMI} = \text{weight}/\text{height}^2 \text{ (kg/m}^2\text{)}$$

$$\text{Quitelet Index} = \text{weight}/\text{height} \times 1000 \text{ (kg/cm)}$$

$$\text{WHR} = \text{waist circumference}/\text{hip circumference} \times 100\%$$

$$\text{Percent body fat (\%)} = (4.570 \div \text{Db} - 4.142) \times 100$$

$$9\sim 11 \text{ years old: Db} = 1.0879 - 0.00151X(\text{male}), \text{ Db} = 1.0794 - 0.00142X(\text{female})$$

$$12\sim 14 \text{ years old: Db} = 1.0868 - 0.00131X(\text{male}), \text{ Db} = 1.0888 - 0.00153X(\text{female})$$

$$15\sim 18 \text{ years old: Db} = 1.0977 - 0.00146X(\text{male}), \text{ Db} = 1.0931 - 0.00160X(\text{female})$$

$$\text{Above } 19 \text{ years old: Db} = 1.0913 - 0.00116X(\text{male}), \text{ Db} = 1.0897 - 0.00133X(\text{female})$$

$$X = \text{upper arm skinfold thickness} + \text{subscapular skinfold thickness (mm)}$$

$$\text{Lean body mass} = \text{weight} - \text{weight} \times \text{percent body fat}$$

$$\text{Pressure difference} = \text{systolic pressure} - \text{diastolic pressure}$$

**5.2.2.4. Health indexes**

The occurrence of dental decay, vision defect (mild, moderate and severe), nearsighted, and color

vision deficiency were examined. Dental decay was indicated by the percentage of decay (%). The occurrence of primary tooth decay (dmf) included primary tooth decay (d), tooth loss (m) and tooth filling (f) ( $dmf=d+m+f$ ). The occurrence of permanent tooth decay (DMF) included permanent tooth decay (D), tooth loss (M) and tooth filling (F) ( $DMF=D+M+F$ ).

Vision defect was indicated by the proportion of poor vision detected, nearsighted and the degree of poor vision. A visual activity of less than 5 is considered as poor vision, a 4.9 visual activity is considered as mildly poor vision, a 4.6-4.8 visual activity indicates moderately poor vision, and  $\leq 4.5$  is considered as severely poor vision. Using string mirror can further assess the refractive error. Subjects were considered to be “nearsighted” when positive vision decreased and negative vision increased.

### 5.2.3. Contents of Calculation

(1) The valid sample size of each population group was calculated according to age groups.

(2) The actual valid sample size of different age groups was calculated according to **Grouping (items 1-4)** under Statistical Analysis.

(3) The origin of the subjects, sampling sites and some general information (birth place, residential areas, kindergarten and schooling, education level, occupation and working environment, etc.) of the subjects in each age group were calculated according to **Grouping (items 1-4)** under Statistical Analysis, i.e. frequency and cumulative frequency.

(4) The frequency, population percentage and full sampling cumulative frequency and population percentage of the questionnaire items in each age group were calculated according to **Grouping (items 1-4)** under Statistical Analysis .

a. Young Children: number of samples, mean, standard deviation and percentile of the subjects' birth weight and birth length were calculated. Habits including average daily accumulated sleeping hours, hours of outdoor activity, hours of watching TV, video and playing computer games were determined. Information regarding involvement in extracurricular activities, type of sports participated and occurrence of disease was also examined.

b. Students: living habits including daily accumulated walking time and transportation means to and from home and school, hours of outdoor activities, hours of watching TV, video and playing computer games, hours of doing daily homework at home, average daily sleeping hours (included nap time) and involvement of extracurricular activities (hobby classes) were examined. Information on physical education in school such as the number of physical education class per week and the self-claimed exercise intensity was investigated. The frequency, duration, intensity and the type of sports participated during extracurricular physical exercise were examined. The occurrence of diseases within the last 5 years was also examined.

c. Adults and Seniors: daily sleeping hours and sleeping quality, accumulated hours of walking and sitting, types of activities during leisure time, smoking and alcohol drinking; frequency, duration and persistence of exercising, purpose of exercising, types of sports, locations, feeling and major obstacles from exercising, the occurrence of any diseases for the last 5 years and the understanding of “physical

fitness monitoring”.

(5) The number and the percentage of the subjects who were ‘frequent exerciser’, “occasional exerciser” or “non-exerciser” were calculated according to **Grouping (items 2-4)** under Statistical Analysis. “Frequent exerciser” was defined as people who exercised 3 times or more per week, each time for longer than 30 minutes with moderate intensity. People who achieved one or two of the above exercise conditions but not all three conditions at the same time was defined as “occasional exerciser”. People who did not meet any of the above exercise condition were defined as “non-exerciser”.

(6) Number of samples, mean, standard deviation and percentile of all examined variables of each age group were calculated according to **Grouping (items 1-4)** under Statistical Analysis.

(7) Number of samples, mean, standard deviation and percentile of the derivative indexes of each age group were calculated according to **Grouping (items 1-4)** under Statistical Analysis.

(8) Number of samples and proportion of dental decay (%) including primary and permanent tooth decay of each age group in **Grouping (item 1)** under Statistical Analysis were calculated.

(9) Number of samples, occurrence of dental decay (%), vision defect, nearsighted and color vision deficiency of each age group in **Grouping (item 2)** under Statistical Analysis were calculated.

(10) Individual sampling difference test and single factor variance analysis were used to examine the difference of all examined variables, derivative indexes and health indexes among different age groups and genders.

#### **5.2.4. Elaboration on Calculation Methods**

##### **5.2.4.1. Mean**

Mean indicates the average level or intensified trend of a group of observed values, and calculated with the following formula:

$$Mean = \frac{\sum x}{n}$$

$x$  indicates the observed value and  $n$  indicates the sample size.

##### **5.2.4.2. Standard deviation**

Standard deviation indicates the variation of a group of observed values, where the smaller the standard deviation, the smaller the variation. Standard deviation is indicated by  $Sd$  and calculated with the following formula:

$$Sd = \sqrt{\frac{\sum x^2 - \frac{(\sum x)^2}{n}}{n-1}}$$

5.2.4.3. Percentile

Percentile is commonly used when the frequency distribution of the variables is not normal. If all the observed values are arranged in sequence from small to large, the values at the positions of 1~100 percent of all the observed values may be called 1~100 percentile respectively. It is indicated by Px and calculated with the following formula:

$$P_x = X\% \times (n+1)$$

5.2.4.4. t - Test

Calculated with the following formula:

$$t = \frac{|M_1 - M_2|}{\sqrt{S_{m1}^2 + S_{m2}^2}}$$

M<sub>1</sub> represents the mean of index 1 and M<sub>2</sub> represents the mean of index 2; S<sub>m1</sub> is the standard error of measurements (SEM) of index 1 and S<sub>m2</sub> is the standard error of measurements of index 2. S<sub>m</sub> (standard error) is calculated with the following formula:

$$S_m = \frac{Sd}{\sqrt{n}}$$

**Table 1-24 Degree of freedom (n') = n<sub>1</sub> + n<sub>2</sub> - 2. Significance of the difference is determined by the t-value as follows:**

t	P	Significance of difference
< t(n')0.05	> 0.05	No significant difference
≥ t(n')0.05	≤ 0.05	Of significant difference (*)
≥ t(n')0.01	≤ 0.01	Of large significant difference (**)

Note: “\*\*\*”P<0.01, “\*” P<0.05.

When sample size n ≥1000,

if t < 1.96, P > 0.05 indicates no significant difference between the two tested average.

if 2.58 > t ≥ 1.96, P ≤ 0.05 indicates significant differences found between the two tested average.

if t ≥ 2.58, P ≤ 0.01 indicates large significant differences found between the two tested averages.

5.2.4.5. Proportion

$$\text{Proportion} = \frac{\text{Number of Positive Samples}}{\text{Total number of sample examined}} \times 100\% \text{ (or 1000\%)}$$

5.2.4.6. Significance test for proportion

1. Significance test for the difference between sampling proportion and total proportion

When the observed samples are of fairly large number, the frequency distribution of the sampling proportion appears to be close to normal distribution. The difference significance of regularity test proportion of normal distribution may be applied and it is not necessary to check the t-value table. The standard error of proportion may be obtained from calculation according to total proportion, and then calculate how many times the difference between sampling proportion and total proportion are to the standard error, which is called  $u$  and its formula is:

$$u = \frac{|P - \pi|}{S_p} = \frac{|P - \pi|}{\sqrt{\frac{\pi(1 - \pi)}{n}}}$$

in which:  $P$ ----- sample proportion

$\pi$ ----- proportion tested against

$S_p$ -----standard error

2. Significance test for the difference between two proportions

The calculation formula is:

$$u = \frac{|P_1 - P_2|}{S(p_1 - p_2)} = \frac{|P_1 - P_2|}{\sqrt{P(1 - P)(\frac{1}{n_1} + \frac{1}{n_2})}}$$

in which:  $P_1, P_2$ -----respective positive proportion of both samples

$S(P_1 - P_2)$ ---the difference in standard error of the two proportions

$P$ -----sum of the positive proportion of the two groups

$n_1, n_2$ ---two sample sizes

<b>Table 1-25   U   , P and the Difference Significance</b>		
<b>  U  </b>	<b>P</b>	<b>Significance of Difference</b>
< 1.96	> 0.05	No significant difference
≥ 1.96	≤ 0.05	Of significant difference (*)
≥ 2.58	≤ 0.01	Of large significant difference (**)

Note: “\*\*\*” $P < 0.01$ , “\*\*”  $P < 0.05$

5.2.5. Statistics Tools

SPSS10.0 Statistical Package Software was used for statistic analysis.

# PART II

## Monitoring Results

human genome project

```
0101 011 0101 0101 1100 01 01010 11 01 100 101 0110 01 01 1011 01 0101
1 10 1 11 01 1 11 111 01010101 01 0101 10
10 0 101 010 1 10 1 10 101010101 1010 1110110101
11 0 10 10 10101 1010 10101
1 01101010 1010
10 01 01010
1 0 10 01
1010 1011 0
101010 101 0
00000000
11 0101 10
110 1 010
100 110111011 1010
1010 105 010 0100 0 010 101 101
100 1 10 100011 101 0 101
011010 010101 010 010
010 1 01 10 1 1 01 0
11 01 1 010 1 1 1 10 01010 1 01 110011 101001010110101
110 10 10100 11010 1 010 0 1101 101 210
1 111010010010101 0100101 1010 0101010 1010
```

## Part II Monitoring Results

### 1. Young Children

#### 1.1. Physical Fitness Conditions of Young Children in 2010

##### 1.1.1. Basic Information of the Subjects

Young children were divided into two groups according to gender, and then further classified into age groups differed by one year, altogether having 8 groups in the young children category.

From Paróquia de Nossa Senhora de Fátima (north), 368 subjects (218 boys and 150 girls) were selected from two sampling sites: Keang Peng School (kindergarten) and Hou Kong Middle School (affiliated kindergarten). From Paróquia de Santo António and Paróquia de S. Lázaro (central), 448 subjects (294 boys and 154 girls) were selected from Pui Ching Middle School (kindergarten) and Chan Sui Ki Perpetual Help College (branch school). From Paróquia da Sé Catedral and Paróquia de S.Lourenço, Na.Sra.do Carmo, S.Francisco (south and outlying island area), 249 subjects (153 boys and 96 girls) were drawn from Pooi To Middle School (branch school of Praia Grande) (kindergarten) and Estrela do Mar School (kindergarten). Table 3-1-1-1 showed the Distribution of sampling sites (kindergartens) , Table 3-1-1-2 showed the Residential distribution of the subjects(%) and Table 2-1-1-1 showed the sample size in each age group.

Gender	3 years	4 years	5 years	6 years	Total
Boys	193	185	189	98	<b>665</b>
Girls	102	117	107	74	<b>400</b>
Total	295	302	296	172	<b>1065</b>

Among the 1065 subjects, 92.3 % of the boys and 89.0 % of the girls were born in Macao, followed by Mainland China, Hong Kong and other countries (regions) (Table 3-1-1-3). 95.6% of the boys and 95.5% of the girls went to full day kindergarten, whereas about 4~5 % of the young children went to half day kindergarten or did not attend kindergarten (table 3-1-1-4). 1/2 of the young children were under the parents' care and 1/3 was under the care of the elderly or baby-sitters. The proportion of young children under the direct care of their own parents increased with age (table 3-1-1-5).

##### 1.1.2. Lifestyle

Information regarding birth, feeding patterns, habits, types of physical exercise involved and occurrence of diseases were examined in the young children category.

###### 1.1.2.1. Birth and feeding methods

Our study showed that infants with full term birth accounted for 83.9 %, while those of premature and post term birth accounted for 13.3 % and 2.7 % respectively. No significant difference in gestational age at birth was found between genders or among age groups (table 3-1-2-1).

The average birth weight of the young children category was  $3.2 \pm 0.5$  kg, No significant difference in birth weight was seen between genders or among age groups (table 3-1-2-2).

The average birth length of the young children category was  $48.7 \pm 3.1$  cm. The average birth length of the boys and girls were  $48.9 \pm 3.2$  cm and  $48.4 \pm 3.0$  cm, respectively. No significant difference in birth length was found between genders or among age groups (table 3-1-2-3).

Feeding methods included breast feeding, formula feeding and mixed feeding. The proportion of young children who were formula-fed, breast-fed or a combination of both (mixed feeding) within the first four months after birth were 55.3%, 13.8% and 30.9%, respectively. The proportion of boys (57.3%) who were formula-fed was significantly higher than that of girls (52.0%), but the difference did not reach significant level. No significant difference in feeding methods was observed among age groups of 3~6 (table 2-1-1-1, figure 3-1-2-4).

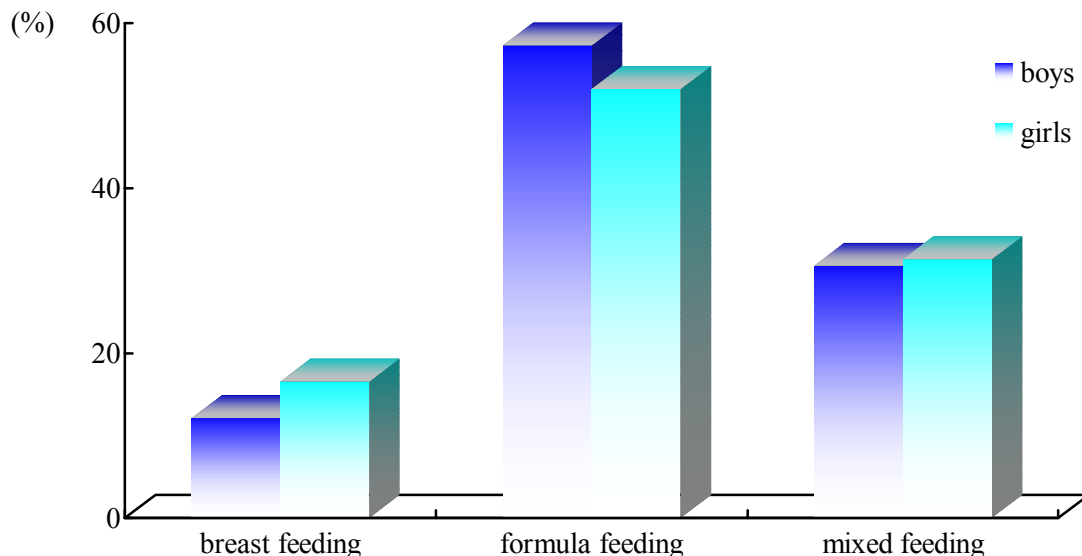


Figure 2-1-1-1 Proportion of feeding methods in young children

### 1.1.2.2. Habits

Information on examined habits included accumulated sleeping time (included nap time), average accumulated hours of outdoor activities, average hours of indoor activities such as watching TV, video and playing computer games and participation in extracurricular activities per day(hobby class).

Our study showed that the proportion of young children who slept for 8-10 hours/day, more than 10 hours/day and less than 8 hours/day were 72.7 %, 25.0 % and 2.3 %, respectively. No significant difference in sleeping hours was found between genders. The proportion of young children with more than 10 hours of sleep decreased gradually while the proportion of young children with less than 8 hours of sleep increased as age increased (figure 2-1-1-2, table 3-1-2-5).



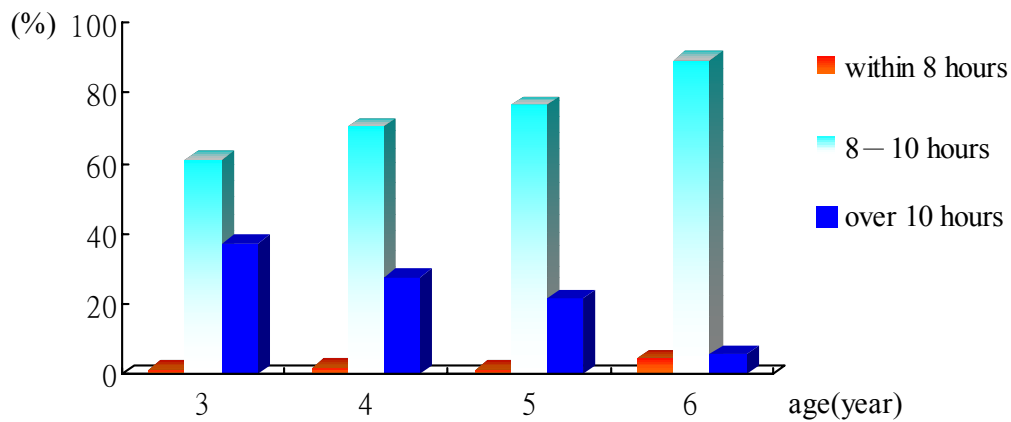


Figure 2-1-1-2 Proportions of sleeping hours in young children

Accumulated hours of outdoor activities referred to the total amount of time that the young children spent on outdoor activities, games, exercises and sports activities. Young children who spent 30 minutes ~1 hour daily on outdoor activities accounted for the highest proportion (42.4 %), followed by those spending less than 30 minutes (30.9 %), 1~2 hours (~20 %) and more than 2 hours (6.7 %) on outdoor activities. No significant difference was found between genders in the accumulated hours of outdoor activities, but significant difference was found among age groups ( $P < 0.05$ ). As age increased, the proportion of young children spending more than 1 hour on outdoor activities declined, while those spending less than 1 hour increased gradually (figure 2-1-1-3, table 3-1-2-6).

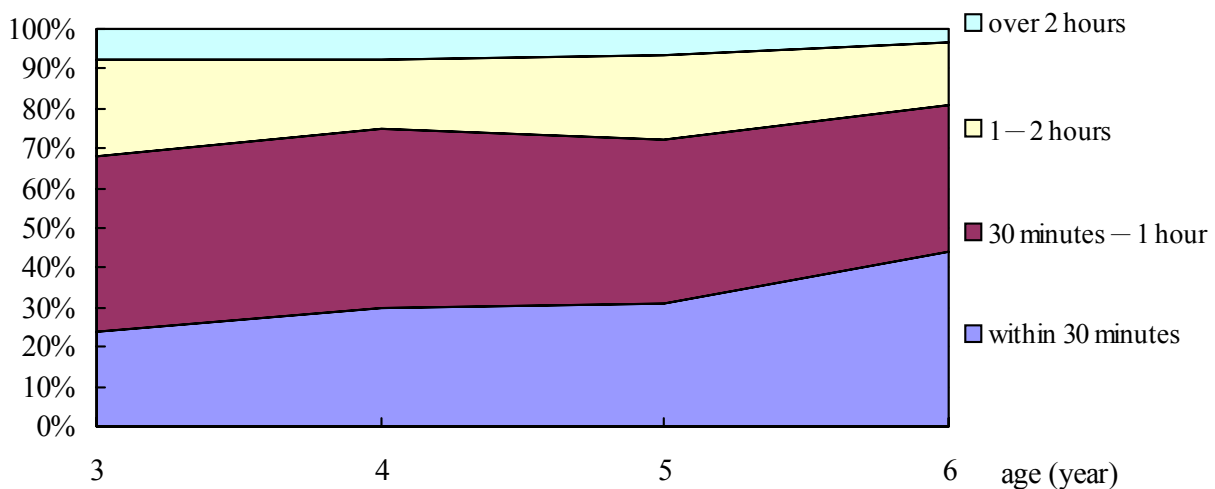


Figure 2-1-1-3 Proportion of average daily hours on outdoor activities in young children (%)

The proportion of young children spending less than 30 minutes, 30 minutes~1 hour, 1~2 hours, 2~3 hours and over 3 hours on watching TV, video and playing computer games daily were 16.4 %, 32.1 %, 32.7 %, 15.5 % and 3.2 %, respectively. No significant difference in the hours of indoor activities was seen between genders or among different age groups (table 3-1-2-7).

Young children participating in extracurricular activities (hobby classes) accounted for 56.1%, with 29.4 %, 17.0 % and 9.7 % of the young children participated in one, two and three extracurricular activities, respectively. Young children who participated in music and dancing classes accounted for the highest proportion (54.7 %), followed by those participating in drawing and calligraphy classes (38.7 %), tutoring class (30.5 %) and sports activities (20.2 %) (table 3-1-2-8).

Proportion of young children participated in extracurricular activities (hobby classes)—differed significantly among different age groups ( $P < 0.05$ ), with increasing proportion of young children participating in extracurricular activities as age increased. The proportion of young children involved in extracurricular activities at 3, 4, 5 and 6 years old were 35.8 %, 52.2 %, 73.5 % and 68.0 %, respectively (figure 2-1-1-4).

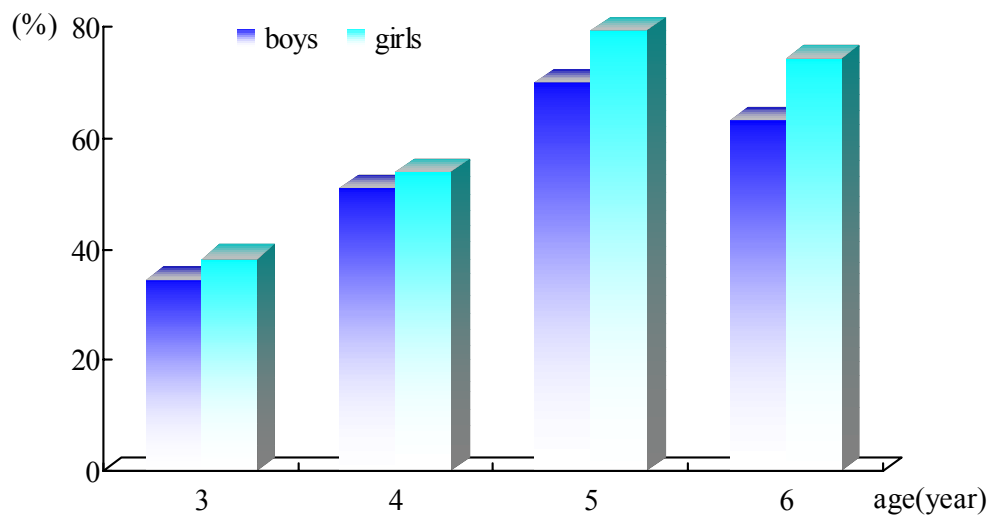


Figure 2-1-1-4 Proportion of extracurricular activities participation in young children (%)

### 1.1.2.3. Physical exercise

Information about physical exercise such as hobby classes, exercise organized by clubs and individual exercise that the young children participated outside kindergarten was investigated. Biking (41.2%), swimming (23.5%), ball games (24.0%), dancing (19.5%) and gymnastics (17.4%) were the top five sports with highest participation. The most popular sports for boys and girls were different. Biking had the highest participation (47.7%) in boys, while dancing accounted for the highest participation (39.2%) in girls. The proportion of young children participated in other sports were relatively low (figure 2-1-1-5, figure 2-1-1-6, table 3-1-2-9).

The proportion of young children participating in various sports among different age groups did not differ significantly. Sports with higher participation were biking, swimming, ball games, dancing and gymnastics etc.

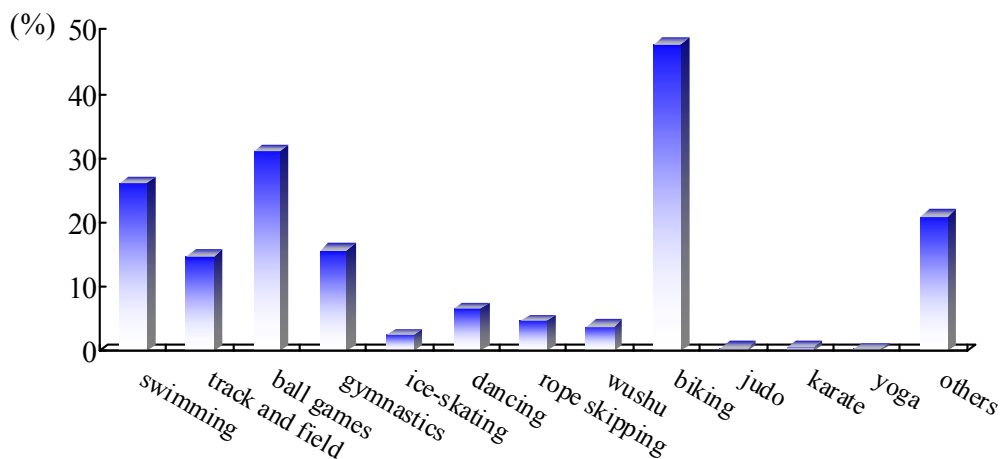


Figure 2-1-1-5 Proportion of physical exercises in young children (boys) (%)

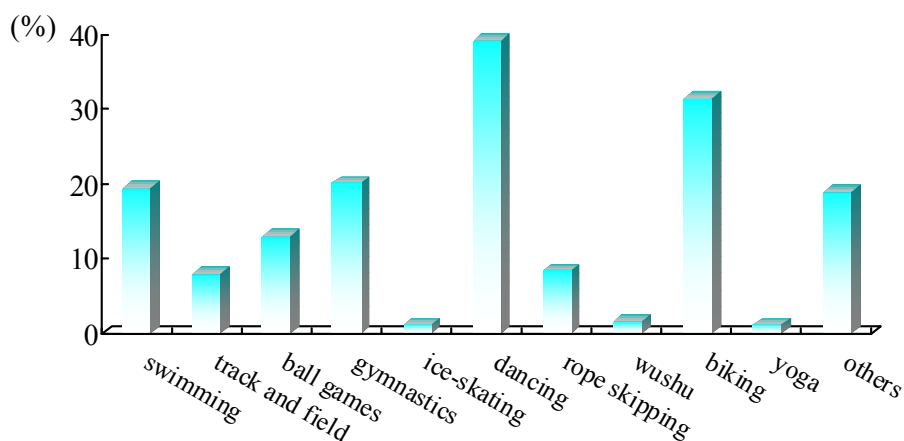


Figure 2-1-1-6 Proportion of physical exercises in young children (girls) (%)

**1.1.2.4. Occurrence of diseases**

Our study showed that 97.0 % of the young children had a cold or fever in the previous year. Among these young children, 63.3 % suffered three times or more from a cold or fever in the previous year. No difference between genders in the number of times of catching a cold was observed but significant difference was found among different age groups ( $P < 0.05$ ). Generally speaking, the proportion of young children catching a cold three times a year declined gradually as age increased (figure 2-1-1-7, table 3-1-2-10).

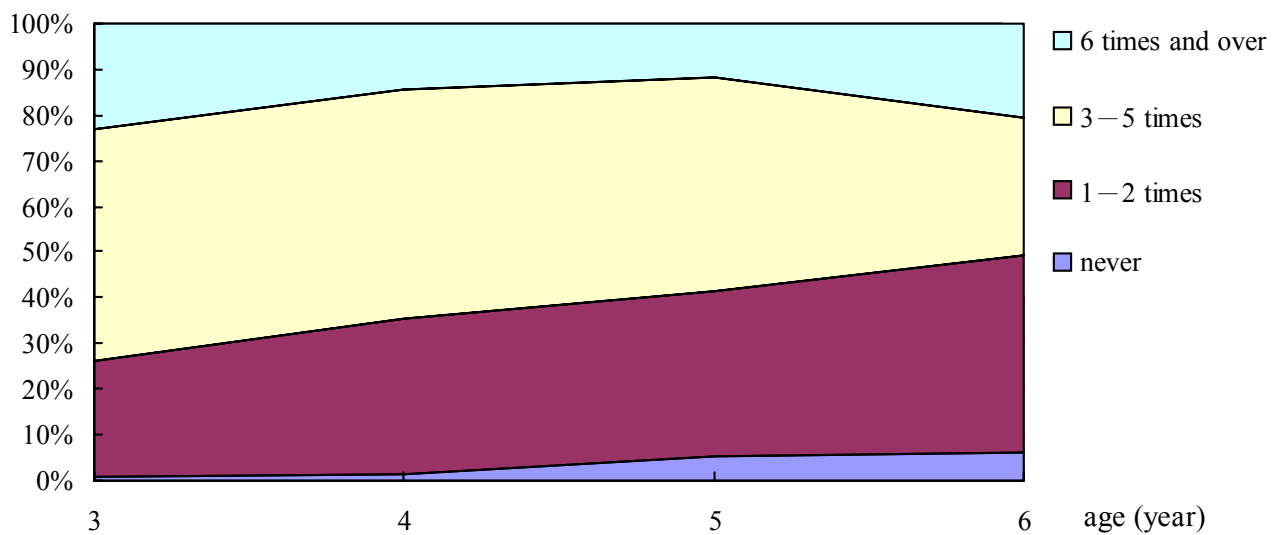


Figure 2-1-1-7 Proportion of young children experiencing a cold or fever in the previous year (%)

Young children diagnosed with illness by the hospital accounted for 20.1%. The percentage of young children diagnosed with illness at age 3, 4, 5 and 6 were 19.0 %, 22.8%, 21.3 % and 15.1 %, respectively, with the 6 years old children having the lowest percentage. Diseases with high occurrence were chronic bronchitis (34.4 %), pneumonia (31.6 %) and asthma (9.9 %). The occurrence of diseases among boys was less than that of girls, but no significant difference was observed (table 3-1-2-11 and table 3-1-2-12).

### 1.1.3. Anthropometric Measurements

#### 1.1.3.1. Length indexes

Height and sitting height are two indexes commonly used to reflect the normal physical characteristic of human body. Height shows mainly the level of longitudinal growth of human skeleton, and sitting height shows the length of trunk.

The height, sitting height and foot length of young children of both sexes increased with age. The height of boys and girls ranged from 99.8~119.2 cm and 98.2~118.0 cm, respectively. Sitting height ranged from 57.4~65.5 cm and 56.3~64.5 cm for boys and girls, respectively. As for the foot length, it ranged from 15.9~18.5 cm and 15.2~18.1 cm for boys and girls, respectively (table 3-1-3-1, table 3-1-3-2 and table 3-1-3-3).

Height, sitting height and foot length of boys were higher than that of girls. Significant difference between genders was found in sitting height and foot length ( $P < 0.05$ ) (figure 2-1-1-8, figure 2-1-1-9 and figure 2-1-1-10).

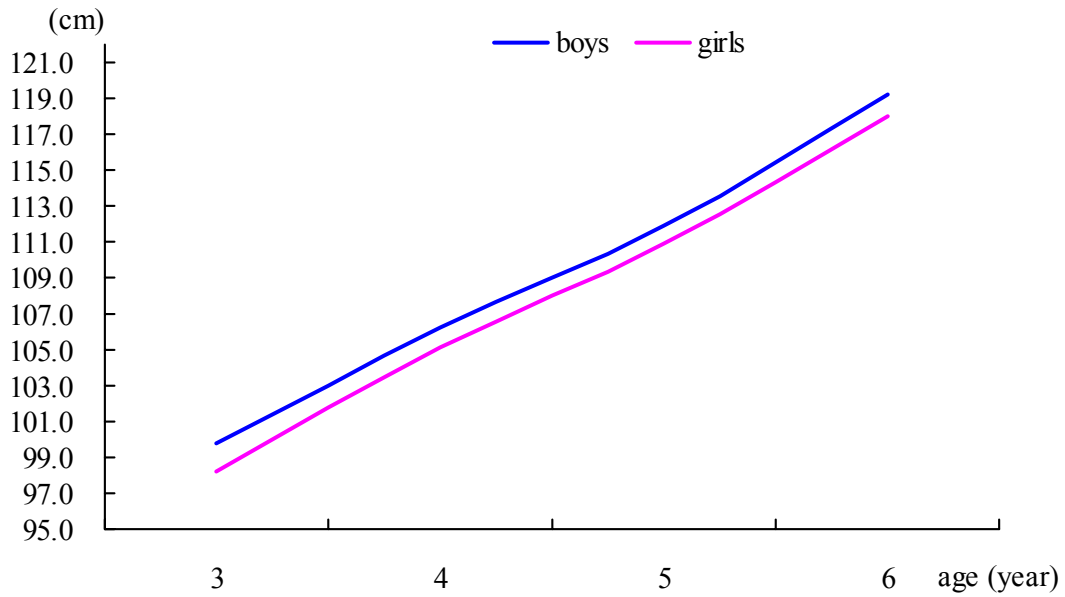


Figure 2-1-1-8 Average height of young children

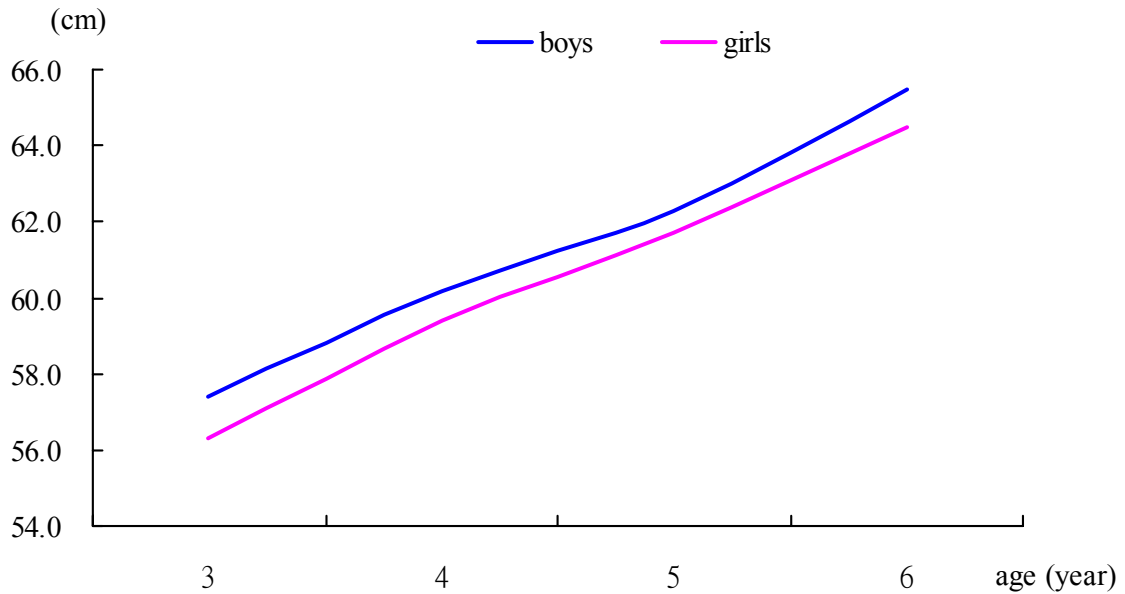


Figure 2-1-1-9 Average sitting height of young children

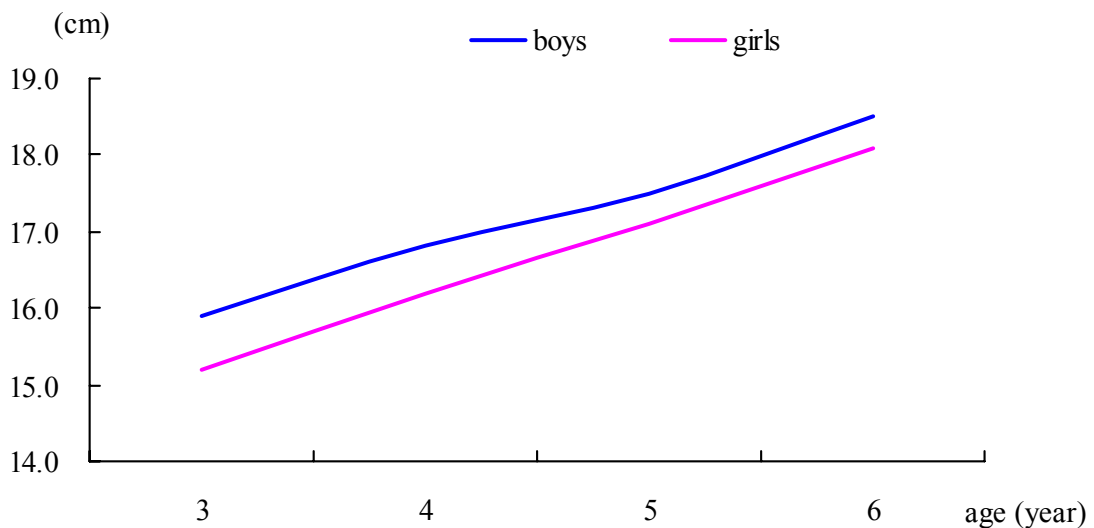


Figure 2-1-1-10 Average foot length of young children

1.1.3.2. Weight and BMI

Weight and BMI are indexes commonly used to reflect the physical characteristic of human body. Weight shows how much the human body weighs, while BMI= weight (kg)/height (m<sup>2</sup>), is used to evaluate obesity level.

The weight of young children increased with age, and the weight of boys and girls ranged from 15.7~22.8 kg and 15.1~21.6 kg, respectively (table 3-1-3-4).

BMI of young children was fairly stable and varied very little as age increased. BMI of boys and girls ranged from 15.6~15.9 and 15.2~15.5, respectively (table3-1-3-5).

There were significant differences in the average weight and the BMI of boys and girls (p<0.05) (Figure 2-1-1-11, Figure 2-1-1-12).

According to the weight for height standard of young children from the “Physical Fitness Standards for Chinese Citizens”, 5.2%, 13.5%, 11.6% and 15.3% of boys aged 3~6 were overweight, and 4.9%, 6.8%, 7.5%, 6.8% of girls aged 3~6 were overweight (table3-1-3-6 and figure 2-1-1-13).

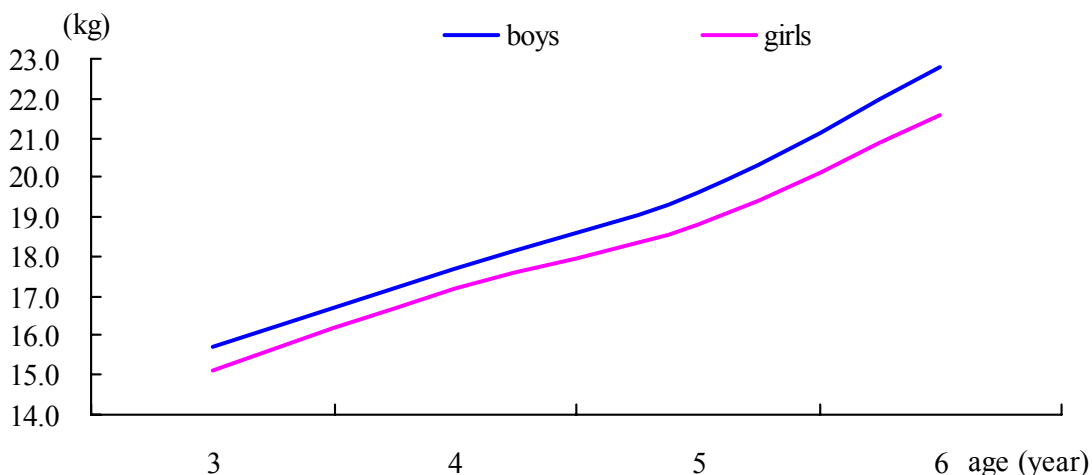


Figure 2-1-1-11 Average weight of young children

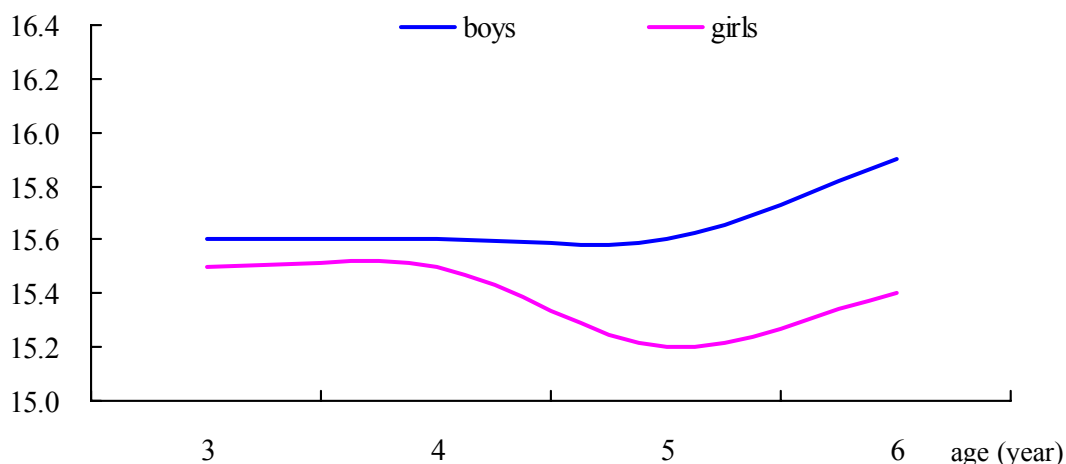


Figure 2-1-1-12 Average BMI of young children

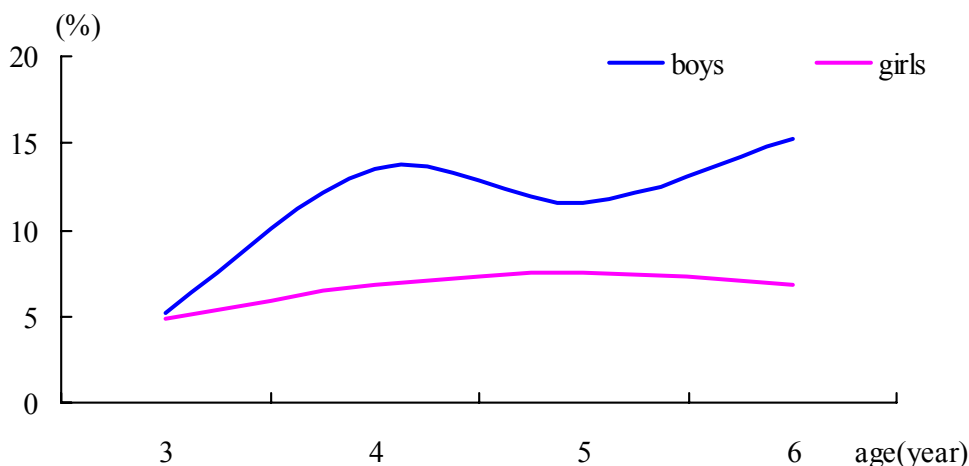


Figure2-1-1-13 Proportion of overweight in young children

**1.1.3.3. Circumference indexes**

Circumference index is commonly used to reflect mainly the amount of subcutaneous fat and muscles. Chest circumference reflects mainly the size of chest, the growth of chest muscles can also reflect the body shape and the development of the respiratory system. Waist circumference mainly reflects abdominal subcutaneous fat and growth of muscles. Hip circumference reflects hip skeleton, muscle and subcutaneous fat.

Chest, waist and hip circumference of young children increased with age. The average chest circumference of boys and girls ranged from 51.7~58.1 cm and 50.5~56.7 cm, respectively. The average waist circumference of boys and girls ranged from 48.8~54.7 cm and 48.5~52.6 cm, respectively. The average hip circumference ranged from 53.3~62.5 cm and 53.2~60.8 cm, respectively (table 3-1-3-7~table 3-1-3-9).

WHR (Waist-Hip Ratio) of young children declined as age increased. WHR of boys and girls ranged from 0.874~0.918 and 0.863~0.912, respectively (table 3-1-3-10).

The average chest, waist circumference and the WHR of boys were higher than girls, with chest and waist circumferences ranging from 1.2~1.6 cm and 0.3~2.1 cm, respectively. WHR ranged from 0.006~0.019. Significant difference in chest and waist circumference and WHR was found between genders ( $P < 0.05$ ). No significant difference in hip circumference was found between genders (figure 2-1-1-14~figure 2-1-1-17).

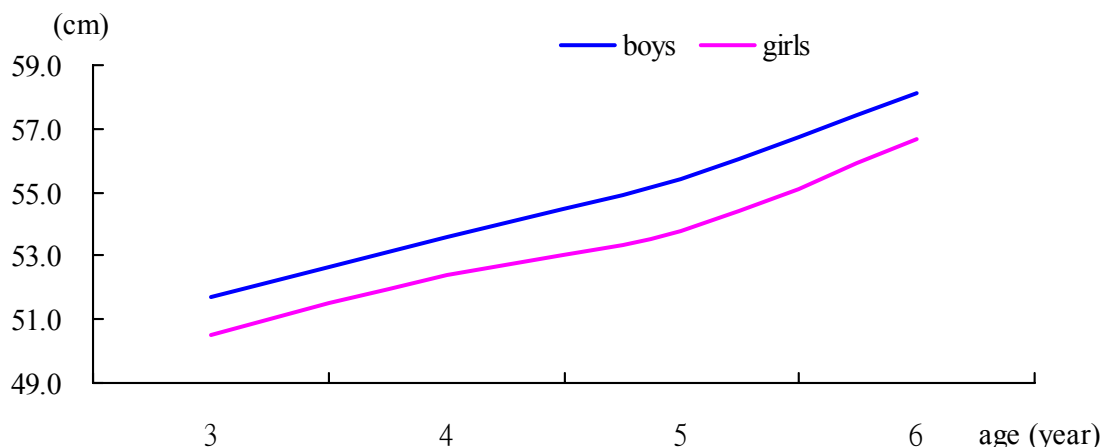


Figure 2-1-1-14 Average chest circumference of young children

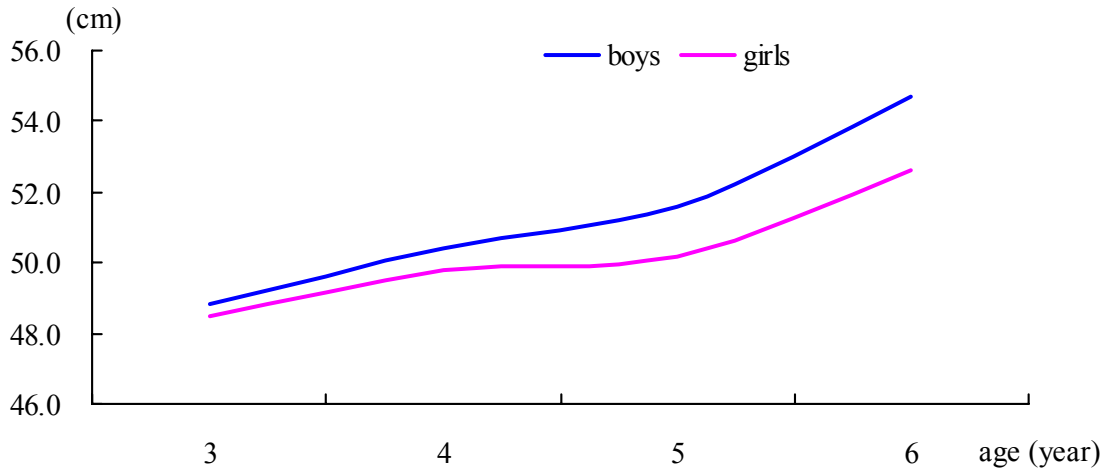


Figure 2-1-1-15 Average waist circumference of young children

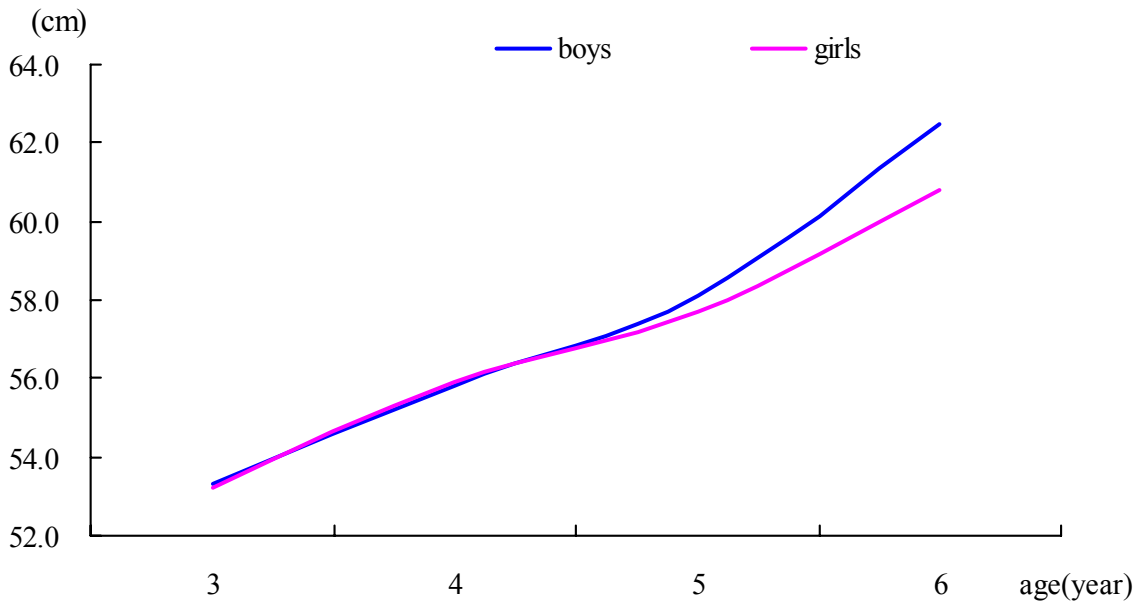


Figure 2-1-1-16 Average hip circumference of young children

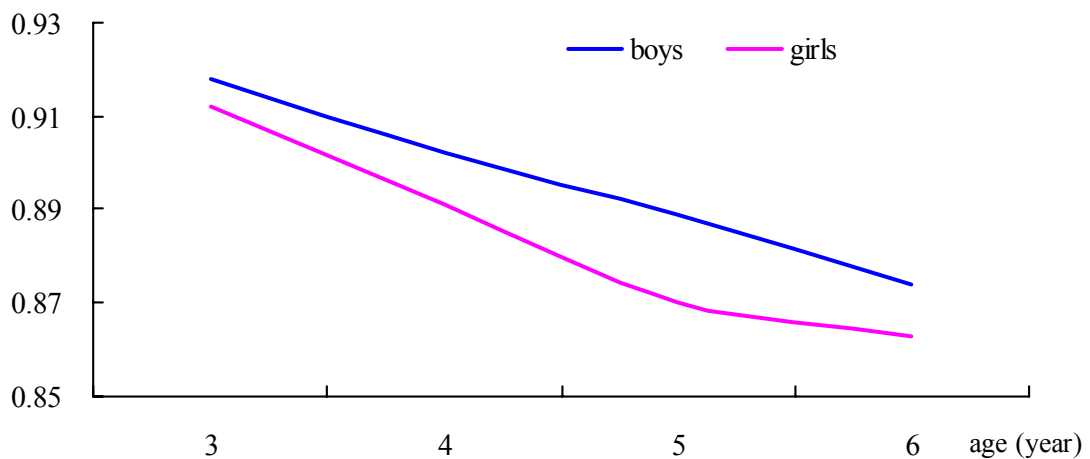


Figure2-1-1-17 Average WHR of young children



1.1.3.4. Width indexes

Shoulder and pelvis width are the two important indexes used to reflect body shape and horizontal growth of humans. Shoulder and pelvis width of boys and girls increased with age. The average shoulder width of boys and girls ranged from 21.5~25.4 cm and 21.9~25.5 cm, respectively. The average pelvis width of boys and girls ranged from 16.0~18.6 cm and 15.9 ~18.4 cm, respectively (table 3-1-3-11 and table 3-1-3-12).

No significant differences between genders in shoulder and pelvis width of young children were observed (figure 2-1-1-18, figure 2-1-1-19).

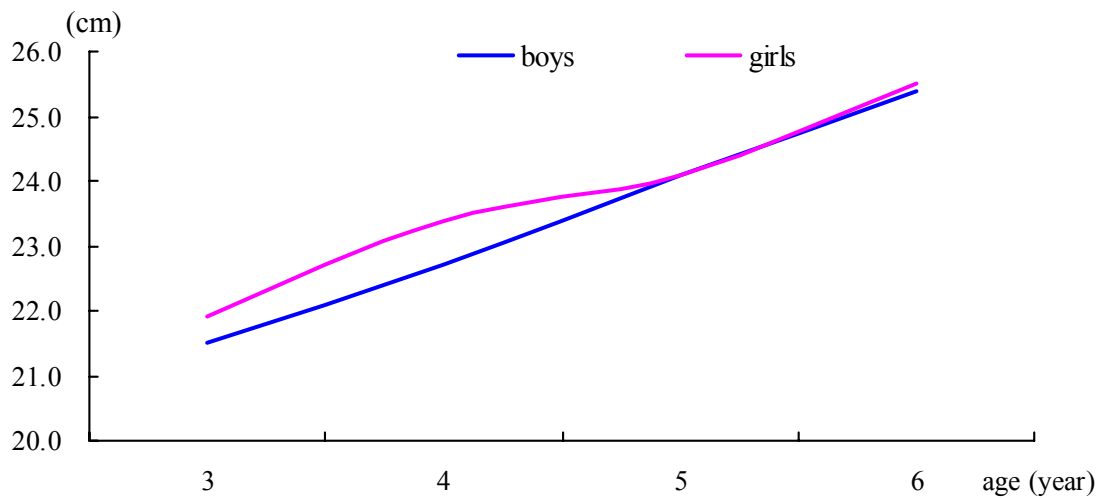


Figure 2-1-1-18 Average shoulder width of young children

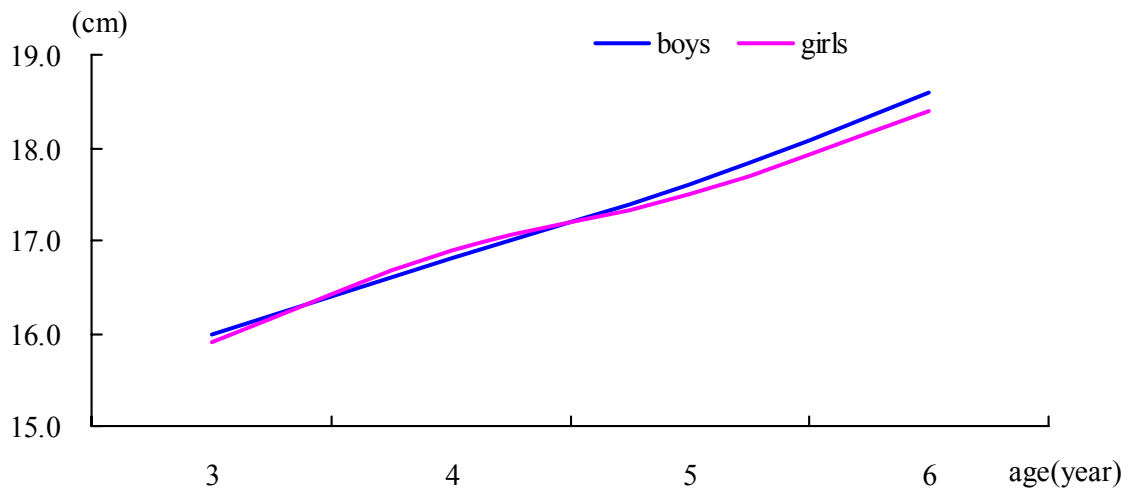


Figure 2-1-1-19 Average pelvis width of young children

1.1.3.5. Body composition

Skinfold thickness reflects mainly the amount of subcutaneous fat and is often used to evaluate body composition.

The skinfold thickness of the upper arm, subscapular and abdomen of boys increased with age; whereas the skinfold thickness of these three sites was relatively stable in girls without apparent increase. The average skinfold thickness of upper arm for boys and girls were 7.7~8.5 mm and 10.0~10.9 mm, respectively. The average subscapular skinfold thickness for boys and girls were 3.6~4.6 mm and 5.7~6.5 mm, respectively. The average abdominal skinfold thickness were 4.1~6.4 mm and 6.9~8.4 mm, respectively (table 3-1-3-13~table 3-1-3-15).

The skinfold thickness of all three sites of girls was larger than boys, and the rate of increase tended to slow down with age. The differences in the upper arm, subscapular and abdominal skinfold thickness between boys and girls ranged from 1.5~3.1 mm, 1.4~2.7 mm and 2.0~3.2 mm, respectively, with significant difference found in all ages ( $P < 0.05$ ) (figure 2-1-1-20~figure 2-1-1-22).

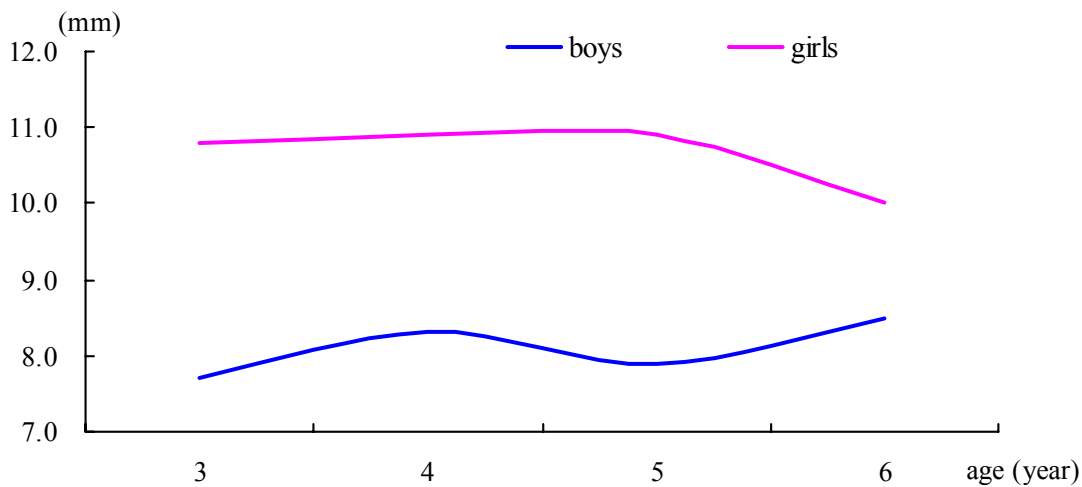


Figure 2-1-1-20 Average upper arm skinfold thickness of young children

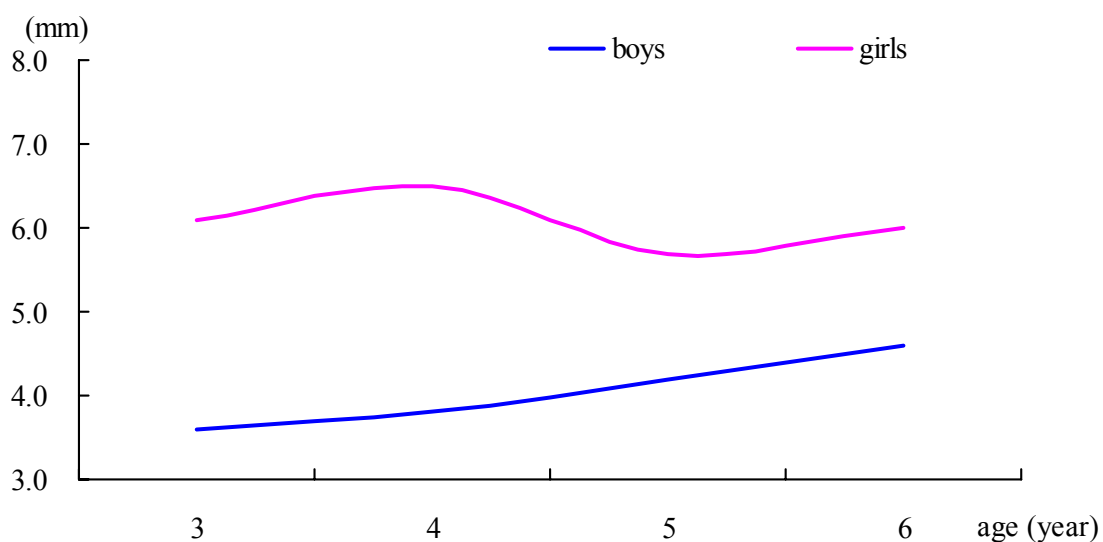


Figure 2-1-1-21 Average subscapular skinfold thickness of young children

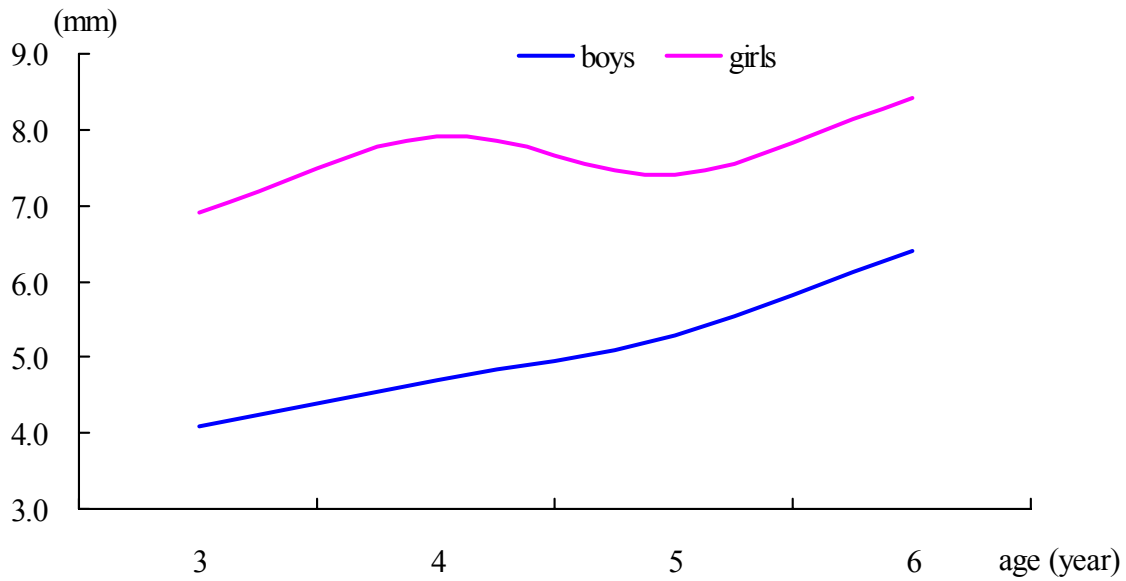


Figure 2-1-1-22 Average abdominal skinfold thickness of young children

#### 1.1.4. Physiological Function

Resting heart rate can be used to reflect the growth of physiological function of young children. The average heart rate at rest of 3~6 years old young children tended to decline as age increased. The average resting heart rate of boys and girls ranged from 99.0~93.2 and 100.1~92.2 times/minute, respectively. No significant difference between genders in the resting heart rate was seen (figure 2-1-1-23, table 3-1-4-1).

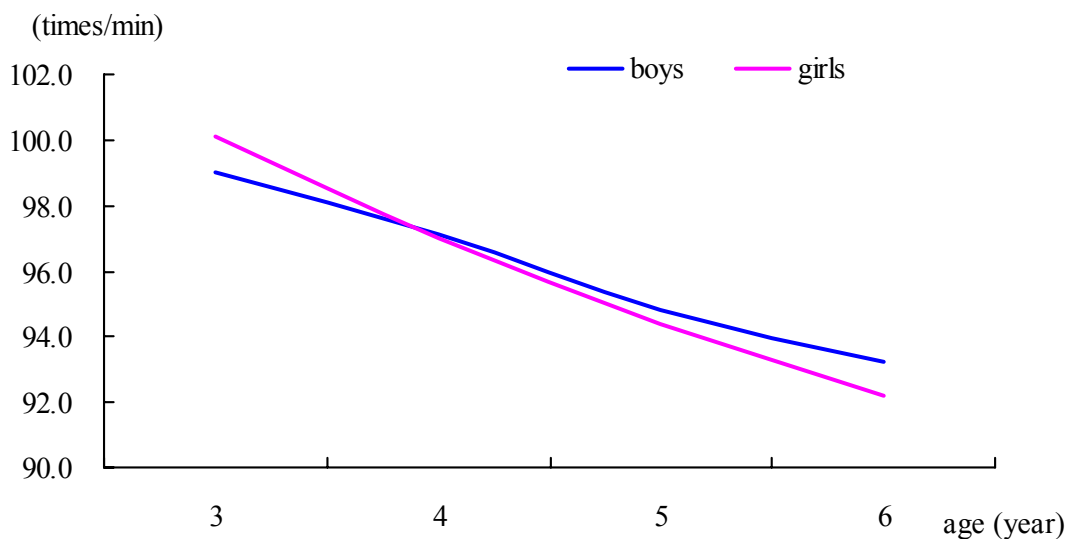


Figure 2-1-1-23 Average resting heart rate of young children

1.1.5. Physical Fitness

1.1.5.1. Speed and sensitivity

Speed and sensitivity were reflected by 10-m shuttle run and successive jump with both feet.

The average time for the 10-m shuttle run and successive jump with both feet for boys ranged from 6.6~9.8 seconds and 6.9~12.6 seconds, respectively. The 10-m shuttle run and successive jump of girls ranged from 6.8~10.1 seconds and 6.9~12.4 seconds, respectively (table 3-1-5-1 and table 3-1-5-2). Significant difference in the 10-m shuttle run and successive jump of the same gender was seen among different age groups ( $p < 0.05$ ). No significant difference in the 10-m shuttle run and successive jump between genders was found. The results showed that the speed and sensitivity of young children tended to increase with age. The sensitivity of boys and girls was fairly similar, but boys had faster speed than girls (figure 2-1-1-24 and figure 2-1-1-25).

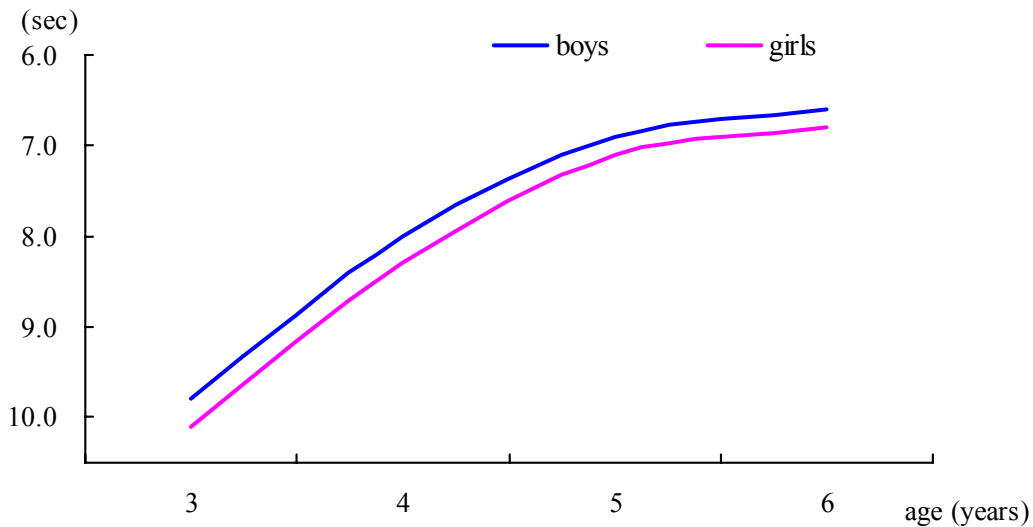


Figure 2-1-1-24 Average time of 10-meter shuttle run of young children

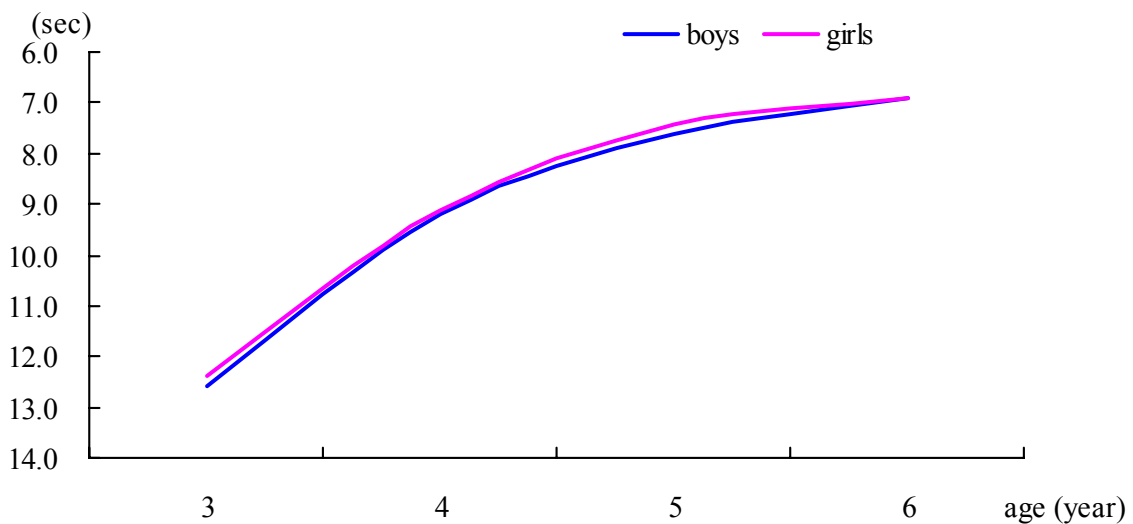


Figure 2-1-1-25 Average time of successive jump with both feet of young children

1.1.5.2. Strength

Strength of young children was reflected by standing long jump and tennis ball distance throw.

The average standing long jump and tennis ball distance throw of the boys ranged from 52.7~103.0 cm and 2.7~6.3 m, respectively; those of the girls ranged from 46.9~96.2 cm and 2.2~5.3 m (table 3-1-5-3 and table 3-1-5-4), respectively. There was a significant difference in standing long jump and tennis throw of the same gender among different age groups ( $p < 0.05$ ). The average standing long jump and tennis throw of boys were significantly higher than girls among all age groups, and there was a significant difference in the tennis ball distance throw ( $p < 0.05$ ). The results showed that the strength of both boys and girls tended to increase with age. The strength of boys was better than girls (figure 2-1-1-26 and figure 2-1-1-27).

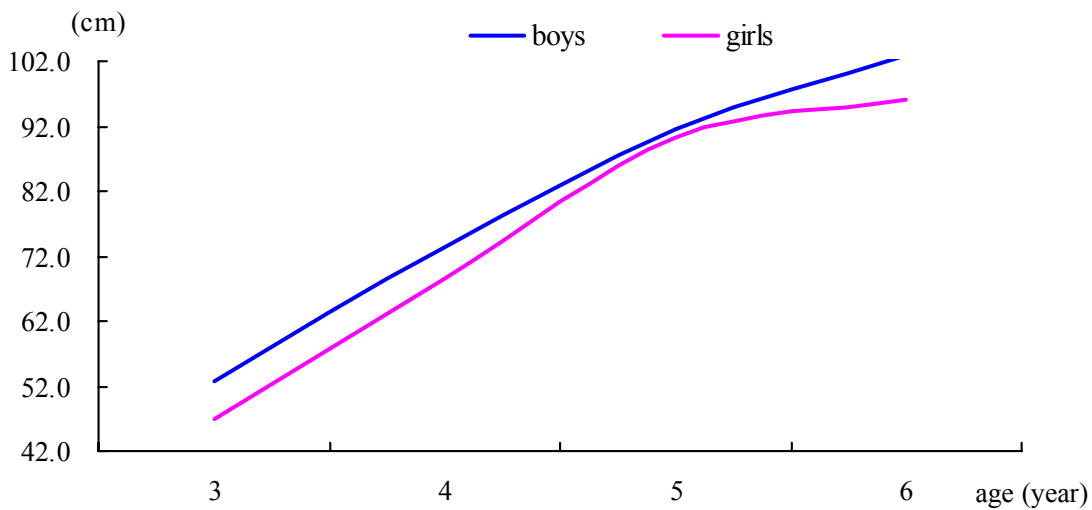


Figure 2-1-1-26 Average standing long jump of young children

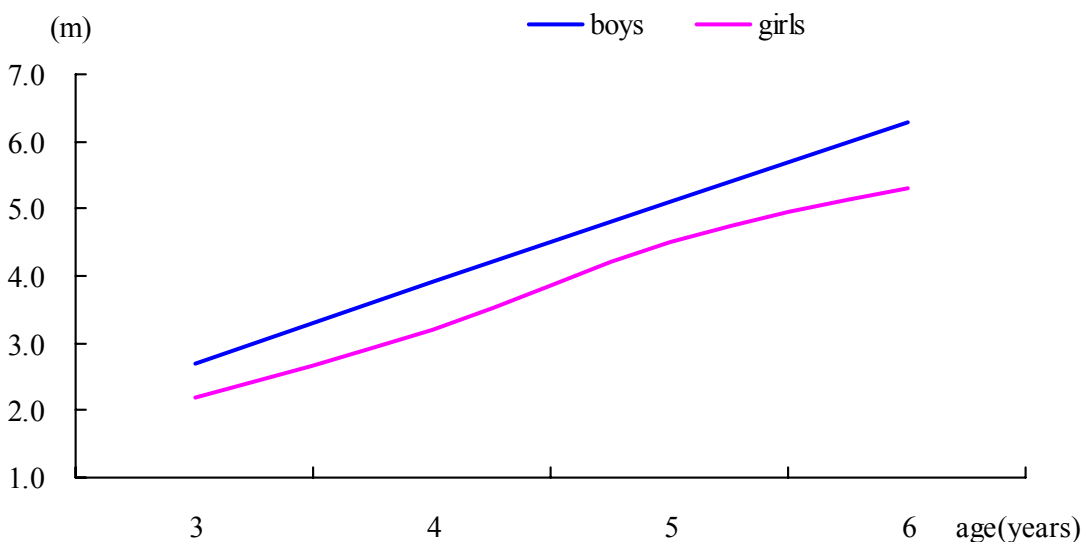


Figure 2-1-1-27 Average tennis ball distance throw of young children

1.1.5.3. Flexibility

Sit and reach reflects flexibility.

The average sit and reach of boys and girls ranged from 5.1~8.4 cm and 7.8~10.7 cm, respectively. Young children at age3 had the highest flexibility and young children at age6 had the lowest flexibility, which indicated that flexibility declined as age increased, with a nearly 40 % decrease. The rate of decrease accelerated after age 5 (table 3-1-5-5).

The change in flexibility at different ages varied in the same way in both boys and girls. Girls had a significantly higher flexibility than boys in all age groups (P < 0.05), which indicated that the flexibility of girls was apparently better than boys (figure 2-1-1-28).

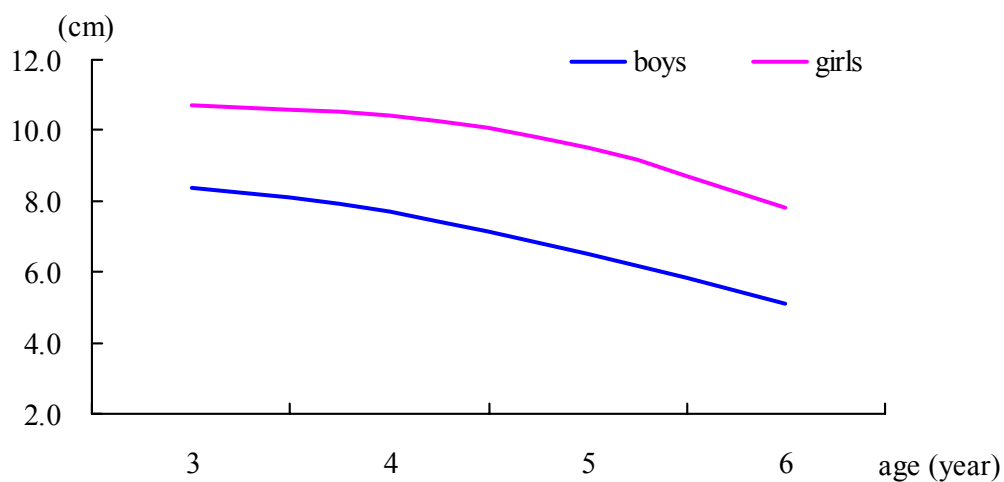


Figure 2-1-1-28 Average sit and reach of young children

1.1.5.4. Balance

The balance of young children was reflected by walking on balance beam. The manner of walking on balance beam and the time necessary to finish walking were used to examine the balance of young children.

In terms of manner of walking on balance beam, 72.0 % of boys and 81.4% of girls at age 3 were able to finish the test normally (moving forward). At age 6, 2 % of boys were unable to finish the test normally (table 2-1-1-2).

Table 2-1-1-2 Proportion of young children on the manner of walking on balance beam (%)

Gender	Manner of walking	Age (year)				Total
		3 years	4 years	5 years	6 years	
Boys	Moving forward	72.0	91.9	96.3	98.0	88.3
	Moving slowly sideways	21.8	5.9	3.7	2.0	9.3
	Unable to finish	6.2	2.2	0.0	0.0	2.4
Girls	Moving forward	81.4	95.7	97.2	100.0	93.3
	Moving slowly sideways	12.7	0.9	1.9	0.0	4.0
	Unable to finish	5.9	3.4	0.9	0.0	2.8

In terms of completion time on walking normally (moving forward), the average time for boys and girls ranged from 7.0~22.0 seconds and 7.5~22.7 seconds, respectively. Young children at age 3 required the longest time and young children at age 6 required the shortest time to complete, indicating that balance ability improved as age increased, and the increase was nearly 3 folds. The balance ability of boys and girls tended to vary in the same way without a significant difference between genders, which showed that the balance ability of boys and girls was basically the same (figure2-1-1-29, 3-1-5-6).

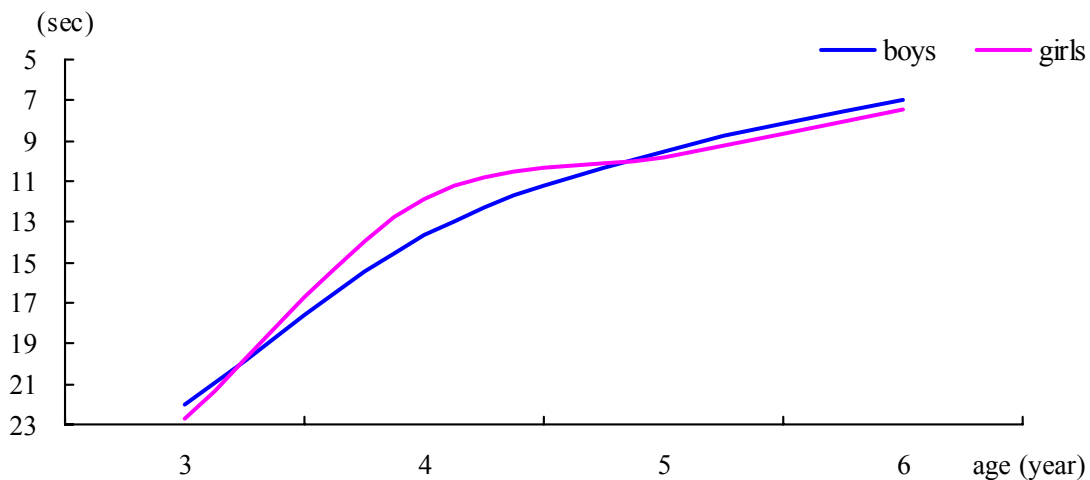


Figure 2-1-1-29 Average time of walking on balance beam of young children

## 1.1.6. Health

### 1.1.6.1. Occurrence of decayed primary teeth

Occurrence of decayed primary teeth was reflected by the proportion of decayed primary teeth (%), the proportion of decayed primary teeth loss (%), the proportion of decayed primary teeth filled (%) and total proportion of primary teeth decayed, loss and filled (%). The proportion of primary teeth decayed (d) meant the percentage of subjects having primary teeth decayed. And the proportion of primary teeth loss (m) referred to the percentage of primary teeth loss before the age of substitution due to caries. The proportion of decayed primary teeth filled (f) referred to the percentage of primary teeth filled. The proportion of primary teeth decayed, loss and filled (dmf) referred to the total percentage of decay, loss and filled of primary teeth.

The proportion of boys and girls at age 3~6 having primary teeth decayed increased gradually with age. The change in the proportion of primary teeth decayed was similar in boys and girls. A significant difference in the proportion of primary teeth decayed was found among different age groups ( $P < 0.05$ ). From age 3 to age 6, there were 20.8 % and 23.3 % increase of primary teeth decayed in boys and girls, respectively. The change in primary teeth decayed ranged from 42.5%~63.3 % and 39.3%~63.5 % in boys and girls, respectively (table 3-1-6-1).

No significant difference between genders in the proportion of primary teeth decayed was observed. The proportion of primary teeth decayed was higher in boys than girls at age 3 and 4. However, girls had more primary teeth decayed than boys at age 5 and 6 (figure 2-1-1-30).

The proportion of primary teeth filled (f) increased with age. For boys, the proportion was 3.6 %, 3.2 %, 9.5 % and 15.3 % at age 3, 4, 5 and 6, respectively. For girls, the proportion of primary teeth filled (f) reached 3.9%, 4.3%, 10.3% and 13.5% at age 3, 4, 5 and 6 (table 2-1-1-31).

The proportion of decayed primary teeth loss (m) increased with age for boys, with the highest proportion of 3.2% at age 5 and dropped to 1.0 % at age 6. The proportion of decayed primary teeth loss (m) increased with age for girls, with the highest proportion of 2.7% at age 6. Significant difference among age groups was found ( $p < 0.05$ ) (figure 2-1-1-32).

The proportion of primary teeth decayed, loss and filled (dmf) increased significantly with age. The proportion for boys increased from 44.0 % at age 3 to 65.3 % at age 6, with an increase of 21.3 %. The trend of change in girls was similar to boys. The proportion of dmf increased gradually from 40.2 % at age 3 to 64.9% % at age 6, with an increase of 24.7 % (figure 2-1-1-33).

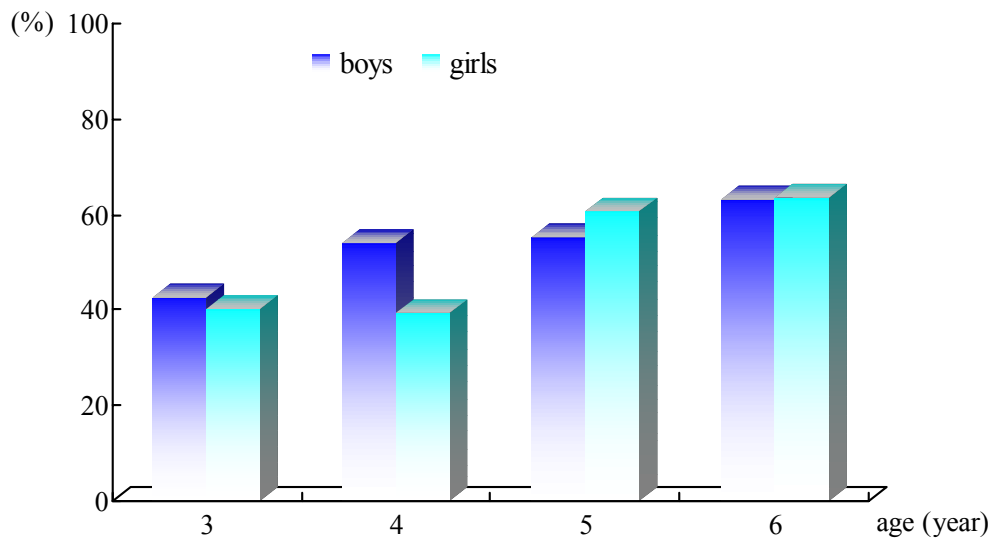


Figure 2-1-1-30 Proportion of primary teeth decayed in young children



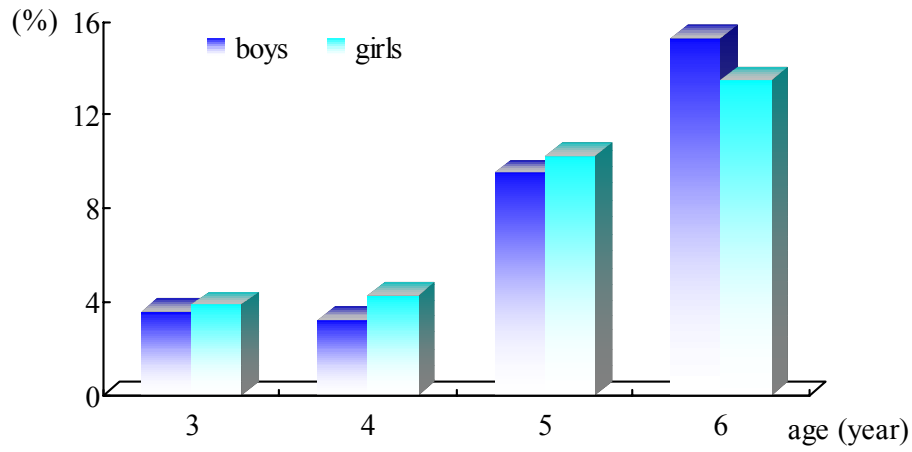


Figure 2-1-1-31 Proportion of primary teeth filled in young children

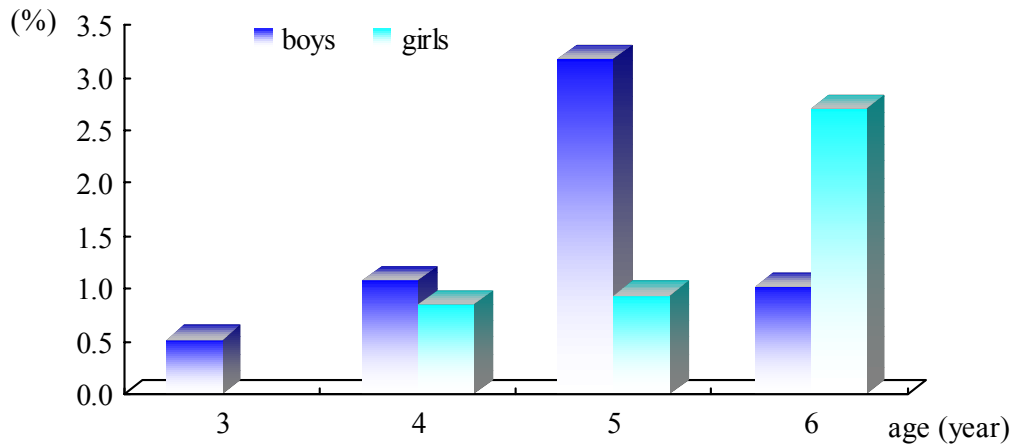


Figure 2-1-1-32 Proportion of decayed primary teeth loss in young children

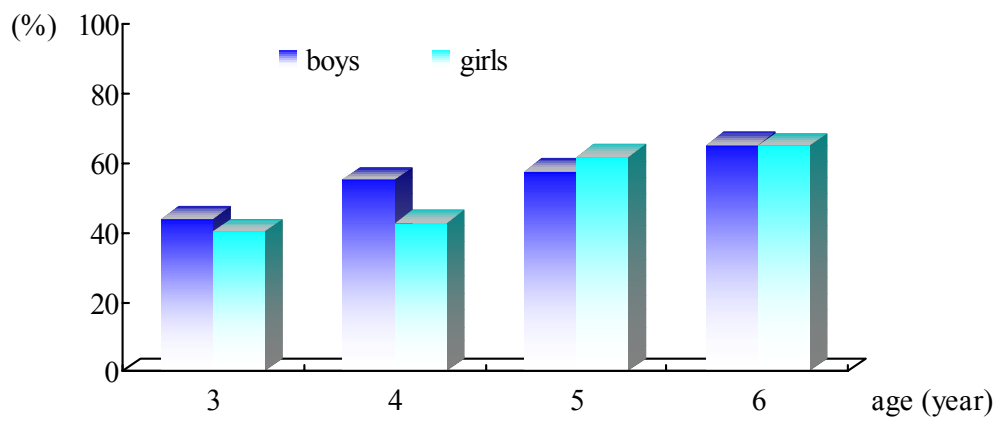


Figure 2-1-1-33 Proportion of primary teeth decayed, loss and filled (dmf) in young children

**1.1.6.2. Occurrence of decayed permanent teeth**

Occurrence of decayed permanent teeth was reflected by the proportion of decayed permanent teeth (%), loss of decayed permanent teeth (%), decayed permanent teeth filled (%) and the proportion of decayed, permanent teeth loss and filled (%). The proportion of permanent teeth decayed (D) referred to the percentage of subjects having permanent teeth decayed. The proportion of decayed permanent teeth loss (M) referred to the percentage of permanent teeth loss before the age of substitution due to caries. The proportion of decayed permanent teeth filled (F) referred to the percentage of permanent teeth filled. The proportion of permanent teeth decayed, loss and filled (DMF) referred to the total percentage of decayed, loss and filled of permanent teeth.

The proportion of decayed, loss and filled permanent teeth which appeared after age 5 accounted for about 0.5%~3.1%,. No significant difference between genders was seen and no occurrence of decayed permanent teeth filled was found (table 3-1-6-2).

**1.2. Comparison of 2005 and 2010 Results on the Physical Fitness Study of Macao Young Children**

**1.2.1. Comparison of Basic Information of the Subjects**

1044 and 1065 samples were drawn randomly for the 2005 and 2010 physical fitness study of Macao young children. The sampling sites were kept consistence.

**1.2.2. Comparison of Lifestyle**

**1.2.2.1. Birth and feeding methods**

Study results of 2005 and 2010 showed that average birth weight of boys in each age group in 2010 decreased by 0.1 kg (p<0.05). No significant change was seen in the average birth weight of girls in each age group. Birth length of boys in each age group decreased by 0.5 cm (p<0.05), and the average birth length of girls in each age group decreased by 0.7 cm (p<0.05).

The proportion of boys who were breast-fed and mixed-fed increased by 2.9 % and 9.0 % in 2010 compared with that in 2005, and those who were formula-fed decreased by 11.9 %. The proportion of girls who were breast-fed and mixed-fed increased by 5.4% and 5.9%, and those who were formula-fed decreased by 11.2 % (table 2-1-2-1).

**Table 2-1-2-1 Comparison of feeding methods in young children (%)**

Feeding methods	M			F		
	2005	2010	Difference	2005	2010	Difference
Breast feeding	9.2	12.1	2.9*	11.2	16.6	5.4*
Formula feeding	69.2	57.3	-11.9*	63.2	52.0	-11.2*
Mixed feeding	21.6	30.6	9.0*	25.5	31.4	5.9*

Note: Difference equals to data in 2010 minus data in 2005. \* is the comparison result of the two studies in which p<0.05. This calculation method applies to subsequent tables.

**1.2.2.2. Habits**

Information about habits that were examined included accumulated hours of sleeping (included nap time), average accumulated hours of outdoor activities, average hours of indoor activities such as watching TV, video and playing computer games and participation in extracurricular activities per day(hobby class).

Results in the two studies showed that the average sleeping hours of young children changed slightly. Compared with the results in 2005, young children who spent less than 30 minutes in outdoor activities increased by 5.9 % in 2010, 30 minutes~1 hours increased by 2.2%, 1~2 hours decreased by 4.6 %, and those who spent over 2 hours decreased by 3.5 %. The accumulated hours of outdoor activities tended to decrease (table 2-1-2-2); however, the proportion of young children participated in extracurricular activities increased by 9.6% in 2010.

**Table 2-1-2-2 Comparison of average daily hours spent on outdoor activities in young children (%)**

Year	Less than 30 minutes	30 minutes—1 hour	1—2 hours	2 hours or more
2005	25.0	40.2	24.6	10.2
2010	30.9	42.4	20.0	6.7
Difference	5.9*	2.2*	-4.6*	-3.5*

**1.2.2.3. Physical exercise**

Results in the two studies showed that biking, swimming, dancing, ball games and gymnastics were the top five sports with highest participation (table 2-1-2-3). There was a difference in the type of sports that boys and girls often participated. Biking accounted for the highest proportion that boys participated, whereas dancing accounted for the highest proportion in girls in both 2010 and 2005.

**Table 2-1-2-3 Comparison of physical exercises in young children (%)**

Year	Swimming	Track and field	Ball games	Gymnastics	Dancing	Rope skipping	Martial arts etc.	Biking	Others
2005	18.9	10.1	19.3	16.7	13.5	3.9	3.6	28.8	37.1
2010	23.5	12.1	24.0	17.4	19.5	6.1	3.0	41.2	20.2
Difference	4.6	2.0	4.7	0.7	6.0	2.2	-0.6	12.4	-16.9

**1.2.2.4. Occurrence of diseases**

Results in the two studies showed that no significant difference was found in the occurrence of diseases among young children having a cold or fever in the previous year. However, the occurrence of illness in 2010 decreased by 3.7 % compared to 2005 (p<0.05) (table 2-1-2-4).

**Table 2-1-2-4 Comparison of diseases in young children (%)**

Year	Disease	No disease
2005	23.8	76.2
2010	20.1	79.9
Difference	-3.7*	3.7*

**1.2.3. Comparison of Anthropometric Measurements**

**1.2.3.1. Length**

Results in the two studies showed that height, sitting height and foot length of boys and girls increased with age. No significant difference was found in the average height, sitting height and foot length of girls. There was no significant difference in the average height of boys, whereas significant difference was seen in the average sitting height of boys at age 4 and 6 ( $p < 0.05$ ). The average sitting heights of boys in 2010 aged 4 and 6 were 0.7 cm and 1 cm, respectively higher than the results in 2005. Significant difference was seen in the average foot length of boys in the 3, 4 and 6 age groups, and the average foot length of boys in the 3, 4 and 6 age groups in 2010 were 0.3 cm, 0.3 cm and 0.4 cm respectively higher than 2005 (table 2-1-2-5~table 2-1-2-7).

**Table 2-1-2-5 Comparison of average height in young children (cm)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
3 years	99.3	99.8	0.5	97.1	98.2	1.1
4 years	105.5	106.2	0.7	104.6	105.1	0.5
5 years	112.0	111.9	-0.1	111.7	110.9	-0.8
6 years	117.6	119.2	1.6	116.8	118.0	1.2

**Table 2-1-2-6 Comparison of average sitting height in young children(cm)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
3 years	57.3	57.4	0.1	56.1	56.3	0.2
4 years	59.7	60.4	0.7*	59.2	59.4	0.2
5 years	62.3	62.3	0.0	61.7	62.0	0.3
6 years	64.5	65.5	1.0*	63.9	64.5	0.6

**Table 2-1-2-7 Comparison of average foot length in young children (cm)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
3 years	15.6	15.9	0.3*	15.1	15.2	0.1
4 years	16.5	16.8	0.3*	16.2	16.2	0.0
5 years	17.5	17.5	0.0	17.2	17.1	-0.1
6 years	18.1	18.5	0.4*	17.9	18.1	0.2

**1.2.3.2. Weight and BMI**

Weight of boys and girls in the two studies increased with age. The average weight and BMI index of boys and girls changed slightly. Significant difference was seen in the average weight of boys aged 4 and 6 ( $p < 0.05$ ), an increase of 0.6 kg and 1.4 kg respectively was observed in 2010 compared with 2005 (table 2-1-2-8 and table 2-1-2-9).

Results in the two studies showed that no significant difference was found in the rate of obesity of boys and girls in spite of the large difference in several age groups (table 2-1-2-10).

**Table 2-1-2-8 Comparison of average weight in young children (kg)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
3 years	15.3	15.7	0.4	14.6	15.1	0.5
4 years	17.1	17.7	0.6*	17.0	17.2	0.2
5 years	19.5	19.6	0.1	19.0	18.8	-0.2
6 years	21.4	22.8	1.4*	20.8	21.6	0.8

**Table 2-1-2-9 Comparison of average BMI in young children**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
3 years	15.5	15.6	0.1	15.5	15.5	0.0
4 years	15.4	15.6	0.2	15.5	15.5	0.0
5 years	15.5	15.6	0.1	15.2	15.2	0.0
6 years	15.4	15.9	0.5	15.2	15.4	0.2

**Table 2-1-2-10 Comparison of obesity rate in young children (%)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
3 years	6.3	5.2	-1.1	1.1	4.9	3.8
4 years	7.9	13.5	5.6	7.1	6.8	-0.3
5 years	11.5	11.6	0.1	5.3	7.5	2.2
6 years	15.3	15.3	0.0	2.2	6.8	4.6

**1.2.3.3. Circumference indexes**

Results in the two studies showed that the chest, waist and hip circumferences tended to increase with age and this was consistent in both boys and girls. There was significant difference in the results of the two studies in the waist and hip circumferences of boys and girls at age 3 ( $p < 0.05$ ). The average waist circumferences in 2010 were 0.8 cm (boys) and 2.1 cm (girls) higher than the results in 2005, and the average hip circumferences in 2010 were 1.0 cm (boys) and 1.6 cm (girls) higher than the results in 2005. The hip circumferences of boys aged 4 and 6 in 2010 were 0.9 cm and 2.5 cm higher than the results in 2005 ( $p < 0.05$ ). The waist circumference of girls aged 4 increased by 1.6 cm in 2010 than that in 2005 ( $p < 0.05$ ), and the waist and hip circumferences of girls aged 6 increased by 1.6 cm ( $p < 0.05$ ). Results in the two studies showed that no significant difference was found in the WHR (table 2-1-2-11~table 2-1-2-14).

**Table 2-1-2-11 Comparison of average chest circumference in young children (cm)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
3 years	51.5	51.7	0.2	50.5	50.5	0.0
4 years	53.3	53.6	0.3	52.5	52.4	-0.1
5 years	55.6	55.4	-0.2	54.3	53.8	-0.5
6 years	57.0	58.1	1.1	55.8	56.7	0.9

**Table 2-1-2-12 Comparison of average waist circumference in young children (cm)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
3 years	48.0	48.8	0.8*	46.4	48.5	2.1*
4 years	49.7	50.4	0.7	48.2	49.8	1.6 *
5 years	51.6	51.6	0.0	49.6	50.2	0.6
6 years	53.1	54.7	1.6	51.0	52.6	1.6*

**Table 2-1-2-13 Comparison of average hip circumference in young children (cm)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
3 years	52.3	53.3	1.0*	51.6	53.2	1.6*
4 years	54.9	55.8	0.9*	54.9	55.9	1.0
5 years	57.7	58.1	0.4	57.4	57.7	0.3
6 years	60.0	62.5	2.5*	59.2	60.8	1.6*

**Table 2-1-2-14 Comparison of average WHR in young children**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
3 years	0.916	0.918	0.002	0.900	0.912	0.012
4 years	0.905	0.902	-0.003	0.879	0.891	0.012
5 years	0.893	0.889	-0.004	0.865	0.870	0.005
6 years	0.884	0.874	-0.010	0.862	0.863	0.001

**1.2.3.4. Width indexes**

Results in the two studies showed that the shoulder and pelvis width of boys and girls increased with age. Compared the results in the two studies, significant difference was found in shoulder and pelvis width of boys in all age groups except in the aged 6 group ( $p < 0.05$ ), of which the average shoulder width decreased by 0.9 cm (aged 3 group), 0.9 cm (aged 4 group) and 0.6 cm (aged 5 group). Average pelvis width decreased by 0.5 cm (aged 3 group), 0.4 cm (aged 4 group) and 0.4 cm (aged 5 group). Pelvis width of girls in the four age groups in 2010 increased by 0.4 cm (aged 3 group), 0.7 cm (aged 4 group), 0.6 cm (aged 5 group) and 0.8 cm (aged 6 group) compared with that in 2005 ( $p < 0.05$ ). Results in the two studies showed that the shoulder width of girls at age 6 increased by 0.5 cm in 2010 compared with that in 2005 ( $p < 0.05$ ) (table 2-1-2-15 and 2-1-2-16).

**Table 2-1-2-15 Comparison of average shoulder width in young children (cm)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
3 years	22.4	21.5	-0.9*	21.9	21.9	0.0
4 years	23.6	22.7	-0.9*	23.1	23.4	0.3
5 years	24.7	24.1	-0.6*	24.4	24.1	-0.3
6 years	25.6	25.4	-0.2	25.0	25.5	0.5*

**Table 2-1-2-16 Comparison of average pelvis width in young children (cm)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
3 years	16.5	16.0	-0.5*	15.5	15.9	0.4*
4 years	17.2	16.8	-0.4*	16.2	16.9	0.7*
5 years	18.0	17.6	-0.4*	16.9	17.5	0.6*
6 years	18.6	18.6	0.0	17.6	18.4	0.8*

**1.2.3.5. Body composition**

The results in the two studies not only showed that the difference between the increases in average upper arm, subscapular and abdominal skinfold thickness of boys decreased with age, it also showed that the difference between boys and girls decreased with age as well. In addition, although no significant difference was seen in several age groups, the skinfold thickness of boys in 2010 was lower than that in 2005. The average skinfold thickness of all three sites of boys at age 3 in 2010 decreased by 0.7 mm, 2.1 mm and 1.2 mm, respectively compared with that in 2005 ( $p < 0.05$ ). The average subscapular skinfold thickness of boys at age 4 in 2010 decreased by 1.9 mm compared with that in 2005 ( $p < 0.05$ ). The average skinfold thickness of all the three sites of boys at age 5 in 2010 decreased by 1.6 mm, 2.0 mm and 1.7 mm compared with that in 2005 ( $p < 0.05$ ). The average upper arm and subscapular skinfold thickness of boys at age 6 in 2010 decreased by 1.4 mm and 1.9 mm compared with that in 2005 ( $p < 0.05$ ). The results in the two studies showed that the subscapular skinfold thickness of girls in four age groups in 2010 decreased by 1.7 mm, 1.9 mm, 2.4 mm and 1.6 mm compared with that in 2005 ( $p < 0.05$ ). The results in the two studies also showed that average skinfold thickness of all three sites of girls were higher than that of boys, and the difference between both sexes tended to decrease with age (table 2-1-2-17~table 2-1-2-19).

**Table 2-1-2-17 Comparison of average upper arm skinfold thickness in young children (mm)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
3 years	8.4	7.7	-0.7*	10.0	10.8	0.8*
4 years	8.8	8.3	-0.5	10.5	10.9	0.4
5 years	9.5	7.9	-1.6*	10.5	10.9	0.4
6 years	9.9	8.5	-1.4*	10.1	10.0	-0.1

**Table 2-1-2-18 Comparison of average subscapular skinfold thickness in young children (mm)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
3 years	5.7	3.6	-2.1*	7.8	6.1	-1.7*
4 years	5.7	3.8	-1.9*	8.4	6.5	-1.9*
5 years	6.2	4.2	-2.0*	8.1	5.7	-2.4*
6 years	6.5	4.6	-1.9*	7.6	6.0	-1.6*

**Table 2-1-2-19 Comparison of average abdominal skinfold thickness in young children (mm)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
3 years	5.3	4.1	-1.2*	7.0	6.9	-0.1
4 years	5.9	4.7	-1.2	8.5	7.9	-0.6
5 years	7.0	5.3	-1.7*	8.5	7.4	-1.1
6 years	8.1	6.4	-1.7	8.5	8.4	-0.1

**1.2.4. Comparison of Physiological Function**

The results of the two studies showed that the average resting heart rate of boys and girls at age 3~6 in 2010 was significantly lower than that in 2005 ( $p < 0.05$ ). The average heart rate of boys decreased by 7.8 times/minute (aged 3), 8.3 times/minute (aged 4), 8.2 times/minute (aged 5), and 3.9 times/minute (aged 6), while the average resting heart rate of girls decreased by 6.6 times/minute (aged 3), 6.8 times/minute (aged 4), 7.9 times/minute (aged 5) and 4.3 times/minute (aged 6). No significant difference was found in the average resting heart rate of boys and girls (table 2-1-2-20).

**Table 2-1-2-20 Comparison of average resting heart rate in young children (times/minute)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
3 years	106.8	99.0	-7.8*	106.7	100.1	-6.6*
4 years	105.4	97.1	-8.3*	103.8	97.0	-6.8*
5 years	103.0	94.8	-8.2*	102.3	94.4	-7.9*
6 years	97.1	93.2	-3.9*	96.5	92.2	-4.3*

**1.2.5. Comparison of Physical Fitness**

**1.2.5.1. Speed and sensitivity**

The comparison of the results in the two studies showed that significant difference was seen in the average 10-m shuttle run of boys and girls in the 4 and 5 year age groups ( $p < 0.05$ ). In the 4 year age group, the average time decreased by 0.3 second for boys and 0.4 second for girls in 2010 compared with that in 2005, and in the 5 year age group, the average time decreased by 0.4 second for boys and 0.6 second for girls in 2010. There was significant difference in the average time for successive jump with both feet, time decreased by 0.8 second for boys and 1.3 second for girls in the 4 year age group ( $p < 0.05$ ). The results in the two studies showed that speed and sensitivity increased with age (table 2-1-2-21 and table 2-1-2-22).

**Table 2-1-2-21 Comparison of average time of 10-m shuttle run in young children (sec)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
3 years	9.9	9.8	-0.1	10.1	10.1	0.0
4 years	8.3	8.0	-0.3*	8.7	8.3	-0.4*
5 years	7.3	6.9	-0.4*	7.7	7.1	-0.6*
6 years	6.6	6.6	0.0	6.9	6.8	-0.1



**Table 2-1-2-22 Comparison of average time of successive jump with both feet in young children (sec)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
3 years	13.4	12.6	-0.8	12.8	12.4	-0.4
4 years	10.0	9.2	-0.8*	10.4	9.1	-1.3*
5 years	7.6	7.6	0.0	7.9	7.4	-0.5
6 years	6.7	6.9	0.2	6.8	6.9	0.1

**1.2.5.2. Strength**

Comparison of results in the two studies showed that there were differences only in the average standing long jump of boys at age 4 and girls at age 5, and in the average tennis ball distance throw of boys at age 5 ( $p < 0.05$ ). The average standing long jump of boys at age 4 in 2010 increased by 4.3 cm compared with 2005, and the average of girls at age 5 in 2010 increased by 4.2 cm. The average tennis ball distance throw of boys at age 5 in 2010 decreased by 0.6 m compared 2005. The results in the two studies showed that the strength of boys and girls tended to increase with age. The strength of boys was better than girls (table 2-1-2-23 and table 2-1-2-24).

**Table 2-1-2-23 Comparison of average standing long jump in young children (cm)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
3 years	55.6	52.7	-2.9	51.5	46.9	-4.6
4 years	69.0	73.3	4.3*	64.5	68.6	4.1
5 years	92.6	91.6	-1.0	86.0	90.2	4.2*
6 years	99.7	103.0	3.3	92.4	96.2	3.8

**Table 2-1-2-24 Comparison of average tennis ball distance throw in young children (m)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
3 years	2.9	2.7	-0.2	2.4	2.2	-0.2
4 years	4.0	3.9	-0.1	3.4	3.2	-0.2
5 years	5.7	5.1	-0.6*	4.4	4.5	0.1
6 years	6.0	6.3	0.3	5.3	5.3	0.0

**1.2.5.3. Flexibility**

Comparison of the results in two studies showed that there was significant difference in the average sit and reach in girls at age 4 only ( $p < 0.05$ ), and the average increased by 1.9 cm in 2010 compared 2005. The trend of 2005 and 2010 results of both sexes were fairly consistence and showed that the flexibility of girls was significantly better than that of boys. (table 2-1-2-25).

**Table 2-1-2-25 Comparison of average sit and reach in young children (cm)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
3 years	8.0	8.4	0.4	9.4	10.7	1.3
4 years	7.5	7.7	0.2	8.5	10.4	1.9*
5 years	7.1	6.5	-0.6	9.5	9.5	0.0
6 years	4.5	5.1	0.6	6.4	7.8	1.4

**1.2.5.4. Balance**

In terms of manner of walking on balance beam, 94.3% of boys were able to finish the test normally in 2005 and the completion proportion decreased to 88.3% in 2010, while the proportion of girls decreased from 94.2% in 2005 to 93.3%. In comparison of the average normal completion time in 2010 with 2005, the time for boys in the 3, 4, 5, and 6 year age groups increased by 3.3 seconds, 2.6 seconds, 2.7 seconds and 1.3 seconds ( $p < 0.05$ ), and the time for girls in the 5 and 6 age groups increased by 3.4 seconds and 1.6 seconds ( $p < 0.05$ ). The above aspects showed that the balance of boys and girls decreased in 2010 when compared with 2005 (table 2-1-2-26).

**Table 2-1-2-26 Comparison of average time to finish walking normally on balance beam in young children (sec)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
3 years	18.7	22.0	3.3 *	17.3	22.7	5.4
4 years	11.1	13.7	2.6 *	12.3	11.9	-0.4
5 years	6.8	9.5	2.7*	6.4	9.8	3.4 *
6 years	5.7	7.0	1.3 *	5.9	7.5	1.6 *

**1.2.6. Comparison of Health Status**

**1.2.6.1. Occurrence of decayed primary teeth**

The results in the two studies showed that the proportion of primary teeth decayed of boys and girls increased gradually with age, and the trend was fairly consistent in boys and girls. The proportion of primary teeth decayed of boys and girls was significantly higher in 2010 than 2005 ( $p < 0.05$ ). The proportion of primary teeth decayed of young children in 2010 ranged from 42.5%~63.3% for boys and 39.3%~63.5% for girls, whereas the proportion of primary teeth decayed of young children in 2005 ranged from 19.5%~45.9% for boys and 17.7%~43.3% for girls (table 2-1-2-27).

**Table 2-1-2-27 Comparison of primary teeth decayed in young children (%)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
3 years	19.5	42.5	23.0 *	17.7	40.2	22.5 *
4 years	27.2	54.1	26.9*	32.7	39.3	6.6 *
5 years	40.0	55.0	15.0*	40.9	60.7	19.8*
6 years	45.9	63.3	17.4*	43.3	63.5	20.2*

The proportion of decayed primary teeth filled increased gradually with age, and was significantly higher in 2010 than 2005 for both boys and girls except in boys aged 4 (  $p < 0.05$ ). The proportion of decayed primary teeth filled of young children in 2010 ranged from 3.2%~15.3% for boys and 3.9%~13.5% for girl, whereas the proportion of decayed primary teeth filled ranged from 0~5.1% for boys and 0~5.6% for girls (table 2-1-2-28).

**Table 2-1-2-28 Comparison of decayed primary teeth filled in young children (%)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
3 years	0.0	3.6	3.6 *	0.0	3.9	3.9*
4 years	4.2	3.2	-1.0*	0.9	4.3	3.4*
5 years	1.8	9.5	7.7 *	3.8	10.3	6.5*
6 years	5.1	15.3	10.2*	5.6	13.5	7.9*

The proportion of decayed primary teeth loss of young children tended to increase with age. The sign of decayed primary teeth loss appeared at age 3 for boys in 2010, and the proportion of decayed primary teeth loss of boys in the 4 and 5 year age groups in 2010 was higher than 2005, but the proportion of decayed primary teeth loss of boys in the 6 year age group in 2005 was 9 times as that in 2010. Between aged 4~6, the proportion of decayed primary teeth loss of girls in 2010 was lower than 2005. The proportion of decayed primary teeth loss of girls in 2005 was 3 times as that in 2010 (table 2-1-2-29).

**Table 2-1-2-29 Comparison of decayed primary teeth loss in young children (%)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
3 years	0.0	0.5	0.5*	0.0	0.0	0.0
4 years	0.5	1.1	0.6*	0.9	0.9	0.0
5 years	3.0	3.2	0.2	3.0	0.9	-2.1*
6 years	9.2	1.0	-8.2*	3.3	2.7	-0.6*

The two study results showed that the proportion of primary teeth decayed, loss and filled tended to increase with age for both boys and girls, and the proportion of primary teeth decayed, loss and filled in 2010 was significantly higher than that in 2005 for boys and girls (  $p < 0.05$ ). The proportion of primary teeth decayed, loss and filled of young children in 2010 ranged from 44.0%~65.3% for boys and 40.2%~64.9% for girls, while proportion of primary teeth decayed, loss and filled of young children in 2005 ranged from 19.5%~51% for boys and 17.7%~45.6% for girls (table 2-1-2-30).

**Table 2-1-2-30 Comparison of primary teeth decayed, loss and filled in young children (%)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
3 years	19.5	44.0	24.5*	17.7	40.2	22.5*
4 years	28.8	55.1	26.3*	32.7	42.7	10.0*
5 years	40.6	57.7	17.1*	43.2	61.7	18.5*
6 years	51.0	65.3	14.3*	45.6	64.9	19.3*

### 1.2.6.2. Occurrence of decayed permanent teeth

The results in 2010 study showed that the occurrence of decayed permanent teeth ranging from 0.5%~3.1% appeared at age 5 for boys and girls. The results in 2005 study showed that the occurrence of decayed permanent teeth ranging from 1%~2% appeared at age 6 for boys and girls. This showed that the occurrence of decayed permanent teeth appeared at an earlier age. The comparison of the occurrence of decayed permanent teeth of boys and girls in the same age group did not indicate significant difference among genders.

## 1.3. Summary

### 1.3.1. Summary of 2010 Results on the Physical Fitness Study of Young Children

The study results in 2010 showed that the anthropometric measurements including height, weight, chest circumference, waist circumference, hip circumference, shoulder width and pelvis width increased with age. The rate of increase in height and weight was basically-consistence. BMI remained stable while increase in waist circumference was slower than hip circumference, meaning that WHR reduced gradually with age which is a significant characteristic of age.

Physiological function tended to improve with age which was manifested by decreased resting heart rate, but there was no significant difference among genders.

Physical fitness improved with age. Most physical fitness indexes increased between aged 3 and 6. Among physical fitness indexes, balance ability increased the most. No difference among genders in the balance ability and sensibility was found. Girls had a better flexibility than boys, while speed and strength were apparently better in boys.

The occurrence of decayed primary teeth increased gradually with age, as manifested by the proportion of primary teeth decayed, decayed primary teeth filled, decayed primary teeth loss and dmf. The regularity of difference among genders in primary teeth decayed was not obvious. The occurrence of decayed permanent teeth only appeared at age 5 (except the proportion of decayed permanent teeth filled).

### 1.3.2. Comparison of 2010 and 2005 Physical Fitness Study Results of Young Children

Comparison of results in 2005 and 2010 showed that anthropometric measurements of Macao young children aged 3~6 increased with age, evidence of natural growth principle. In the 3~6 year age groups of young children, all anthropometric indexes in 2005 were greater in boys than in girls; however, in the 2010 study, there was no significant difference in shoulder and pelvis width for both boys and girls, and even in some age groups, the average of girls was higher than that of boys. From independent comparison of changes in the two width indexes of girls, the pelvis width of girls in 2010 was significantly higher 2005. In terms of the three length indexes including height, sitting height and foot length, the length indexes of boys in 2010 study tended to be higher than the results in 2005, and no significant difference was found in girls. In circumference indexes, the waist and hip circumferences of girls in 2010 were higher than the results in 2005; the hip circumference of boys and the waist circumference of certain age

groups in 2010 tended to be higher than the results in 2005. The above changes showed that variation tendency of anthropometric measurements of young children in 2010 and 2005 were mainly characterized by the increase of length indexes in boys and the increase of pelvis width, waist and hip circumferences in girls.

The two studies showed that skinfold thickness of the three sites of girls was higher than boys, and the increase tended to decrease with age. The most considerable change was that the skinfold thickness of the three sites of boys in 2010 study was significantly lower than that in 2005, and the subscapular skinfold thickness of girls was significantly lower than that in 2005. Evaluation according to standard weight for height, the obesity rate in boys in 2010 increased by 1.2 % and the rate increased to 2.3% in girls, no significant difference compared with 2005. Possibilities that resulted in changes in anthropometric and body composition were 1) earlier developmental growth of young children, a possibility that may need more development indexes for judgment and measurement, 2) improvement of living standards and changes of environment, living habits and diet may result in partial differences of in anthropometric and body compositions. In addition, the effect of sampling errors shall not be eliminated completely.

Results in the two studies showed that in speed and sensitivity indexes of young children, the averages in individual age groups in 2010 were better than the results in the 2005 study, which indicated that speed and sensitivity of the examined young children in 2010 tended to be better than 2005. Except in several age groups, the compared results of strength and flexibility in the two studies did not show any significant changes. The balance of boys and girls tended to decrease when the two study results were compared. It was noteworthy that balance ability reflected muscle strength and coordination of human body, signal transmission speed of the central nervous system, functions and sensitivity of various sensory organs; therefore, the better the development, the better the balance ability. The decrease in the balance ability of young children might be related to the decreased amount of outdoor activities in young children, and this was proved in the questionnaire part of both studies on the number of hours the young children spent on outdoor activities.

The results in the two studies showed that the proportion of decayed primary teeth, primary teeth filled, decayed primary teeth loss and primary teeth decayed, loss and filled tended to increase gradually with age for both boys and girls, with the same variation tendency for boys and girls. The proportion of decayed primary teeth of boys and girls in 2010 was significantly higher than 2005. The proportion of primary teeth filled in 2010 was significantly higher than 2005 for boys and girls except in the aged 4 group of boys. Comparison of the 2010 and 2005 study results showed that the occurrence of decayed primary teeth of young children began earlier. This indicated that decayed primary teeth developed rapidly; therefore, preventive measures should be carried out more frequently and the decayed primary teeth should be treated promptly.

## 2. Children and Adolescents (Students)

### 2.1. Physical Fitness Conditions of Children and Adolescents (Students) in 2010

#### 2.1.1. Basic Information of the Subjects

The primary and secondary school students were divided into 2 groups according to gender which were further divided into more groups according to age with one year difference in each group. Altogether there were 26 groups in the primary and secondary student category. The university students were divided into 2 groups according to gender, and further divided into age groups with one year difference, with 8 groups altogether.

In the primary and secondary school student category, 1469 subjects (765 males and 704 females) were drawn from Keang Peng School (primary and secondary school sections), Hou Kong Middle School and its affiliated primary school in the north area (Paróquia de Nossa Senhora de Fátima). In the central area (Paróquia de Santo António and Paróquia de S. Lázaro), 1542 subjects (755 males and 787 females) were drawn from Pui Ching Middle School and Chan Sui Ki Perpetual Help College. In the south area (Paróquia da Sé Catedral and Paróquia de S.Lourenço), 1381 subjects (759 males and 622 females) were drawn from Pooi To Middle School (branch school of Praia Grande, primary school section and middle school section) and Estrela do Mar School (headquarter and branch school).

In the university student category, 738 subjects (324 males and 414 females) were drawn from five universities (including subjects from other universities) (table 3-2-1-1). The five universities were University of Macao, Macao University of Science and Technology (Paróquia de Nossa Senhora do Carmo), Macao Polytechnic Institute (Paróquia da Sé Catedral), Kiang Wu Nursing College of Macao (Paróquia de Santo António) and Institute for Tourism Studies (Paróquia de Nossa Senhora de Fátima). The proportion of subjects living in each community was shown in table 3-2-1-2. The number of subjects in each age group was shown in table 2-2-1-1.

**Table 2-2-1-1** Number of children and adolescents (students) subjects

Age group (year)	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Total
Male	104	201	172	202	173	149	196	185	162	188	162	186	143	101	97	95	87	<b>2603</b>
Female	94	159	146	155	147	151	175	159	176	169	187	203	186	128	99	100	93	<b>2527</b>
Total	198	360	318	357	320	300	371	344	338	357	349	389	329	229	196	195	180	<b>5130</b>

Among the 5130 subjects from primary, secondary schools and universities in 2010, 82.7 % males and 82.4 % females were born in Macao, followed by Mainland China, Hong Kong and other countries (regions). The proportion of subjects born in Macao declined whereas the proportion of subjects born in Mainland China increased as age increased. Besides, 96.5 % male and 97.0 % female subjects attended full-day schools, whereas the rest attended half-day schools (table 3-2-1-3, table 3-2-1-4).

2.1.2. Lifestyle

Lifestyle information of the children and adolescents (aged 6~22) was examined. These included habits, physical education at school, extracurricular physical exercise and the occurrence of disease.

2.1.2.1. Habits

For habits, information regarding the following 7 areas was examined: daily accumulated traveling time for back and forth from home to school and transportation means, hours of outdoor activities after school, hours of doing daily homework at home, hours of watching TV, video and playing computer games, average hours of daily sleeping (included nap time) and involvement in extracurricular activities (hobby class) were examined.

The study showed that 64 % of the students took less than 30 minutes daily in traveling back and forth from home to school, with the highest proportion from the 6~12 year age groups which accounted for 73 %. After age 13, the percentage of students taking 30 minutes~1 hour and 1~2 hours increased, without significant difference among genders (table 3-2-2-1, table 3-2-2-2). The transportation means used was significantly different among age groups ( $P < 0.05$ ). Students aged 6~18 went to and returned from school mainly on foot (59.4 %), by bus (23.2 %) with no significant difference between genders. After age 19, most female students went to and returned from school by bus (51.2 %) and on foot (24.3 %), whereas most male students traveled by motorcycle (44.2 %) and bus (34.2 %), with a significant difference between genders ( $P < 0.01$ ) (figure 2-2-1-1, table 3-2-2-3, table 3-2-2-4).

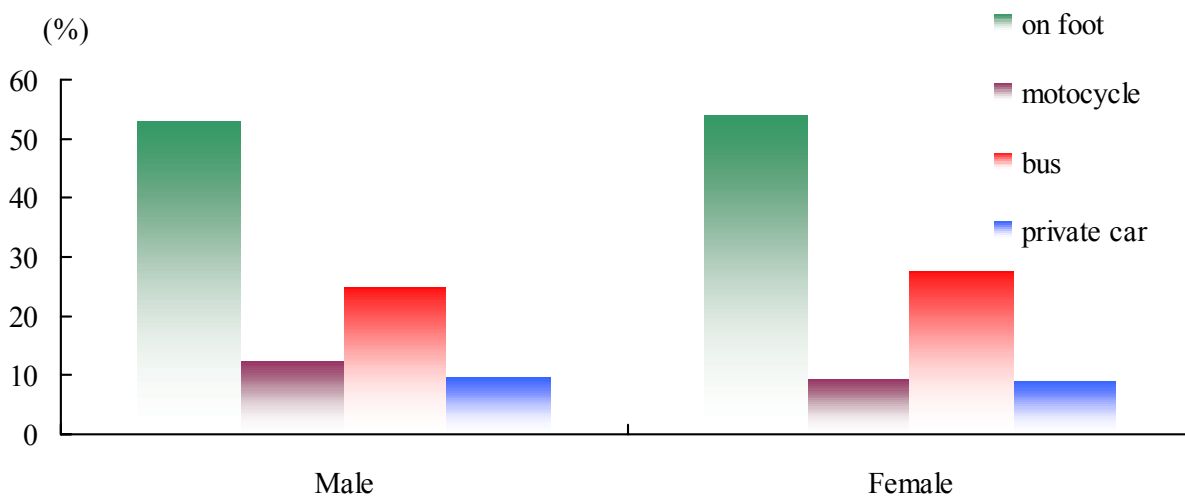


Figure 2-2-1-1 Proportion of transportation means to and from schools in students

Students spending less than 30 minutes daily in outdoor activities after school accounted for the highest proportion(53%), followed by spending 30 minutes~1 hour(27.2%), 1~2 hours(11.9%) and 2 hours or more(7.9%). The proportion of female students spending less than 30 minutes was higher than that of the male students, and the proportion of other choices was lower than that of the male students. Significant difference was seen between genders and among age groups ( $P < 0.01$ )(table 3-2-2-5, table 3-2-2-6).

The proportion of students spending 30 minutes~1 hour daily in doing homework at home accounted for the highest proportion (30.6%), followed by those who spent 1~2 hours (29.7%) and those spending less than 30 minutes (15 %). The proportion of subjects spending 2~3 hours and 3 hours or more were relatively low (15.7% and 9.1%). Among different age groups, the proportion of students aged 6~12 spending less than 30 minutes in doing homework (11.3 %) was lower than that of the 13~18 years old students (16.9%) and 20~22 years old students (20.7)( $P < 0.01$ ). The proportion of aged 6~12 students spending 30 minutes~1 hour (31.5%) was higher than the proportion of students at age13~18 (29.3%) and 20~22 (31.4%)( $P < 0.01$ ). The proportion of aged 6~12 students spending 1~2 hours (31.7%) was higher than the proportion of students aged 13~18 (28.4%) and 20~22 (27.2%) ( $P < 0.01$ ). The proportion of aged 6~12 students spending 2~3 hours (17.4%) was higher than the proportion of students at age13~18 and 20~22 (15.2 % and 11.9 %) ( $P < 0.05$ ). The proportion of aged 6~12 students spending over hours (8.1 %) was lower than the proportion of aged 13~18 and 20~22 students (10.2% and 8.8%) ( $P < 0.05$ ). Female students spending less than 30 minutes (11.8%) in doing homework was less than male students (18.4 %), while female students spending 1~2 hours and 2~3 hours (31.2% and 17.7%) were more than male students (28.2% and 13.6%)( $P < 0.01$ )(table 3-2-2-7,table 3-2-2-8).

Spending 1~2 hours in watching TV, video and playing computer games accounted for the highest proportion (29.7 %), followed by spending 2~3 hours (20.8 %) and 30 minutes~1 hour (20.2 %) with no significant difference between genders. In terms of the order of selection in different age groups, for students at age 6~12, the first three choices were 1~2 hours (31.2 %), 30 minutes~1 hour (30.8 %), 2~3 hours (14.4 %); for students aged 13~18, the first three choices were over 3 hours (29.2 %), 1~2 hours (27.9 %) and 2~3 hours (26.3 %); for students at age19~22, the order was the same with that of students at age13~19, with the proportion of 32.9%, 30.3% and 24%, respectively. There was significant difference among students from primary schools, universities and secondary schools ( $P < 0.01$ ), and no significant difference in students from universities and secondary schools (table 3-2-2-9, table 3-2-2-10).

Having 8~10 hours average daily sleeping hours (included nap time) accounted for 77.7 % of the 6~12 year old students, whereas 66.9 % and 78.5 % were accounted for in the 13~18 year old and 19~22 year old students, respectively. There was significant difference among genders and age in daily sleeping hours. A higher percentage of females had less than 8 hours of sleep than males ( $P < 0.01$ )(table 3-2-2-11, table 3-2-2-12).

Among our student subjects, 67.4 % participated in extracurricular activities (hobby classes), and students participating in music and dancing hobby classes accounted for the highest proportion (27.7 %), followed by participating in sports activities (25.3 %). From the perspective of different genders, the proportion of female students participated in hobby classes (70.2 %) was higher than male students (64.7 %). There was a significant difference in the types of hobby class participated by male and female students. In male students, sports exercises accounted for the highest participation (31.8 %), followed by others, music and dancing, tutoring class, drawing and calligraphy, and chess. In female students, music and dancing (38.1 %) accounted for the highest participation, followed by tutoring class, others, sports exercises, drawing and calligraphy, and chess. The order of choices for hobby classes was similar in each age groups; however, the proportion varied (figure 2-2-1-2, figure 2-2-1-3, table 3-2-2-13, table 3-2-2-14).



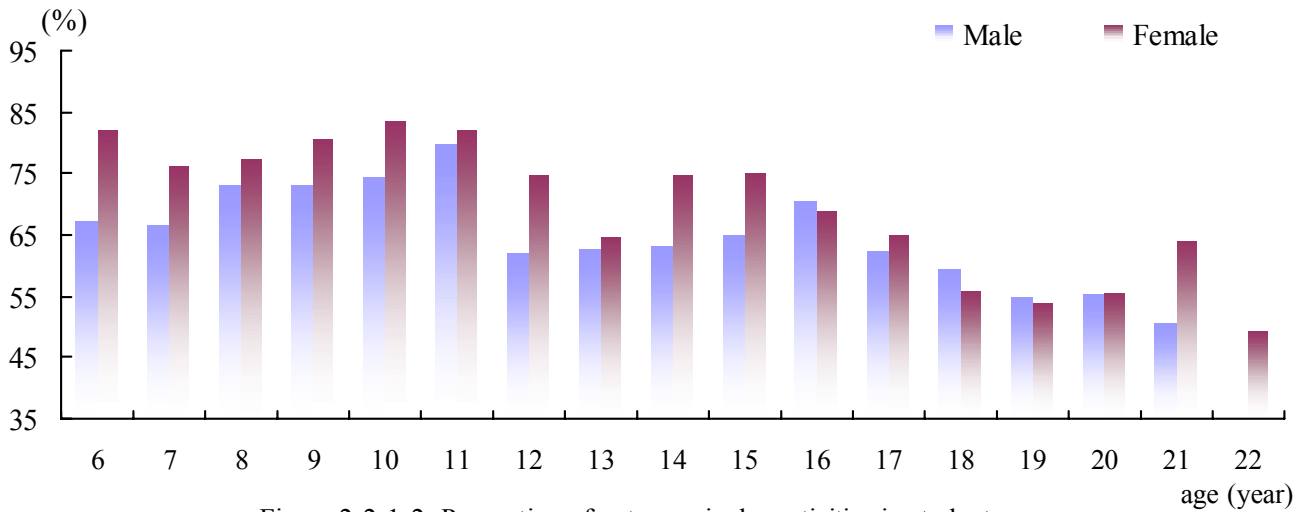


Figure 2-2-1-2 Proportion of extracurricular activities in students

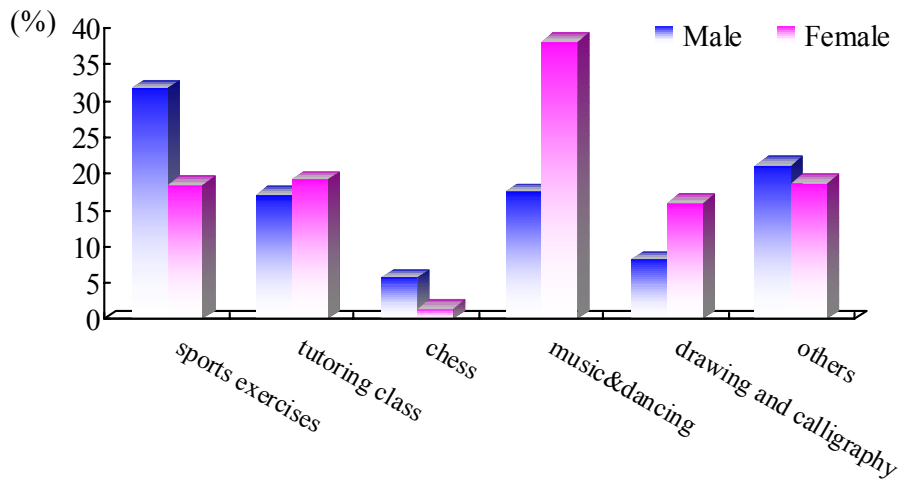


Figure2-2-1-3 Proportion of students participating in hobby classes

**2.1.2.2. Physical education at school**

The weekly frequency of attending physical education (PE) classes and exercise intensity of PE class were examined.

The percentage of aged 6~12 students who had two, one, three, four or more PE classes weekly accounted for 50.5 %, 47.9 %, 0.7 % and 0.4 %, respectively. The percentage of aged 13~18 students who had two, one and four or more PE classes weekly accounted for 31.5 %, 66% and 0.1 %, respectively. It is worth noting that most of the students at age18 did not attend PE classes and this phenomenon increased with age. In the 19 to 22 year age group, 59.5 %, 30.4 % and 9.4 % of the students had no, one and two PE classes, respectively; no students had four or more PE classes per week. In the 6~18 year age group, there was no significant difference in the percentage of male and female students attending PE classes. In the 19~22 year age group, significant difference was found between male and female students ( $P < 0.05$ ); the percentage of female students attending PE class once and twice per week was higher than the male

students, whereas the percentage of not attending PE class was lower than male students. In regards to the number of times attending PE classes, it was shown that the percentage of primary school students attending one PE classes with one session each time (59.9 %) was higher than that of secondary school students (45.8 %) (since more primary school students attended PE classes twice; therefore, the proportion of one session each time was higher). The percentage of primary school students attending PE classes with two sessions each time (39.4 %) was lower than that of secondary school students (54.0%)(since most secondary school students attended only one PE class per week; therefore, each PE class was having two consecutive sessions). Since PE class was commonly a non-compulsory course, majority of university students did not attend PE classes, and those who took PE class as their selective course only attended one PE class with one session per week (figure 2-2-1-4, figure 2-2-1-5, table 3-2-2-15, table 3-2-2-16, table 3-2-2-17, and table 3-2-2-18).

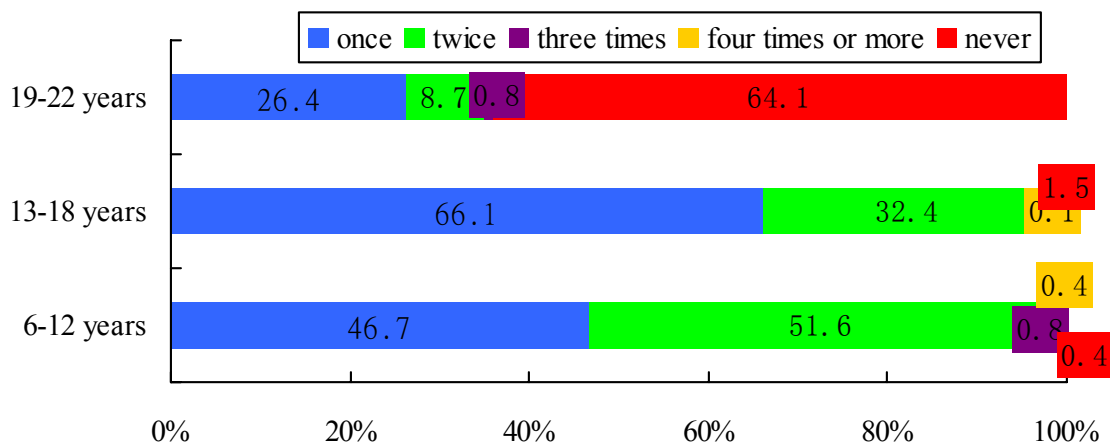


Figure 2-2-1-4 Proportion of male students attending PE classes weekly

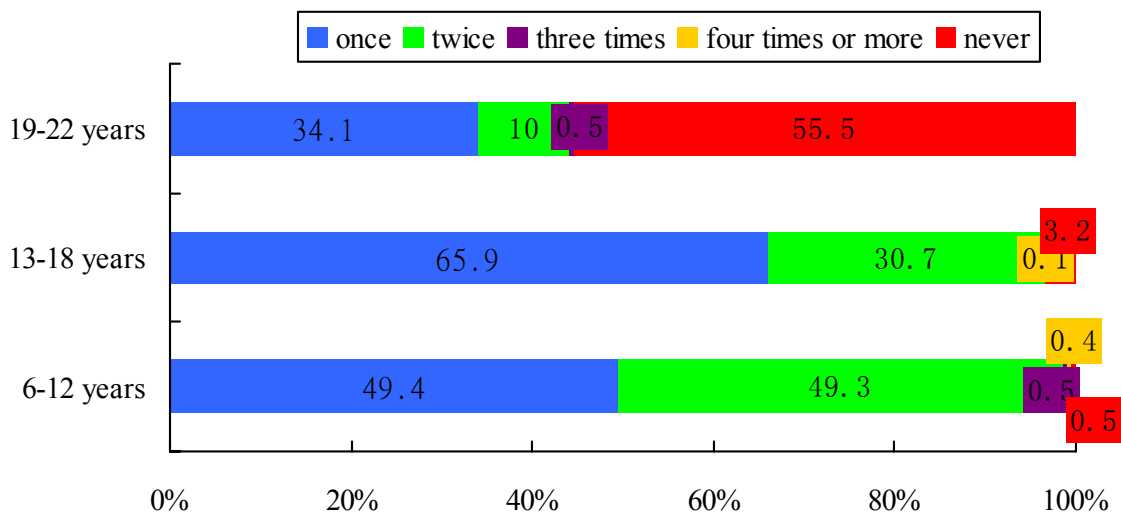


Figure 2-2-1-5 Proportion of female students attending PE classes weekly

Students who were able to reach moderate, light and high exercise intensity during PE classes were 63.1 %, 22 % and 14.9 %, respectively. The proportion of students reaching moderate and high exercise intensity increased and students maintaining low exercise intensity decreased as age increased, and there was a significant increase in female reaching moderate exercise intensity. However, male students had a higher percentage of people reaching high exercise intensity. There was a significant difference among genders in exercise intensity ( $P < 0.01$ )(figure 2-2-1-6, figure 2-2-1-7, table 3-2-2-19, table 3-2-2-20).

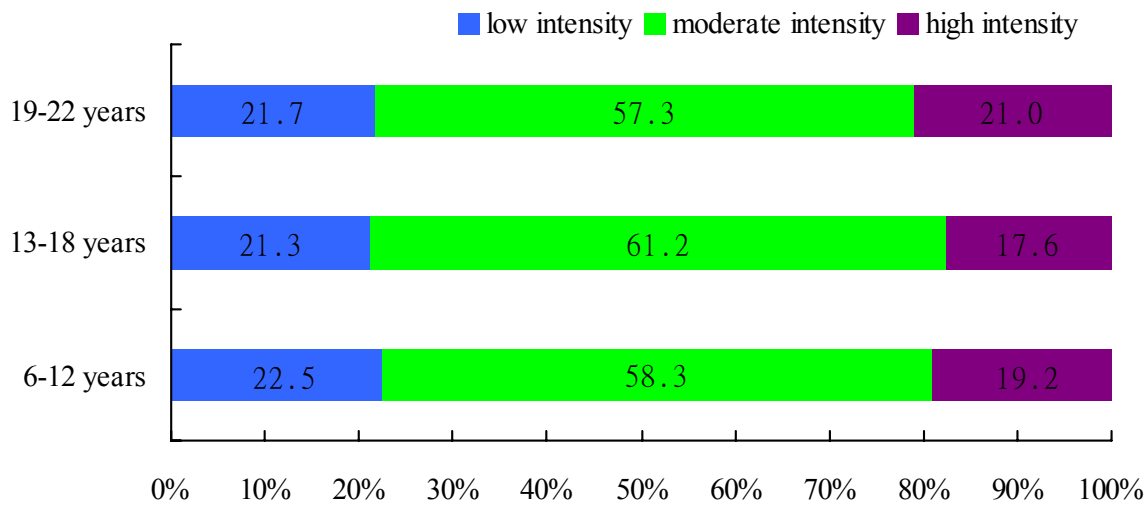


Figure 2-2-1-6 Exercise intensity of male students during PE classes

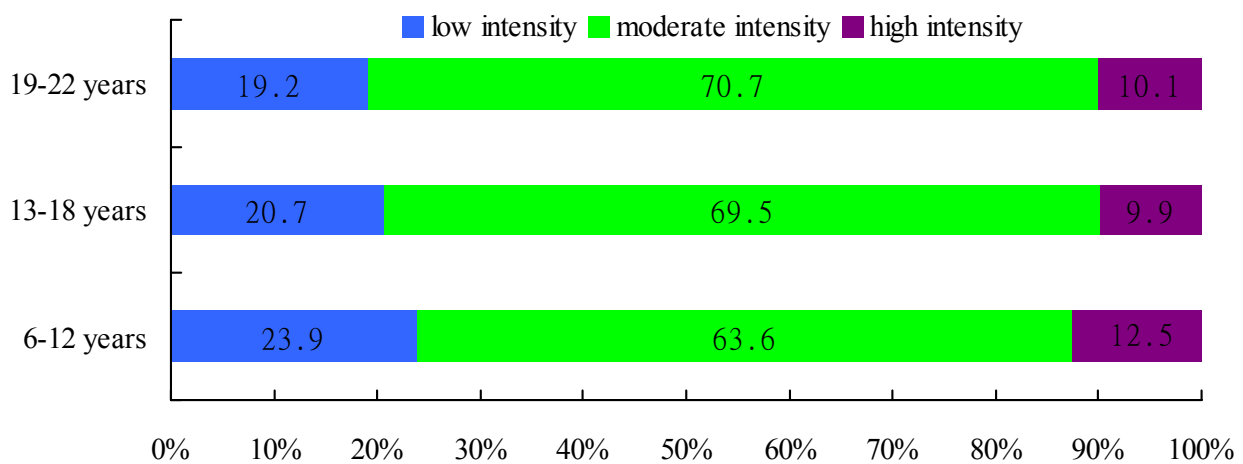


Figure 2-2-1-7 Exercise intensity of female students during PE classes

### 2.1.2.3. Extracurricular physical exercise

Four aspects on students' extracurricular physical exercise were examined. These included frequency of doing physical exercise, duration of exercise, intensity of exercise and types of exercise.

Results showed that subjects never participated in extracurricular physical exercise accounted for the highest proportion (35.3 %), followed by those who participated in extracurricular physical exercise once to twice a week (33.1 %), then by those who participated less than once (18.5 %), 3~4 times (9.3 %), 5

times or more (3.8 %) in a week.

The order of results was basically the same between both sexes and among the three age groups. The proportion of students who never participate in extracurricular physical exercise increased with age, and the proportion of students who participated 3~4 times a week declined with age. Among students at age 6~22, the proportion of female students that never participated in extracurricular physical exercise (40.9 %) was higher than that of male students (30 %). There was significant difference in genders; between university, secondary and primary school students. Whereas, no significant difference was seen between secondary and primary school students (figure 2-2-1-8, table 3-2-2-21, and table 3-2-2-22).

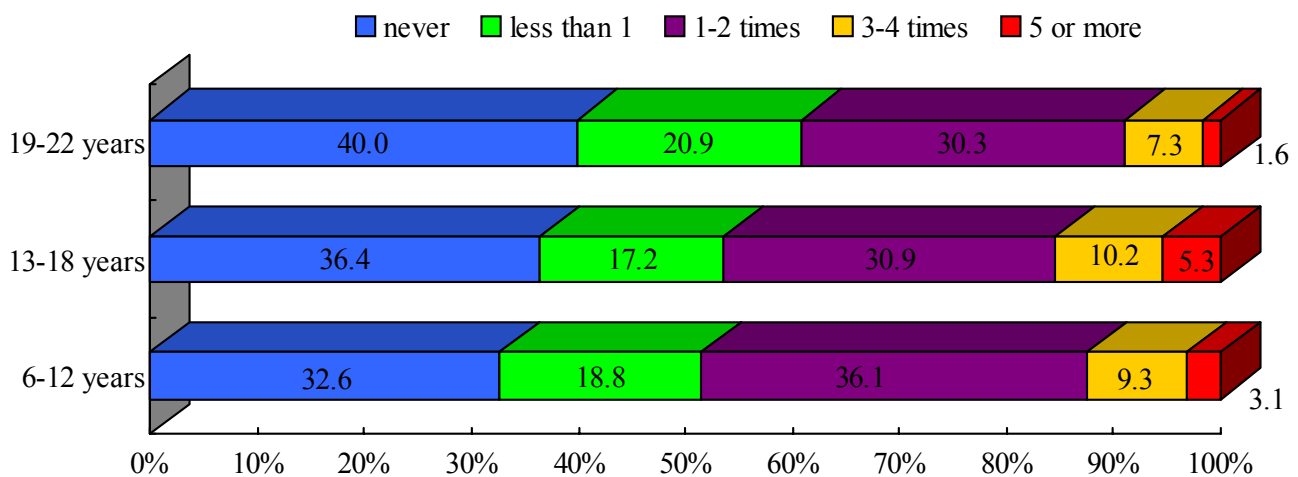


Figure 2-2-1-8 Proportion of students participating in extracurricular exercises weekly

Among students who participated in physical exercise, students who exercised for 30 minutes to 1 hour accounted for the highest proportion (40.8 %) followed by 1 to 2 hours (29.5 %), less than 30 minutes (19.5 %) and 2 hours or more (10.1 %). This pattern of exercise duration was the same for male and female students. The pattern of exercise duration of the three age groups was basically the same as above (table 3-2-2-23, table 3-2-2-24).

Most of the students (59.5 %) reached moderate exercise intensity and the proportion of male students doing high intensity exercise (31.4 %) was higher than that of female students (19.8 %). In all three age groups, students doing exercises with moderate intensity accounted for the highest proportion. In the 6~12 year age group, the proportion of students exercising at low intensity was the same with that of those at high intensity. From aged 13 onwards, students doing moderate intensity exercise accounted for the second highest proportion whereas low intensity accounted for the least proportion. Significant differences were seen between genders and among age groups ( $P < 0.01$ ) (figure 2-2-1-9, table 3-2-2-25 and table 3-2-2-26).

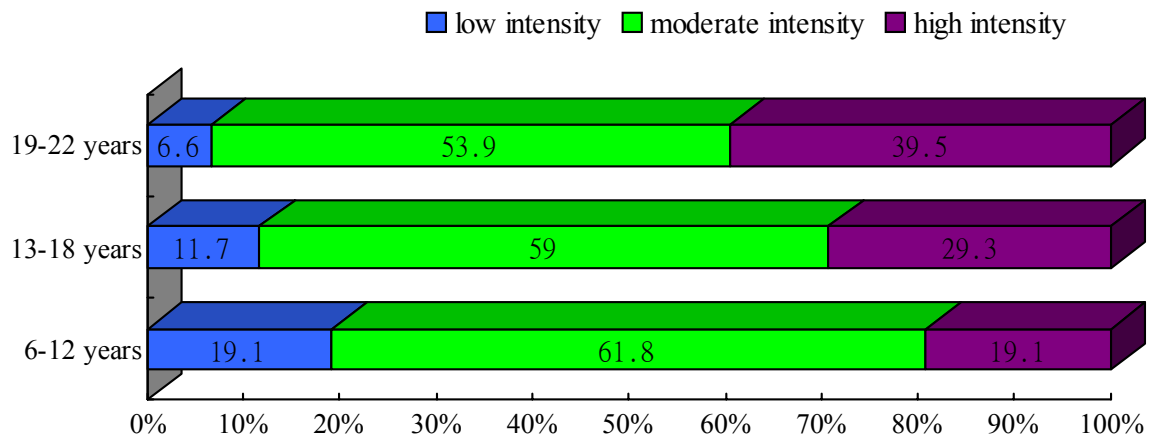


Figure 2-2-1-9 Extracurricular exercise intensity of students

People who exercised 3 times or more per week, each time for longer than 30 minutes with moderate exercise intensity were defined as “Frequent exerciser”. For those who exercised but could not achieve all three criteria mentioned above at the same time were defined as “occasional exerciser”. Those who did not meet any of the criteria were defined as “non-exerciser”. Physical exercise for students included both PE class and extracurricular physical exercise.

Among students, 37.5% were frequent exercisers, 56.1% were occasional exercisers and 6.5% were non-exercisers. The proportion of frequent exercisers was higher in male (42.0%) than female students (32.8%), and the proportion of non-exercisers were lower in male (5.2%) than female students (7.8%). Frequent exercisers accounted for the highest proportion in the 6~12 and 13~18 year age groups (41.5 % and 41.4% respectively), and the lowest in the 19~22 year age group (15.8%). Non-exercisers accounted for the highest proportion in the 19~22 year age group (36.9%). Significant differences among age and genders were observed ( $P < 0.01$ )(figure 2-2-1-10 and figure 2-2-1-11).

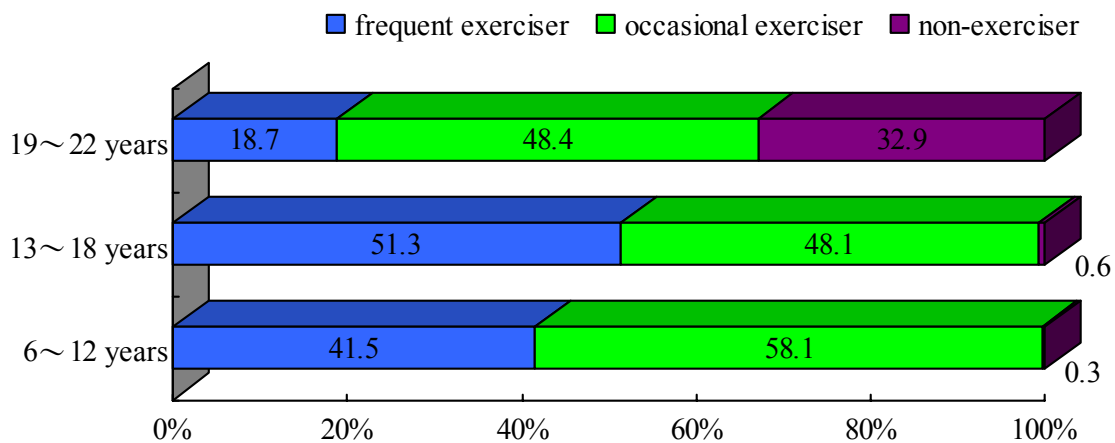


Figure 2-2-1-10 Proportion of frequent, occasional and non-exercisers in male students

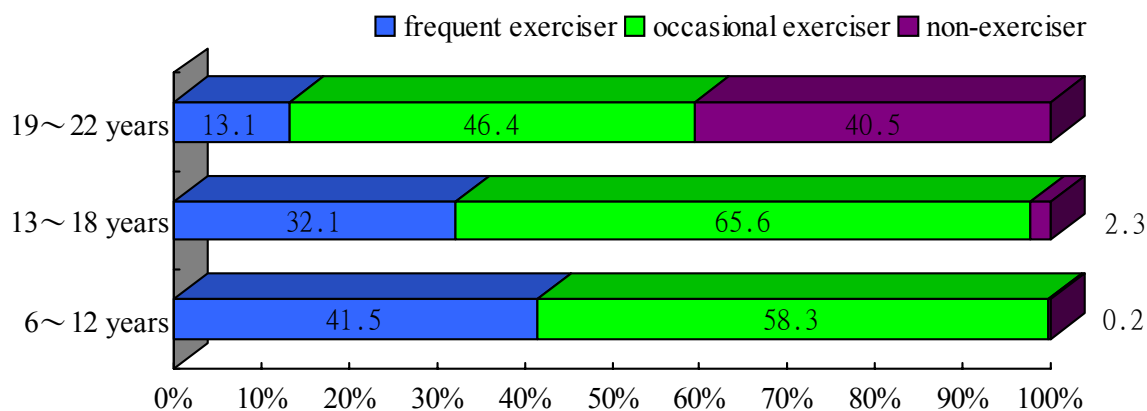


Figure 2-2-1-11 Proportion of frequent, occasional and non-exercisers in female students

Among all the extracurricular physical exercise, the main type of sports that the subjects participated in most were ball games (53.8 %), swimming (26.5%), track and field(25.8 %), biking (17.9%), others (15.4 %)and rope skipping (10.6 %). The order of the type of sports participated in mostly for male students was similar, and the order for female was ball games, track and field, swimming, dancing, biking, rope skipping and others. Sports with the highest proportion of participation was ball games in all three age groups, from 6~12 years old onwards, the subsequent highest proportion of participation was swimming, biking, track and field, rope skipping and others. For the 13~18 year age group, sports they participated the most were successively track field, followed by swimming, others, bicycling and dancing. For the 19~22 year age group, the first three sports with the highest proportion of participation were the same as the 13~18 year age group, followed by biking and dancing(table 3-2-2-27,table 3-2-2-28).

The highest proportion of participation of ball games was basketball (31.5 %), followed by badminton (26.7 %), table tennis (13.9%), football (10.5%) and volleyball (7.4 %). Participation in other types of ball game was low. Basketball accounted for the highest proportion of participation (39.1 %), followed by badminton (17.4 %), table tennis (16 %) and football (15.2 %) in male students; while badminton (45.3 %), basketball (16.4 %) and volleyball (14.4 %) were more popular among the female students. Students aged 6~12 participated most in badminton and were followed by basketball and table tennis. Students aged 13 or older participated most in basketball, followed by badminton (table 3-2-2-29, table 3-2-2-30).

**2.1.2.4. Occurrence of diseases**

Among students, 12.8 % had been diagnosed by the hospital to have certain diseases in the past 5 years. The occurrence of disease among males and females were 13.4 % and 12.1%, respectively with no significant difference between genders (figure 2-2-1-12, table 3-2-2-31, and table 3-2-2-32).

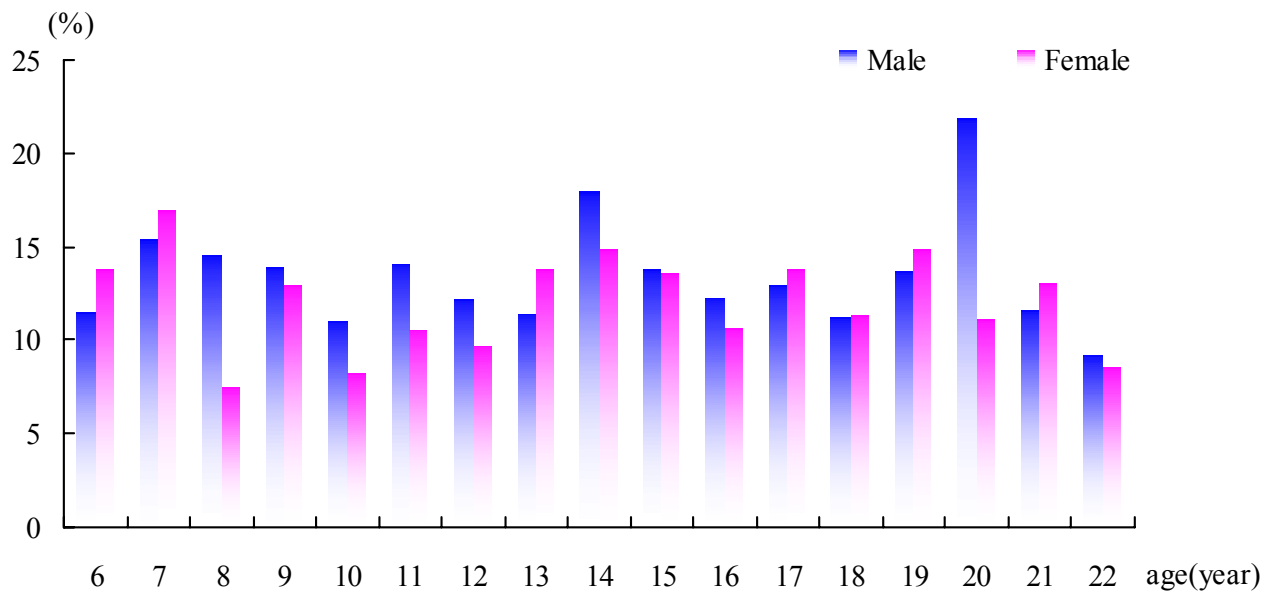


Figure 2-2-1-12 Occurrence of diseases in the past 5 years in students

The top five diseases occurring among these subjects were others (42.3 %), chronic bronchitis (18.2 %), accidental injury (14 %), asthma (12.2 %), pneumonia (11.3 %) and anemia (7.9 %). For male students, the top five most frequent diseases observed were others (42.7 %), chronic bronchitis(17.8 %), accidental injury (17.2 %), asthma (15.8 %), pneumonia (8.3 %) and anemia (4.3 %); whereas the top five most popular diseases observed in females were others (41.8 %), chronic bronchitis (18.6 %), pneumonia (14.7 %), anemia (12.1 %), accidental injury (10.5 %) and asthma (8.2 %). The top four mostly seen diseases occurring in students aged 6~12 in descending order were others, chronic bronchitis, pneumonia, asthma, accidental injury, anemia. Others, accidental injury, chronic bronchitis, asthma, anemia and pneumonia were the most commonly seen diseases in students aged 13~18 in descending order. For students aged 19~22, the descending order of the most occurring diseases were others, accidental injury, anemia, chronic bronchitis, hepatitis and asthma. It was worth noting that accidental injury accounted for the highest proportion in male students after age 10 (table 3-2-2-33, table 3-2-2-34).

### 2.1.3. Anthropometric Measurements

#### 2.1.3.1. Length indexes

Height of the subjects increased with age, stopped increasing after age 18 for males and after age 17 for females. Average height for male and female students ranged from 119.6~172.5 cm and 119.3~159.7 cm, respectively. No significant difference among genders in the height of the students in age groups 10, 11 and 13 year was found. After 13 years old, the average height of male students was significantly higher than female students in the same age group ( $P < 0.01$ ), and the difference ranged from 8.2~14.4 cm (table 3-2-3-1,figure 2-2-1-13).

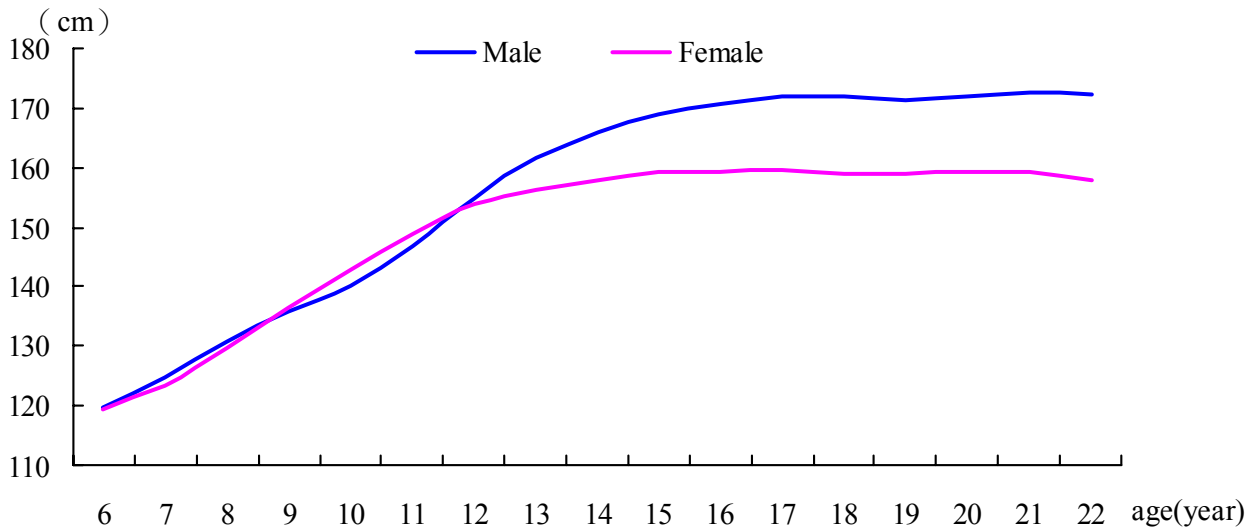


Figure 2-2-1-13 Average height of students

Sitting height of the students increased with age, and stopped increasing after age 17 for males and after age 15 for females. The average height for male and female students ranged from 65.6~92.2 cm and 65.2~86.0 cm, respectively. No significant difference in sitting height was seen between male and female students in age groups 6, 9 and 12 year. Since then, except the age groups of 10 and 11 year, average height of male students in other age groups was significantly higher than female students in the same age group ( $P < 0.01$ ), with difference ranged from 1.0~6.9 cm (table 3-2-3-2, figure 2-2-1-14).

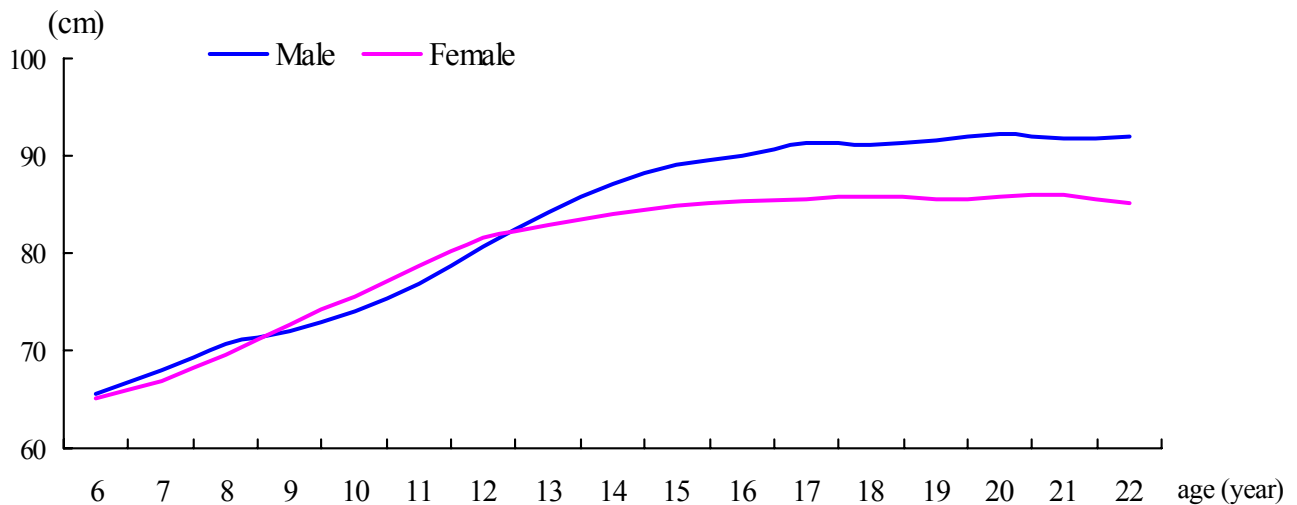


Figure 2-2-1-14 Average sitting height of students

Foot length increased with age until age 14 for male and age 12 for female students. The foot length reached 25.5 cm and 22.9 cm for male students at age 18 and for female students aged 15, respectively. The average foot length of male and female students ranged from 18.7~25.5 cm and 18.2~22.9 cm, respectively. No significant difference in foot length of male and female students at age 6~11 was seen except the age group of 10 years old. There was no significant difference in foot length of male and female students in other age groups, with the difference ranged from 0.3~2.8 cm (table 3-2-3-3, figure 2-2-1-15).



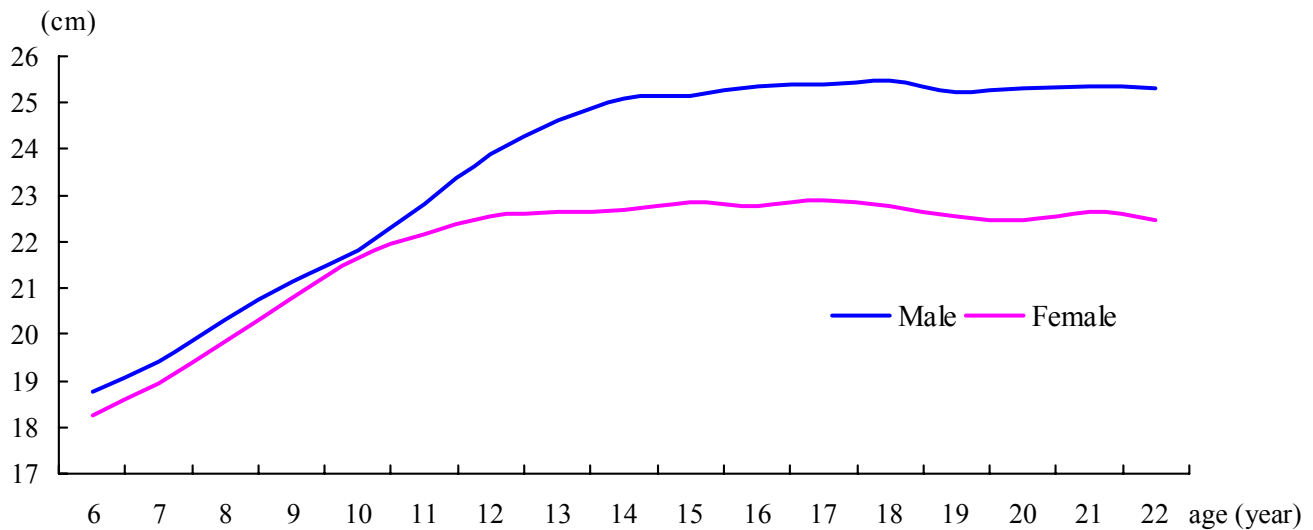


Figure 2-2-1-15 Average foot length of students

2.1.3.2. Weight and BMI

Weight of both male and female students increased with age, and the increase was larger before aged 18 for males and before aged 13 for females. After age 15, the weight of female students remained stable. The average weight of male and female students ranged from 22.9~66.3 kg and 22.0~52.6 kg, respectively. No significant difference among genders in weight was seen at age 6~12, except at the age group of 8 years old. After age 12, average weight of males was significantly higher than females ( $P < 0.01$ ), with difference ranging from 3.3~16.1 kg ( table 3-2-3-4, figure 2-2-1-16).

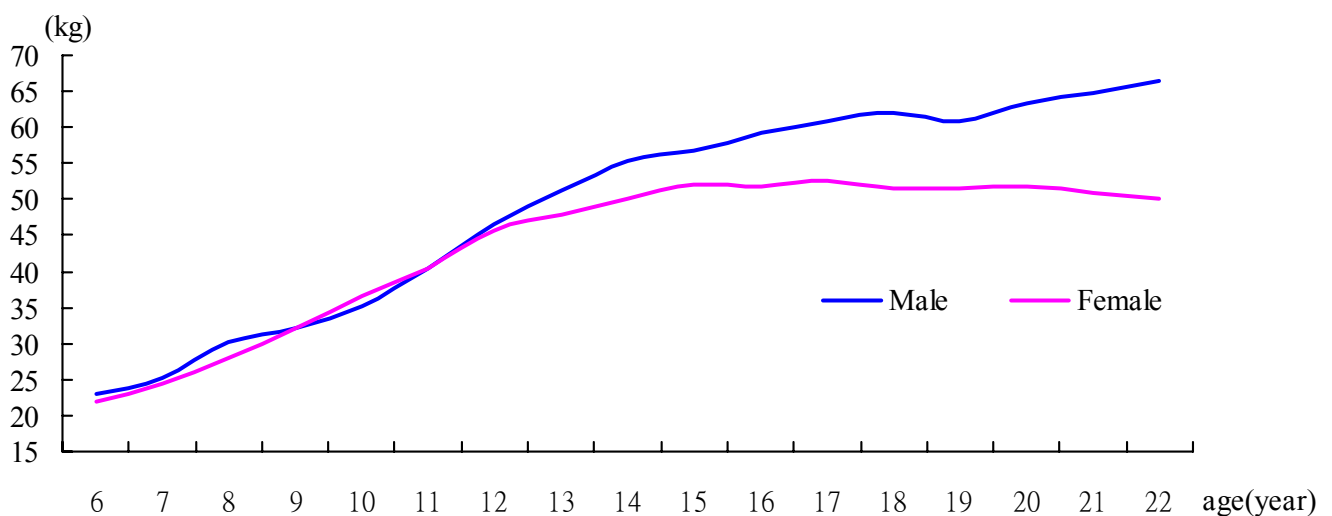


Figure 2-2-1-16 Average weight of students

BMI of male students increased with age between aged 6 and 22, whereas BMI for female students increased with age between aged 6 and 17 and then decreased slightly afterwards. The average BMI of male and female students ranged from 15.9~22.3 and 15.3~20.6, respectively. Between aged 6~12 and between aged 18~22, the average BMI of male students was significantly higher than that of the female students ( $P < 0.05$ ), with a difference ranging from 0.1~2.2. Except in the age groups of 8, 15 and 20~22

year old, no significant difference among genders was seen in BMI in other age groups. According to the weight and height evaluation standard for children and adolescents (students) in “Physical Fitness Standards for the Chinese Citizens”, the percentage of male students at age 7 and 13~16 who were overweight and obese was lower than that of female students. In other age groups, the percentage of students who were overweight or obese was higher in male than female in the same age group (table 3-2-3-5, table 3-2-3-6, figure 2-2-1-17, figure 2-2-1-18).

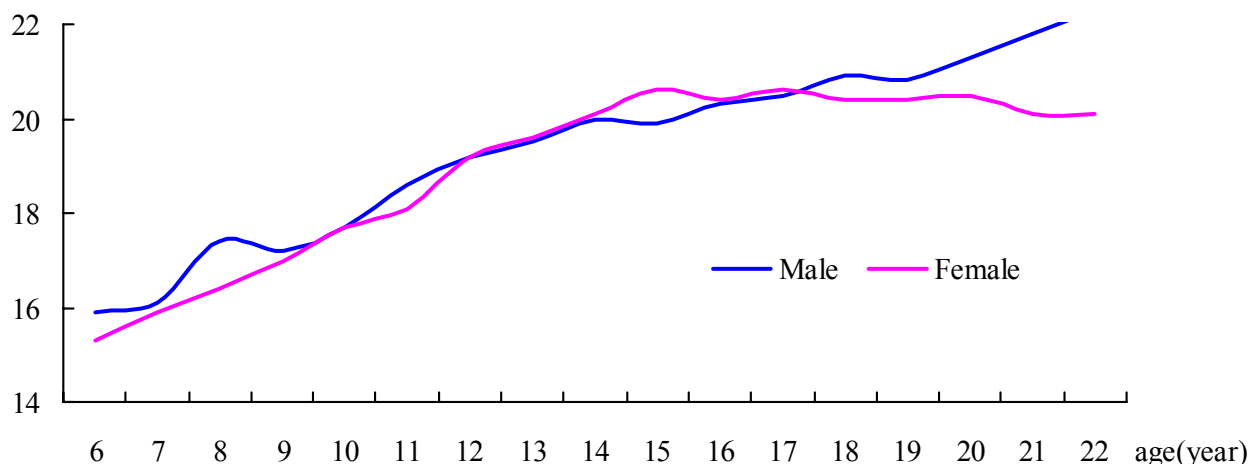


Figure 2-2-1-17 Average BMI of students

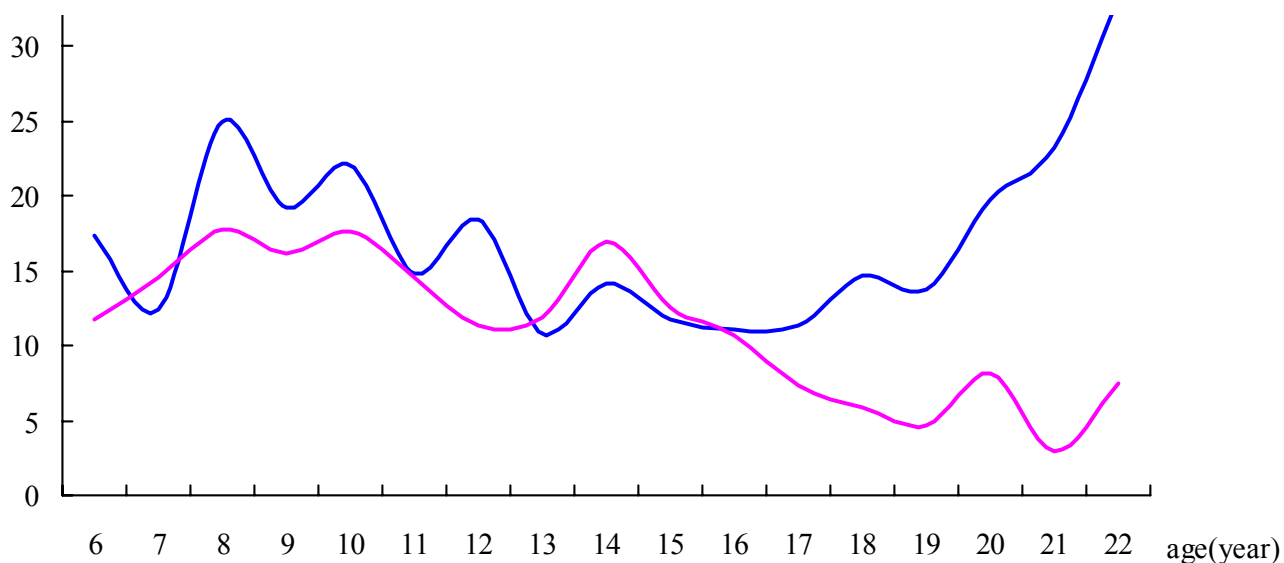


Figure 2-2-1-18 Proportion of overweight in students

**2.1.3.3. Circumference indexes**

Chest, waist and hip circumferences for male students increased with age, while those for female students increased with age until aged 17 and circumferences fluctuated slightly based on the average values thereafter. The average chest, waist and hip circumferences of male and female students ranged from 58.4~89.6 cm (male) and 56.2~80.6 cm (female), 54.3~80 cm (male) and 52.4~70.2 cm (female) and 61.2~92.8 cm (male) and 61.5~90 cm (female), respectively (table 3-2-3-7, table 3-2-3-8, table 3-2-3-9).

The chest circumference of males was higher than that of females except in the age group of 10, and the difference ranged from 0.1~9.8 cm. No significant difference among genders was observed in the age of 9~12; however, the significant difference among genders was found in other age groups ( $P < 0.05$ ). Waist circumference of male students was significantly higher than that of female aged between 6~22 (except in the 6, 10, 14 and 15 age groups), with difference ranged from 1.5~10.1 cm and the difference was significant ( $P < 0.05$ ). The difference in hip circumference between male and female students was not as obvious as that of the chest and waist circumference. In the age groups of 10~15, hip circumference of females was higher than that of male, but the significant difference was only seen in the age groups of 12 and 15 ( $P < 0.05$ ). The hip circumference of males was significantly higher than females after age 16, and the significant difference was only found in the age groups of 21 and 22 ( $P < 0.05$ ) (figure 2-2-1-19, figure 2-2-1-20, figure 2-2-1-21).

The waist-to-hip ratio (WHR) of male and female students declined as age increased between the age of 6~18, and slightly increased thereafter for males. The average WHR of male and female students ranged from 0.811~0.888 and 0.777~0.853, respectively. The WHR of males was significantly higher than females ( $P < 0.01$ ), with difference ranged from 0.025~0.072 (table 3-2-3-10, figure 2-2-1-22).

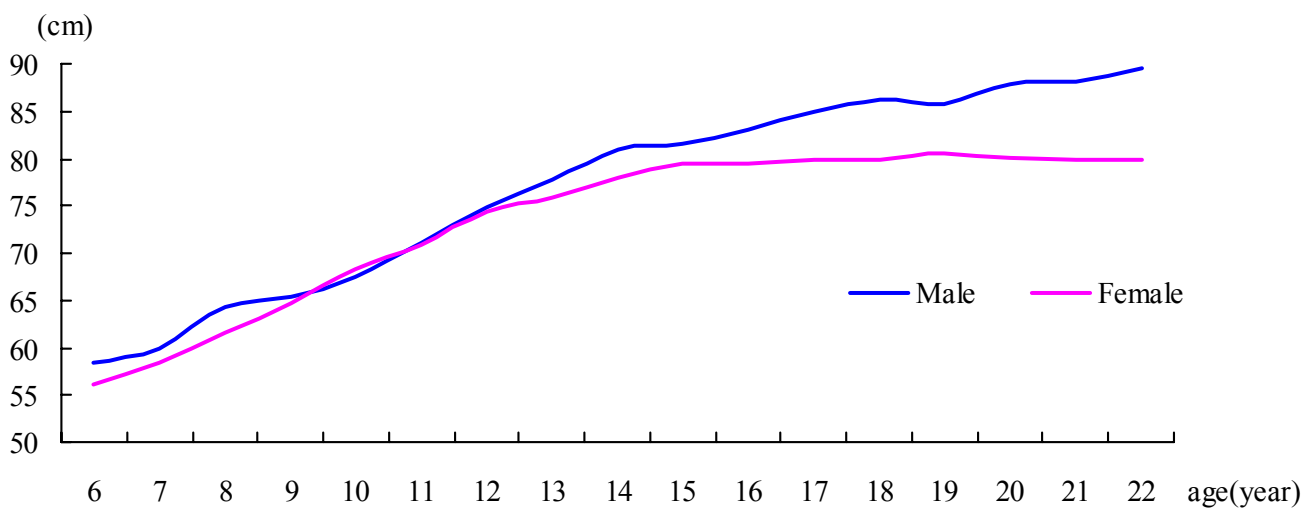


Figure2-2-1-19 Average chest circumference of students

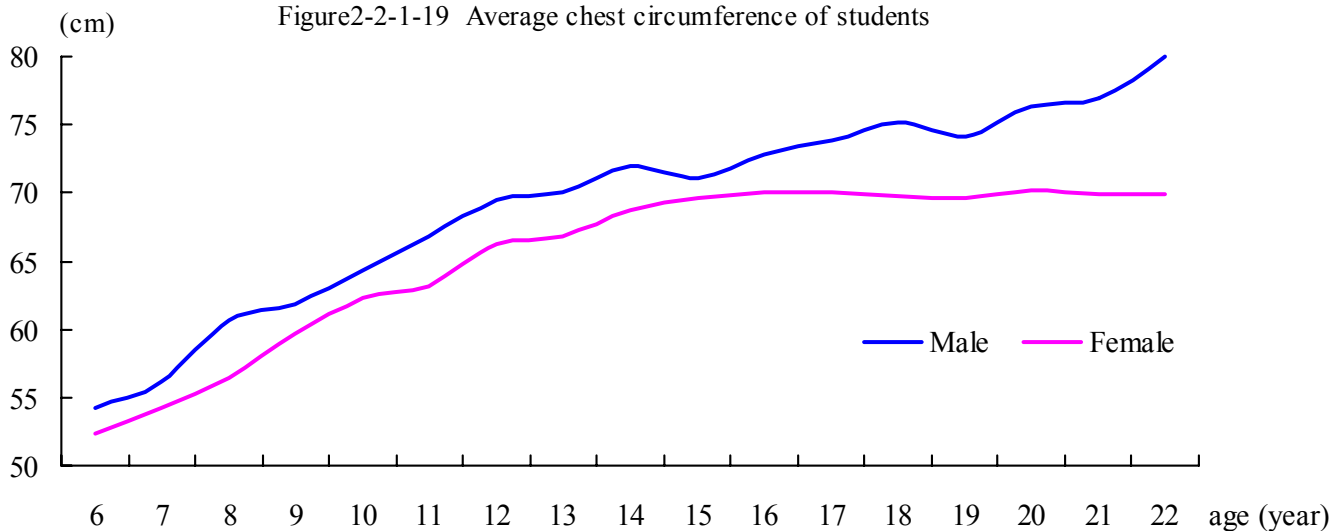


Figure 2-2-1-20 Average waist circumference of students

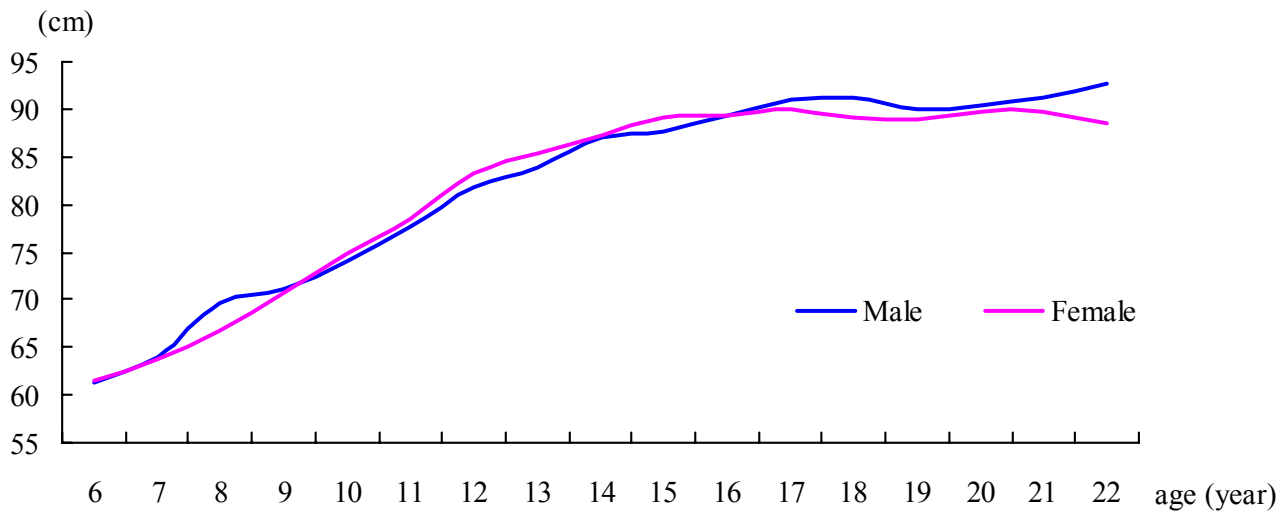


Figure 2-2-1-21 Average hip circumference of students

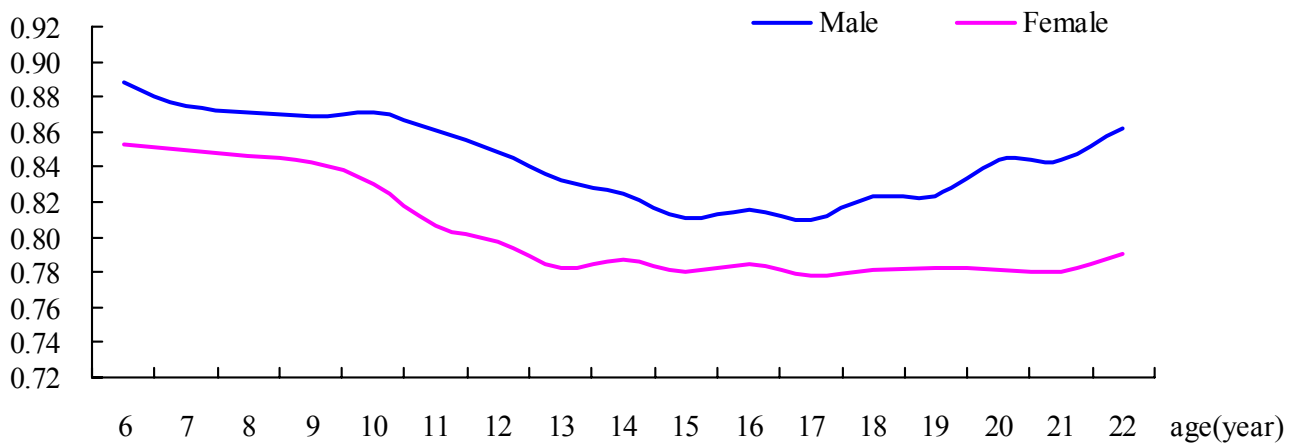


Figure 2-2-1-22 Average WHR of students

**2.1.3.4. Width indexes**

Shoulder width increased with age and the rate of increase was fairly large between the age of 6~14 for males and 6~12 for females, and the increase slightly slowed down thereafter. The average shoulder width of male and female students ranged from 25.7~38.8 cm and 25.7~34.8 cm, respectively. Shoulder width of males was higher than that of females after age 13. Before age 12, the increase of shoulder width in both males and females was similar. After age 12, the increase in shoulder width in females was slower than male students and the difference between males and females increased ( $P < 0.01$ ). Except in the age groups of 8 and 12, the significant difference in shoulder width between males and females was seen in other age groups (table 3-2-3-11, figure 2-2-1-23).

Pelvis width increased with age and the rate of increase was greater before age 15 and slowed down thereafter. The average pelvis width for males and females ranged from 18.5~26.7 cm and 18.7~26.5 cm, respectively. No significant difference among genders was seen in pelvis width between the age of 6~13. Between the age of 18~22, the average pelvis width of males was 0.1~0.5 cm higher than that of females, with a significant difference among genders. Except at the age group of 18, the significant difference among genders was seen in other age groups ( $P < 0.05$ ) (table 3-2-3-12, figure 2-2-1-24).

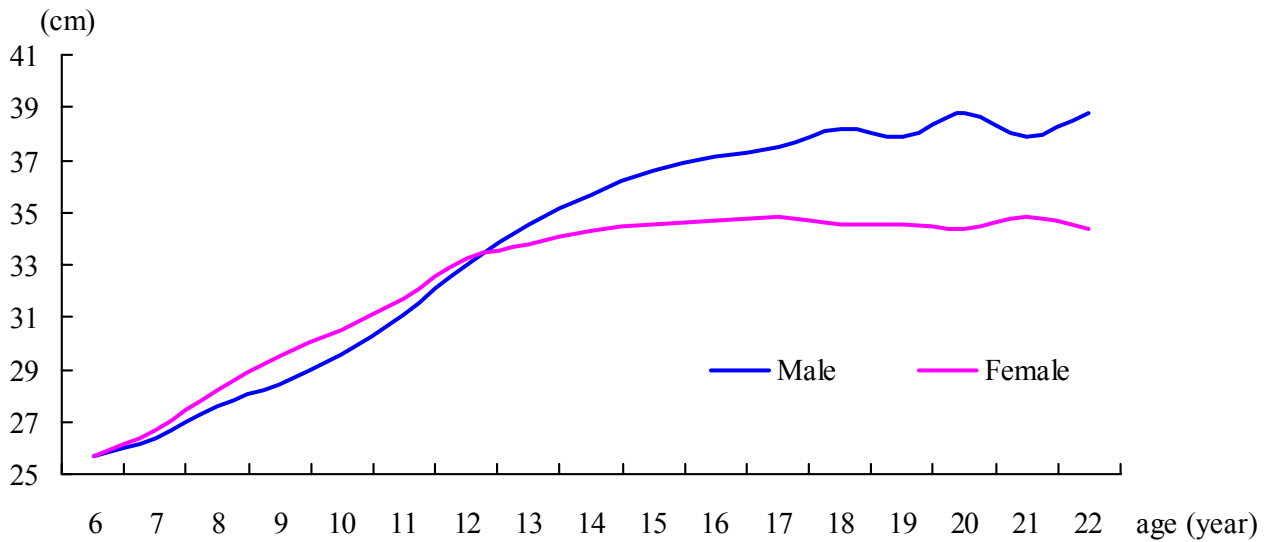


Figure 2-2-1-23 Average shoulder width of students

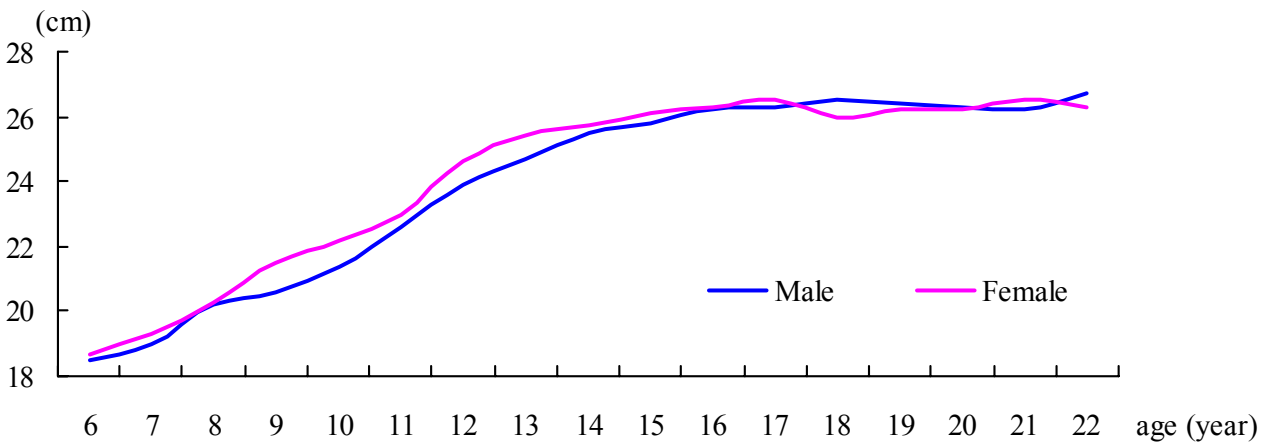


Figure 2-2-1-24 Average pelvis width of students

**2.1.3.5. Body composition**

The upper arm, subscapular and abdominal skinfold thickness increased with age for the male students between the age of 6~12 and female students between 6~15 years, thereafter remained stable for males and decreased slightly for females. The average skinfold thickness of the upper arm, subscapular and abdominal for males and females ranged from 8.1~13.2 mm (male) and 10.1~20.8 mm (female), 4.7~14.5 mm (male) and 5.9~15.5 mm (female) and 6.5~18.3 mm (male) and 8.6~22.5 mm (female), respectively (table 3-2-3-13, table 3-2-3-14, table 3-2-3-15).

No significant difference among genders in skinfold thickness of the three sites was seen at the age of 8, 11 and 22, and skinfold thickness of the three sites was higher in females than males in all other age groups. The difference in upper arm skinfold, subscapular skinfold and abdominal skinfold between females and males ranged from 2~12.6 mm, 0.8~6.2 mm and 1.1~11.4 mm, respectively with significant difference ( $P < 0.05$ ) (figure 2-2-1-25, figure 2-2-1-26, figure 2-2-1-27).

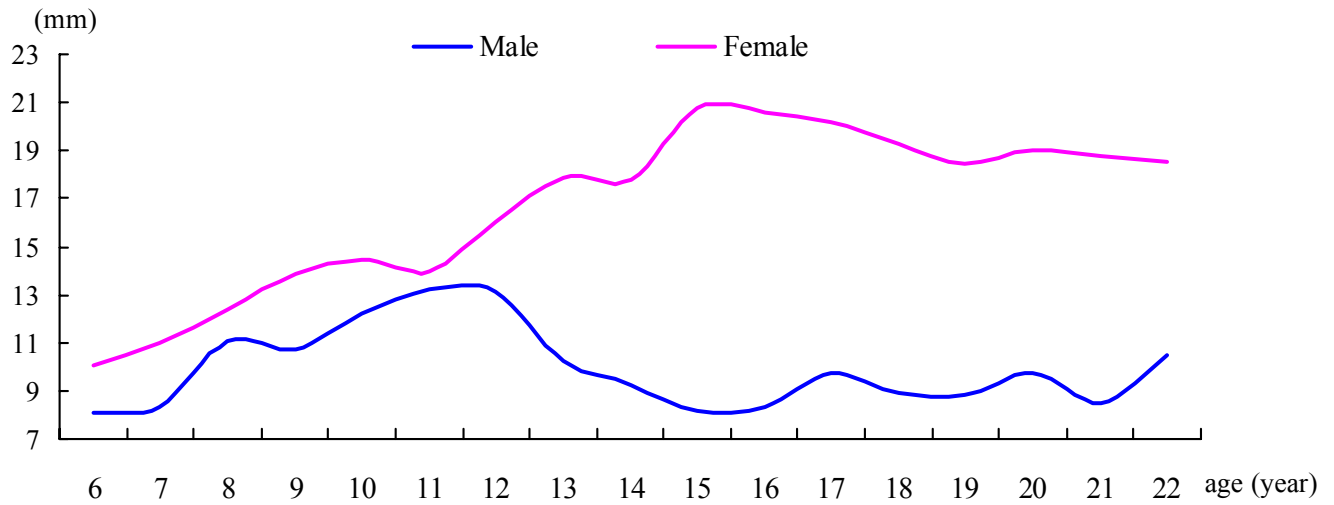


Figure 2-2-1-25 Average upper arm skinfold thickness of students

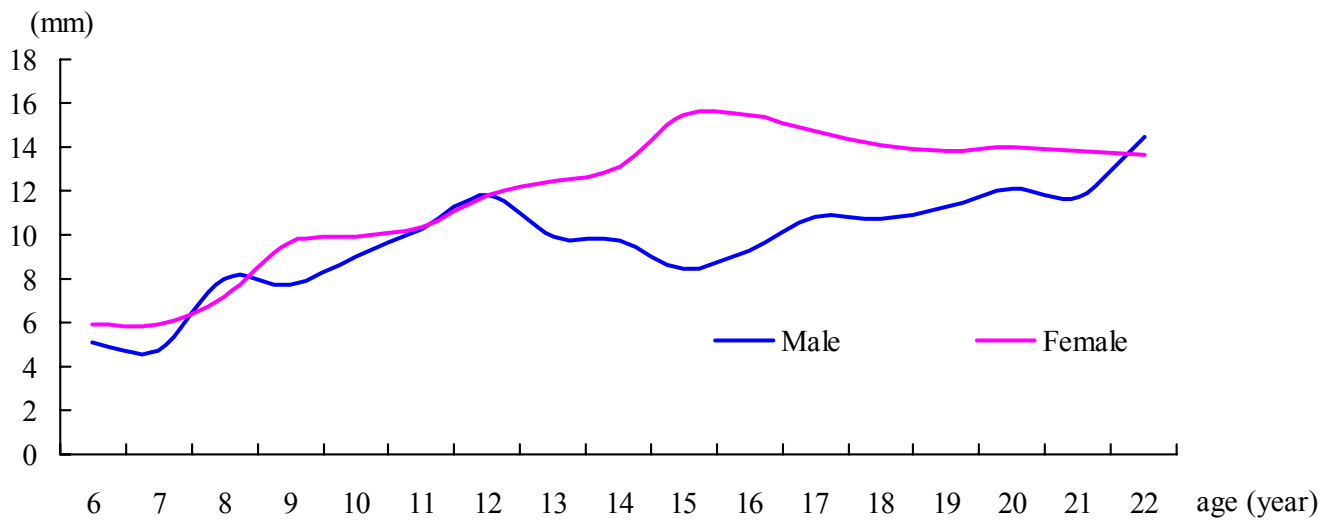


Figure 2-2-1-26 Average subscapular skinfold thickness of students

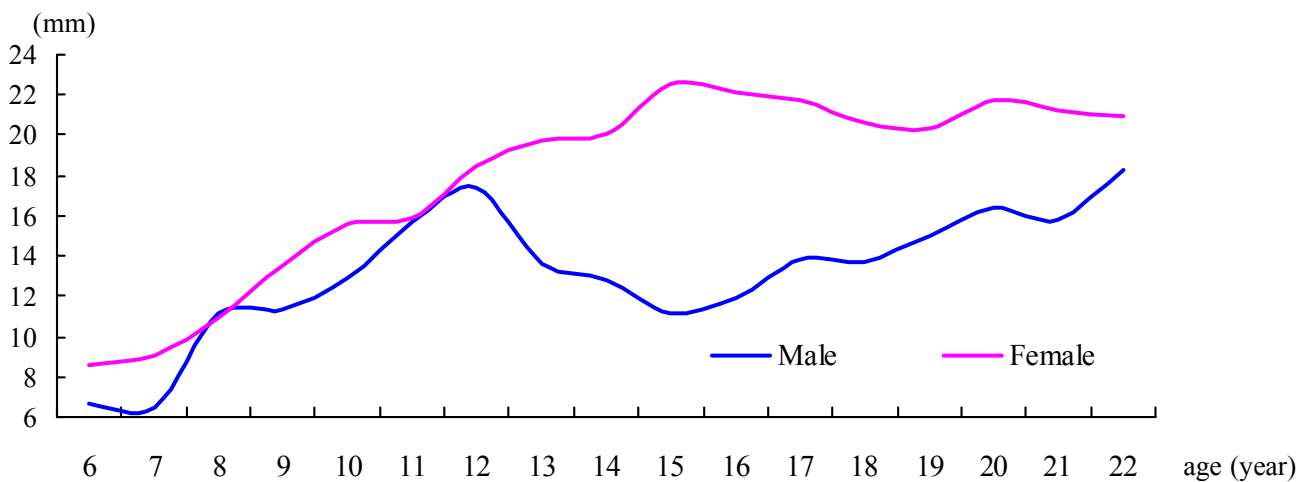


Figure 2-2-1-27 Average abdominal skinfold thickness of students

Body fat percentage and lean body mass of  $\geq 9$  years old students were predicted by using skinfold thickness measurement and the Japanese Brozek formula. Body fat percentage reflected the proportion of body fat to weight and lean body mass referred to the amount of water, minerals and organic materials. Body fat percentage and lean body mass were often used to assess body composition.

Body fat percentage of male students increased with age between 9~11 years old and decreased thereafter. Body fat percentage ranged from 11.8%~19.5% between age 12~22. Body fat percentage of female students increased with age before age 15 and remained stable at about 22 % after age 19. Body fat percentage of males and females ranged from 11.8%~20.3% and 22.3%~27.5%, respectively (table 3-2-3-16).

Percentage body fat of female students at age 9~22 was significantly higher than male ( $P < 0.05$ ), with a difference ranged from 3.0~15.7%. The biggest difference in percentage body fat between males and females was at the 15~18 age group (figure 2-2-1-28).

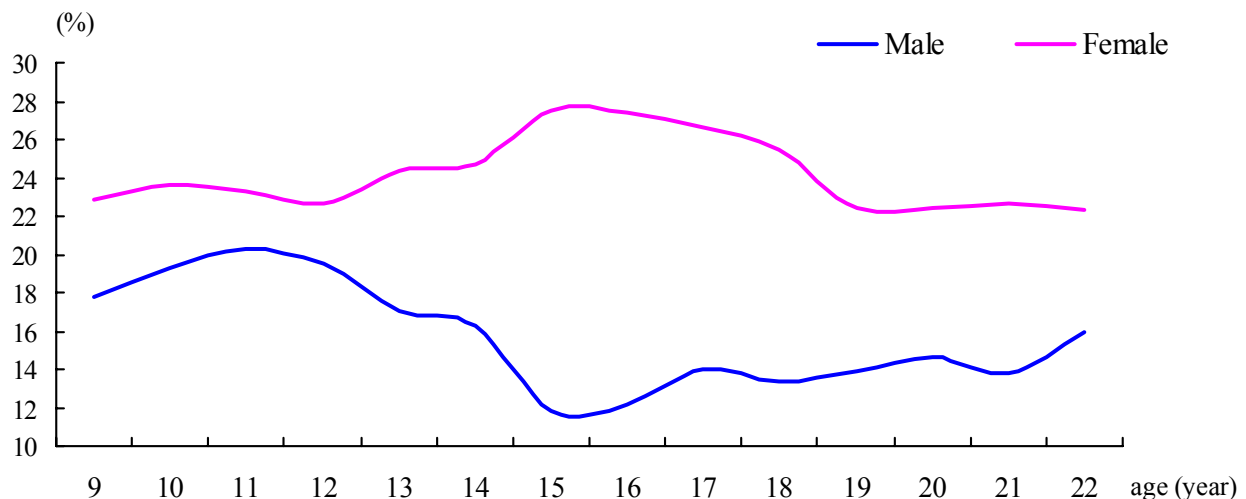


Figure 2-2-1-28 Average percentage body fat of students

The lean body mass increased with age in males and the rate of increase was greater before age 16 and then slowed down thereafter. The lean body mass also increased with age in females, and reached a peak at age 14 and then remained stable with little change thereafter. The average lean body mass of males and females ranged from 26.1~55.5 kg and 24.2~39.8 kg, respectively (table 3-2-3-17).

Lean body mass was significantly higher in males than females between age 9~22 ( $P < 0.05$ ), and the difference began to increase from age 12. The difference in lean body mass between males and females at age 9~14 and age 15~22 ranged from 0.6~8.6 kg and 12.4~16.8 kg, respectively (figure 2-2-1-29).

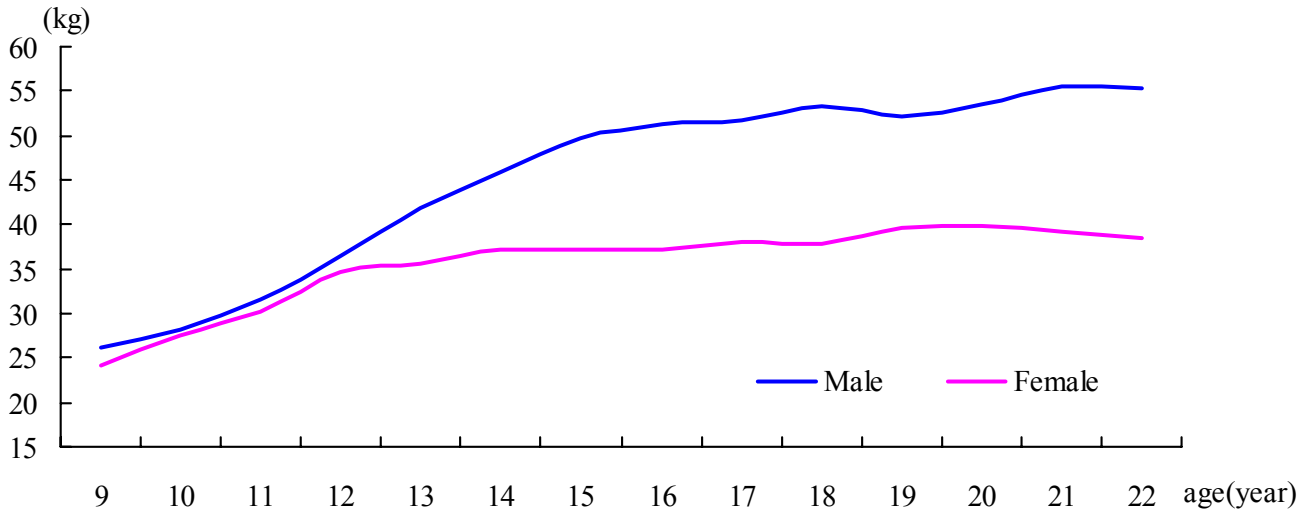


Figure 2-2-1-29 Average lean body mass of students

### 2.1.4. Physiological Function

The physiological function levels were reflected by resting pulse and blood pressure (systolic pressure and diastolic pressure) and vital capacity.

#### 2.1.4.1. Resting pulse

Resting pulse is a simple way to reflect the functions of the circulatory system. Resting pulse of male and female students at age 6~22 decreased as age increased. The decrease was more obvious for males after age 14 (except aged 17 and 18), whereas the decrease for females was obvious after age 15. Between ages 6~22, the decrease in resting pulse of male and female students were 13.5 times/minute and 11.8 times/minute, respectively. Resting pulse for males and females ranged from 88.3~74.8 times/minute and 87.9~76.1 times/minute, respectively. Females resting pulse was higher than males in most age groups (table 3-2-4-1, figure 2-2-1-30).

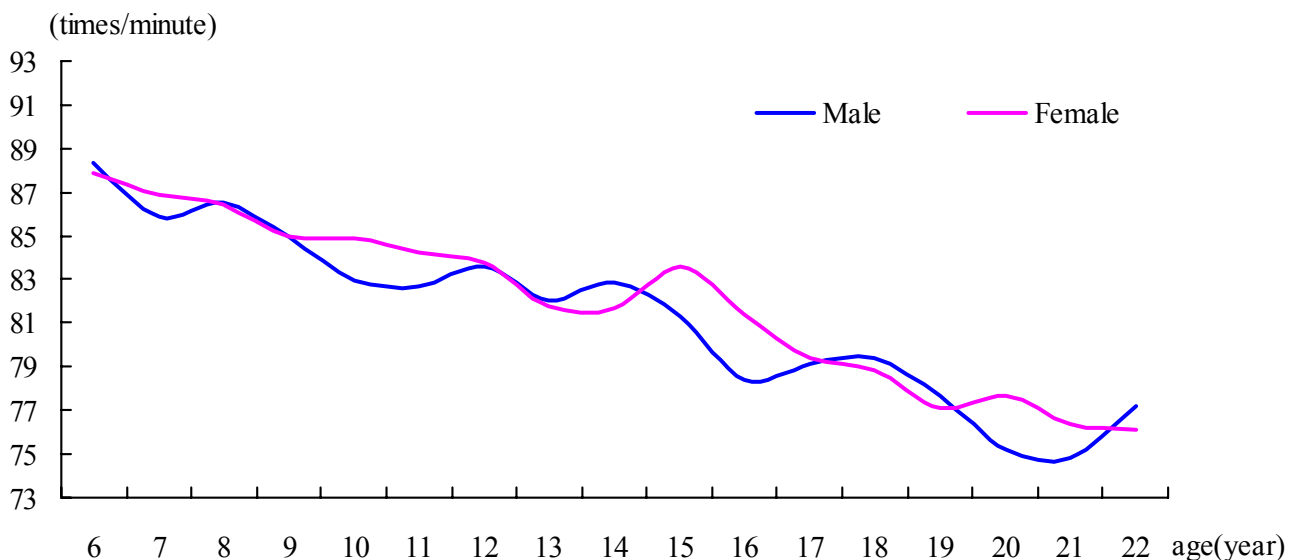


Figure 2-2-1-30 Average resting pulse of students



### 2.1.4.2. Blood pressure

When the ventricle contracts, the blood pressure of artery rises and the highest value is called systolic pressure, which reflects mainly the quantity of blood pumped out by each pulse. When the ventricle relaxes, the blood pressure of artery descends and the lowest value is called diastolic pressure, which reflects mainly the outside resistance. The difference between systolic and diastolic pressures is called pressure difference, which reflects the elasticity of the artery wall.

Systolic pressure of the students increased with age between 6~22 years old. The degree of increase was higher between 9~14 years old male students and 9~13 years old female students. After age 14 (male) and aged 13 (female), the rise in systolic pressure slowed down or remained relatively stable, ranging from 92.2~124.6 mmHg and 89.9~111.1 mmHg for males and females, respectively. After age 13, the systolic pressure of males was obviously higher than females ( $P < 0.01$ ), and the difference was more obvious after age 18 (table 3-2-4-2, figure 2-2-1-31).

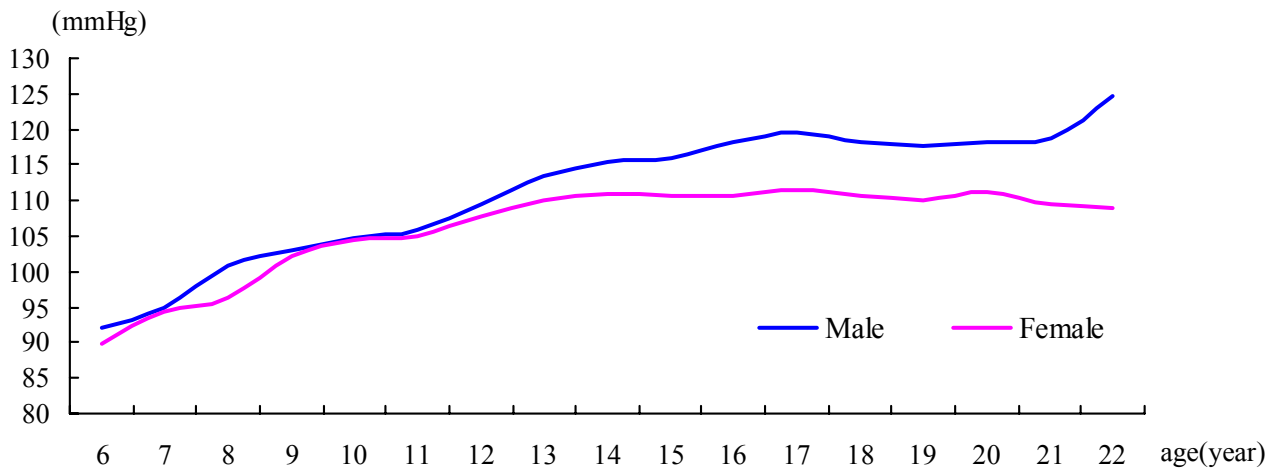


Figure 2-2-1-31 Average systolic pressure of students

Diastolic pressure of male and female students increased slowly as age increased between age 6~22, without significant difference in the rate of increase between age groups. The average diastolic pressure ranged from 57.4~78.4 mmHg for males and 57.3~70.9 mmHg for females. Diastolic pressure of males was obviously higher than females except at age 11 and 12, and the significant difference among genders was seen after age 15 ( $P < 0.01$ ) (table 3-2-4-3, figure 2-2-1-32).

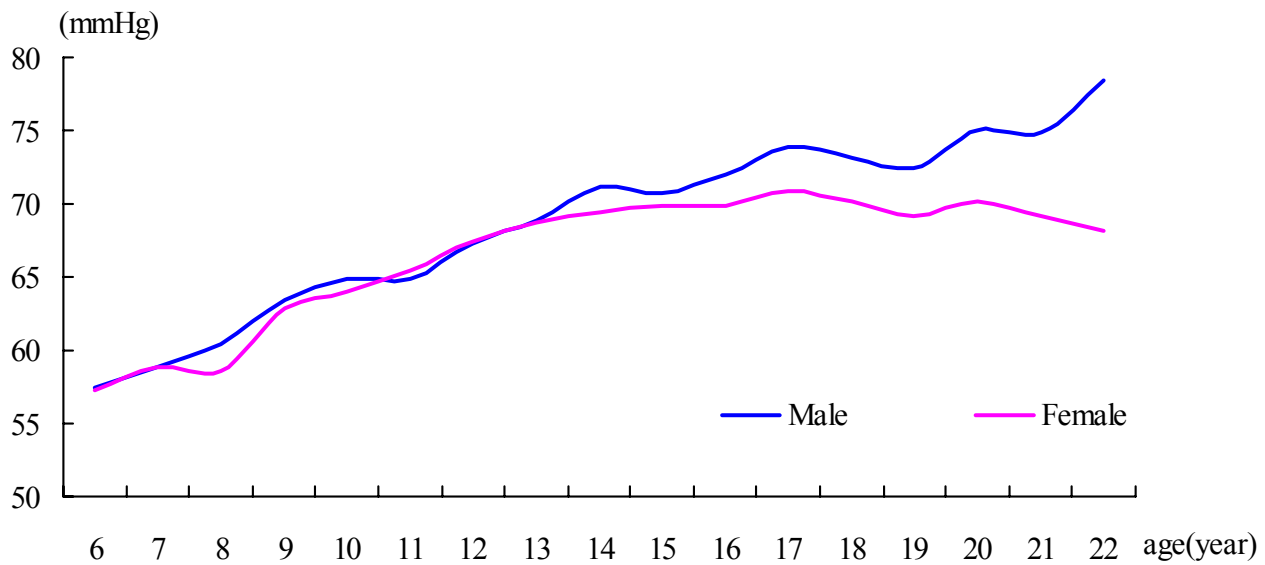


Figure 2-2-1-32 Average diastolic pressure of students

Pressure difference of the students increased slowly as age increased between age 6~22, with no significant difference in the rate of increase between age groups. The average pressure difference ranged from 34.8~46.2 mmHg for males and 32.6~41.4 mmHg for females. Pressure difference of males was obviously higher than females ( $P < 0.01$ ) at age 6, 8 and after age 12, and no significant difference among genders was seen in other age groups (table 3-2-4-4, figure 2-2-1-33).

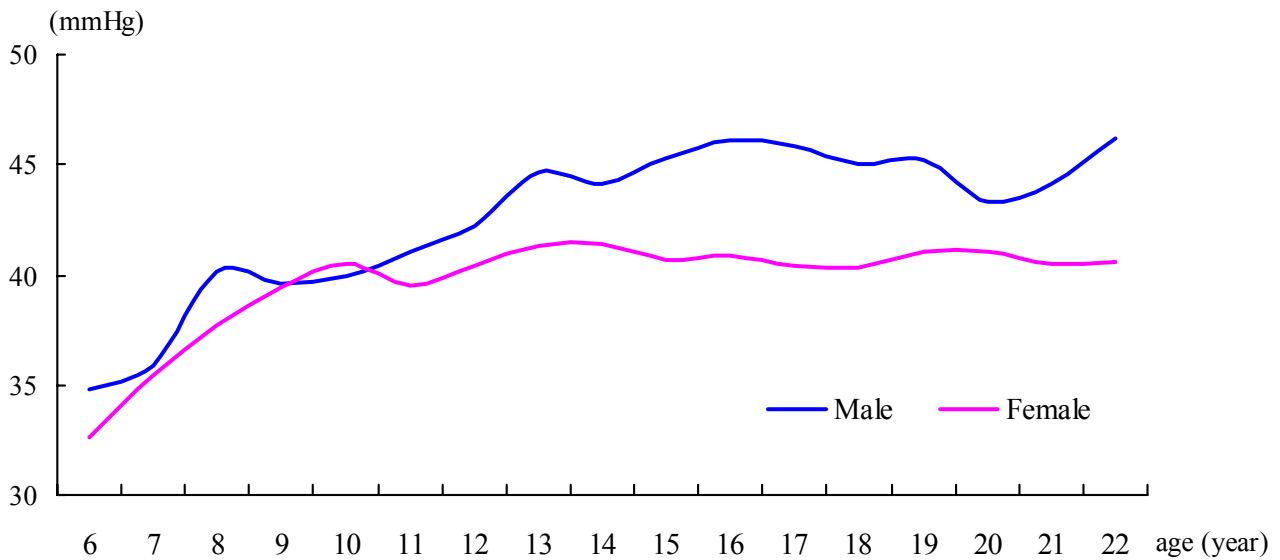


Figure 2-2-1-33 Average pressure difference of students

### 2.1.4.3. Vital capacity

Vital capacity refers to the maximum amount of air that can be exhaled after a maximum inhalation. This indicates maximum working capacity of the respiratory system of the human body.

The average vital capacity of students at age 6~22 increased tremendously as age increased, with a greater increase in rate between age 6~17 for males and 6~14 for females. The increase ranged from

133.1~462.3 ml and 137~272.5 ml for males and females, respectively, and the rate of increase remained fairly stable thereafter. The average vital capacity of males and females ranged from 1068.7~4170.9 ml and 987.5~2843.6 ml, respectively. Except at age 10 and 11, vital capacity of males was generally higher than females of the same age group ( $P < 0.01$ ). Particularly after age 15, the average vital capacity difference between males and females was above 1000 ml (table 3-2-4-5, figure 2-2-1-34).

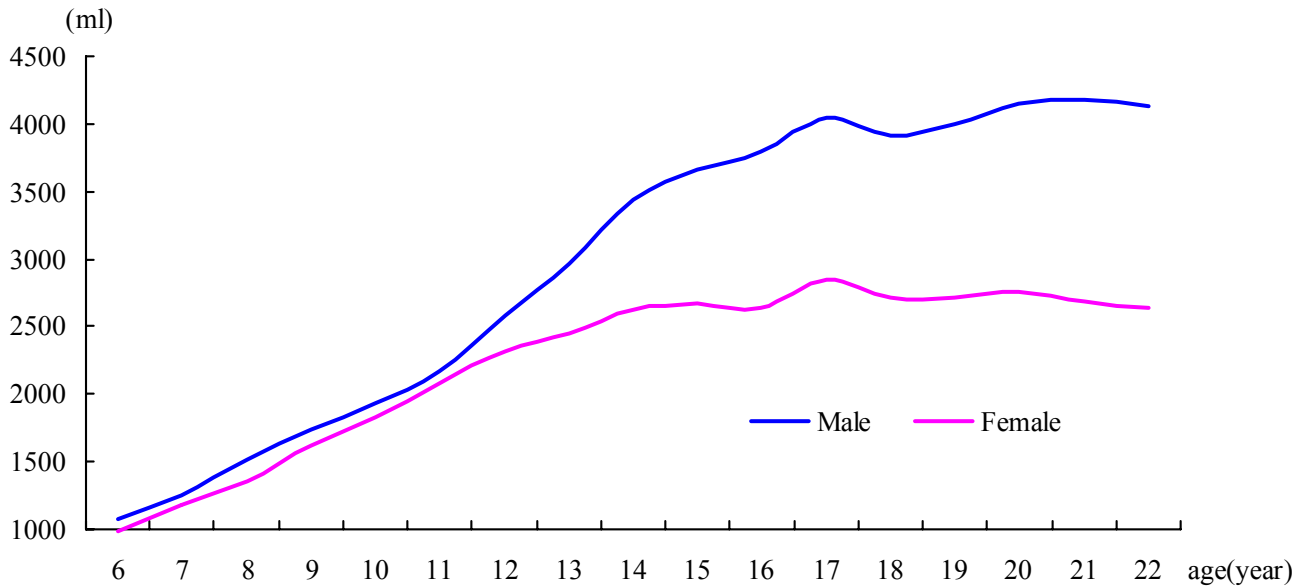


Figure 2-2-1-34 Average vital capacity of students

The average vital capacity/weight of students aged between 6~22 increased slowly as age increased. The change in male vital capacity varied slightly between age 6~12, ranging from 48.3~57.7 ml/kg, but increased apparently between age 13~19 (except at age18), from 59.2 to 67.4 ml/kg. Female vital capacity varied slightly before the age of 17, ranging from 46.2~53.0 ml/kg, and reached maximum at age 17 and remained stable after age 18. The average vital capacity/weight of males (48.3~67.4 ml/kg) was significantly higher than females (46.2~54.8 ml/kg) ( $P < 0.01$ ), especially at the age of 15~21 when the vital capacity of males was 10 ml/kg or more than females (table 3-2-4-6, figure 2-2-1-35).

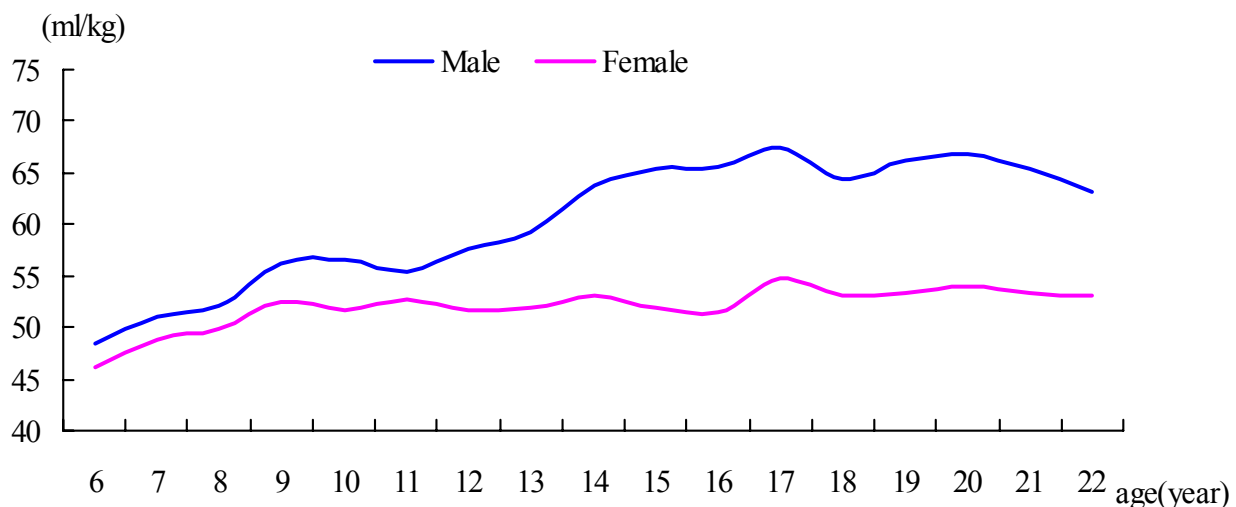


Figure 2-2-1-35 Average vital capacity/weight of students

2.1.5. Physical Fitness

2.1.5.1. Speed

50-m run was used to reflect the speed of students.

Average speed of male and female students ranged from 7.8~12.6 seconds and 9.7~13.5 seconds, respectively. The highest value for both males and females was at age 6. Average time to finish the run decreased as age increased before age 18 (males) and 14 (females), and the time remained unchanged or increased slightly afterwards. The results showed that speed increased as age increased. Speed of the male students kept increasing from age 6 to 18 with a statistical difference among age groups ( $P < 0.05$ ), and remained stable thereafter. For female students, the speed kept increasing from age 6 to 11, with significant difference among age groups ( $P < 0.05$ ), and remained stable or decreased slightly thereafter (table 3-2-5-1).

The rate of increase in speed was much greater in males than females as age increased. The speed of male students was significantly faster than females in all age groups ( $P < 0.05$ ). The difference in speed increased with the greatest difference of 2.3 seconds between males and females after age 11 (figure 2-2-1-36).

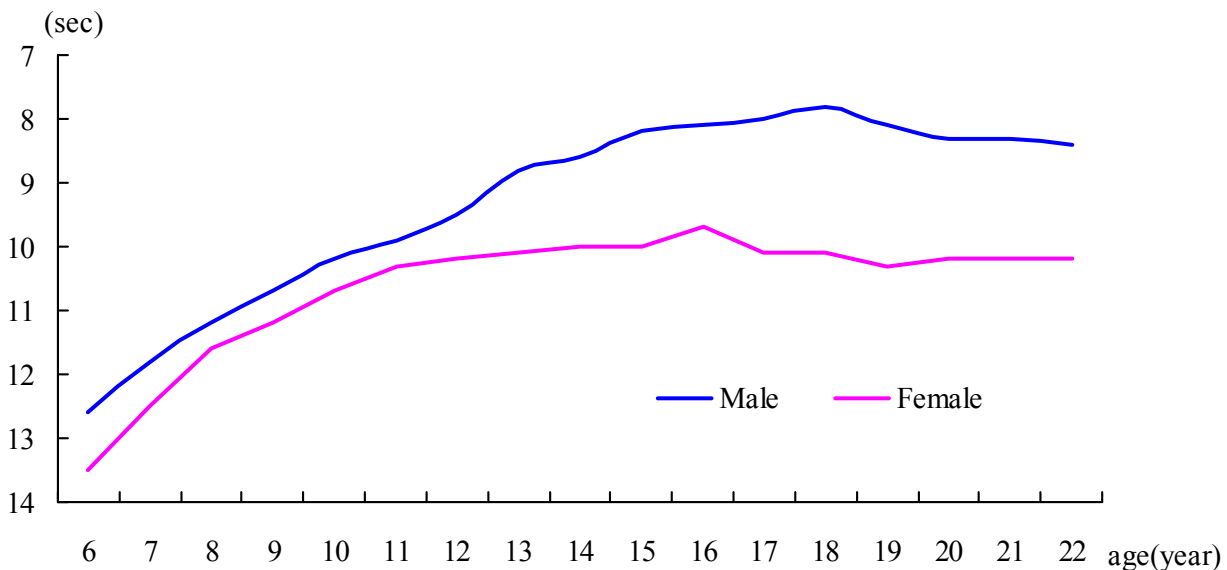


Figure 2-2-1-36 Average time of 50-meter run of students

2.1.5.2. Strength

Strength of students was reflected by standing long jump, vertical jump, pull-ups (pull-ups with body inclined), one-minute sit-ups, grip strength and back strength reflect. Standing long jump and vertical jump reflected mainly explosive force, pull-ups (pull-ups with body inclined) and one-minute sit-ups reflected mainly endurance. Grip strength and back strength reflected maximum force that the muscle can exert.

Average indexes for male students ranged as follows: standing long jump 105.5~207.6 cm, vertical jump 19.3~42.5 cm, pull-ups (pull-ups with body inclined) 0.8~3 times (14.3~21.3 times), grip strength

7.7~42.5 kg and back strength 24~108.9 kg. Average indexes for female students ranged as follows: standing long jump 92~145.1 cm, vertical jump 16.9~26.1 cm, one-minute sit-ups 9.3~25.6 times/minute, grip strength 7~22.7 kg and back strength 19.7~55.7 kg (table 3-2-5-2,table 3-2-5-3,table 3-2-5-4,table 3-2-5-5,table 3-2-5-6).

All indexes increased as age increased, but the degree of increase was not the same for each index. For example, the standing long jump of male students aged 6~22 increased over 1 fold while their grip and back strengths increased nearly 4 folds.

All aspects in strength were stronger in males than females and the rate of increase was greater than females as well. The strength and speed of male students increased quite rapidly before age 18 and increased slowly thereafter. Strength of females increased mildly between age 11~13, and endurance decreased as age increased after age 17 (figure 2-2-1-37,figure 2-2-1-38,figure 2-2-1-39,figure 2-2-1-40,figure 2-2-1-41).

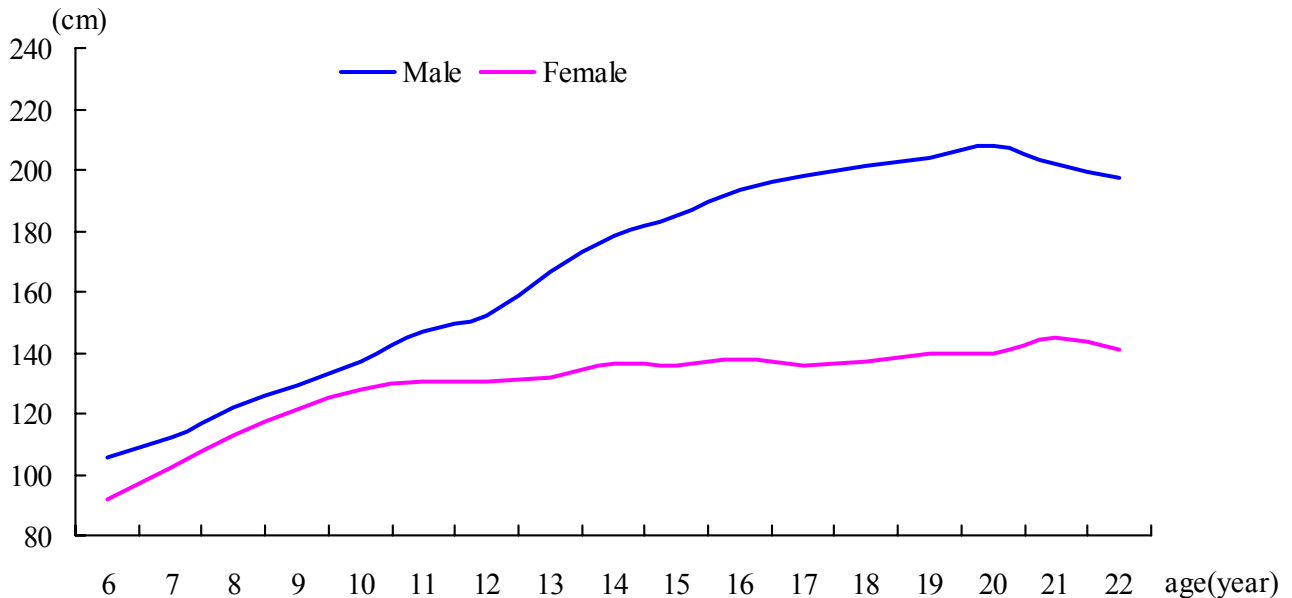


Figure 2-2-1-37 Average standing long jump of students

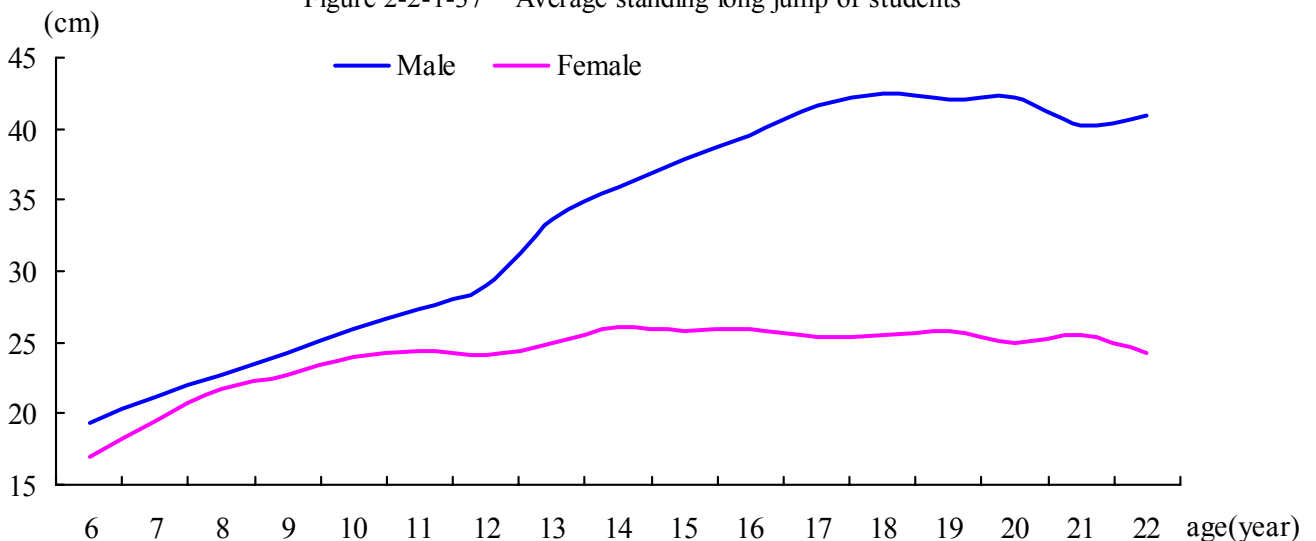


Figure 2-2-1-38 Average vertical jump of students

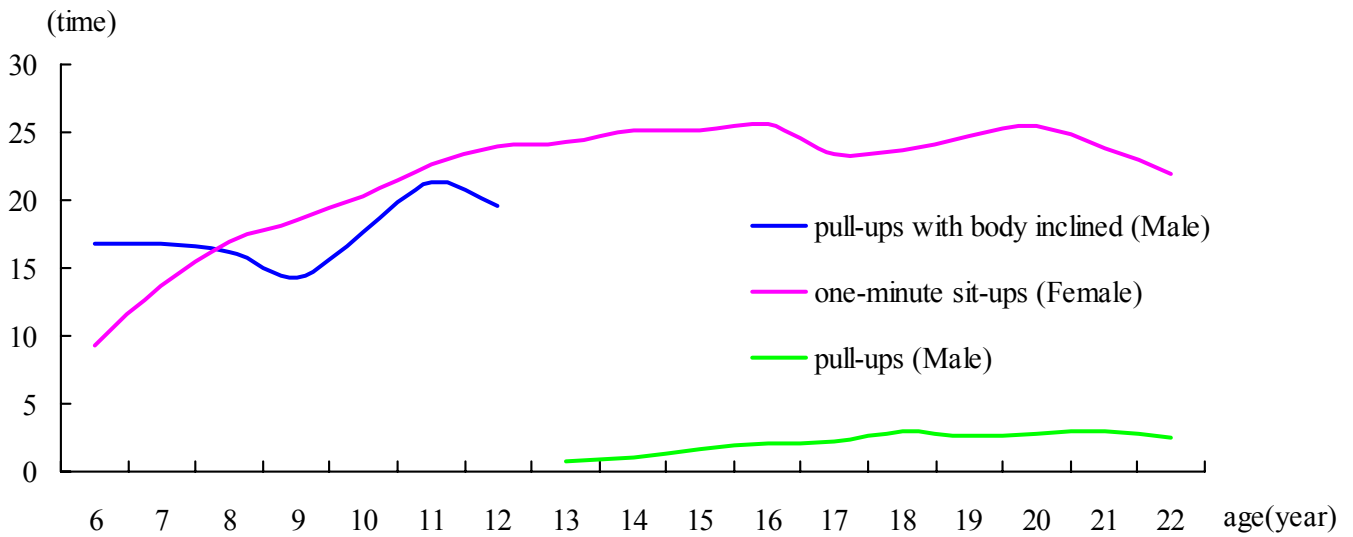


Figure 2-2-1-39 Average pull-ups with body inclined, one-minute sit-ups and pull-ups of students

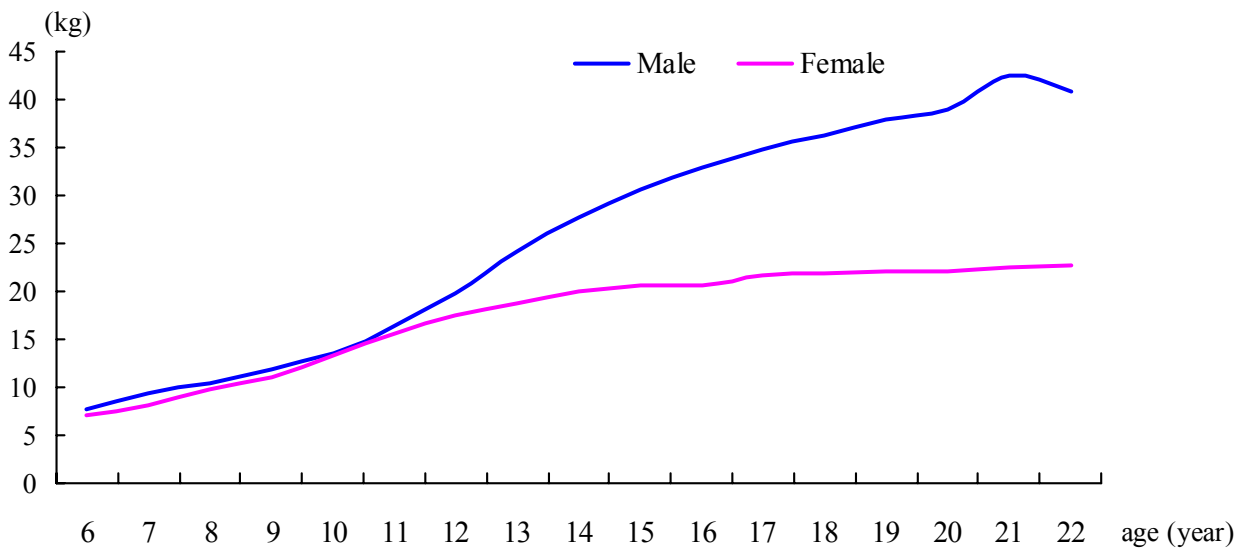


Figure 2-2-1-40 Average grip strength of students

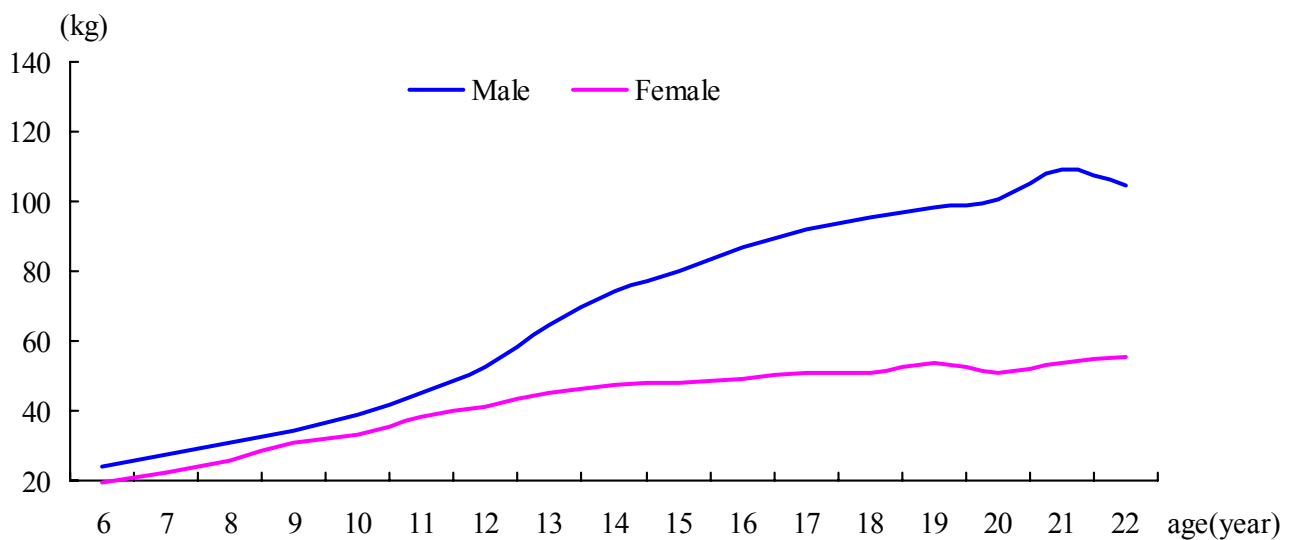


Figure 2-2-1-41 Average back strength of students

2.1.5.3. Endurance run

The endurance of students aged 6~12 was reflected by the 50 m X 8 back and forth run, the endurance of male students aged 13~22 was reflected by 1000-m run and the endurance of female students aged 13~22 was reflected by 800-m run.

Average time for male students to finish the 50 m X 8 run and 1000 m run ranged from 119.2~152.8 seconds and 286.6~333.1 seconds, respectively. Average time for female students to finish the 50 m X 8 run and 800 m run ranged from 128.3~159.2 seconds and 280.6~295 seconds, respectively (table 3-2-5-7).

The endurance of males increased with age before age 16, whereas the endurance of females increased with age before age 14. After that, endurance of both genders decreased as age increased. No statistical difference was seen in endurance between males and females before age 10 (figure 2-2-1-42,figure 2-2-1-43).

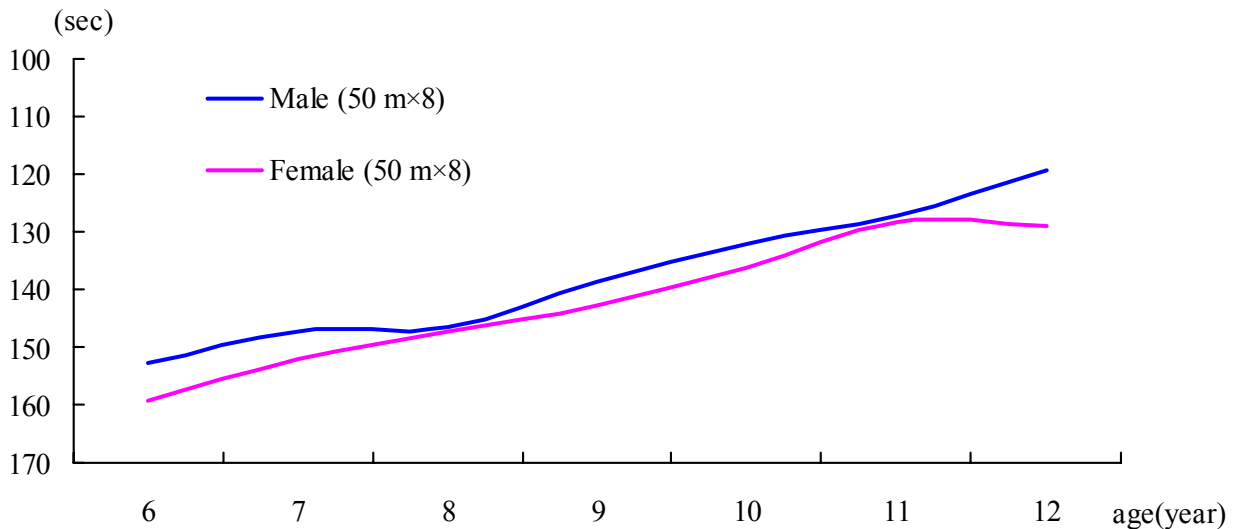


Figure 2-2-1-42 Average time of 50m x 8 endurance run in primary school students

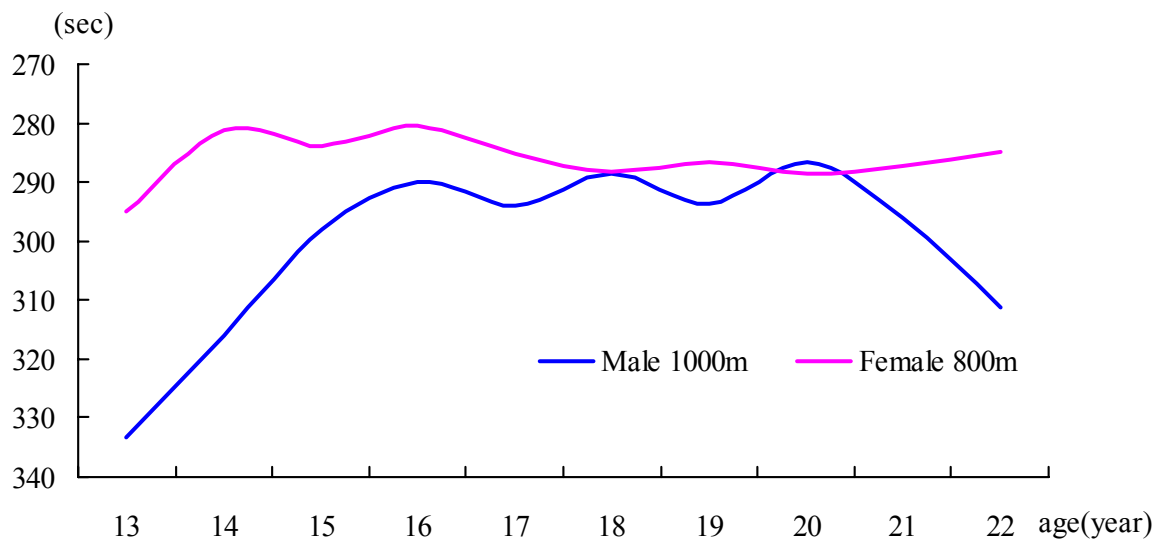


Figure 2-2-1-43 Average time of 1000m endurance run of secondary school and university students

2.1.5.4. Flexibility

Sit and reach was used to reflect flexibility.

The average sit and reach results of male and female students ranged from 0.1~5.8 cm and 4.1~8.7 cm, respectively (table 3-2-5-8). Flexibility of males decreased as age increased between age 6~12, and tended to increased with age after age 13. Flexibility of females fluctuated as age increased. Females had better flexibility than males, especially among age 6~15, with a significant difference varying between 2 and 5.5 cm ( $P < 0.01$ ) (figure 2-2-1-44).

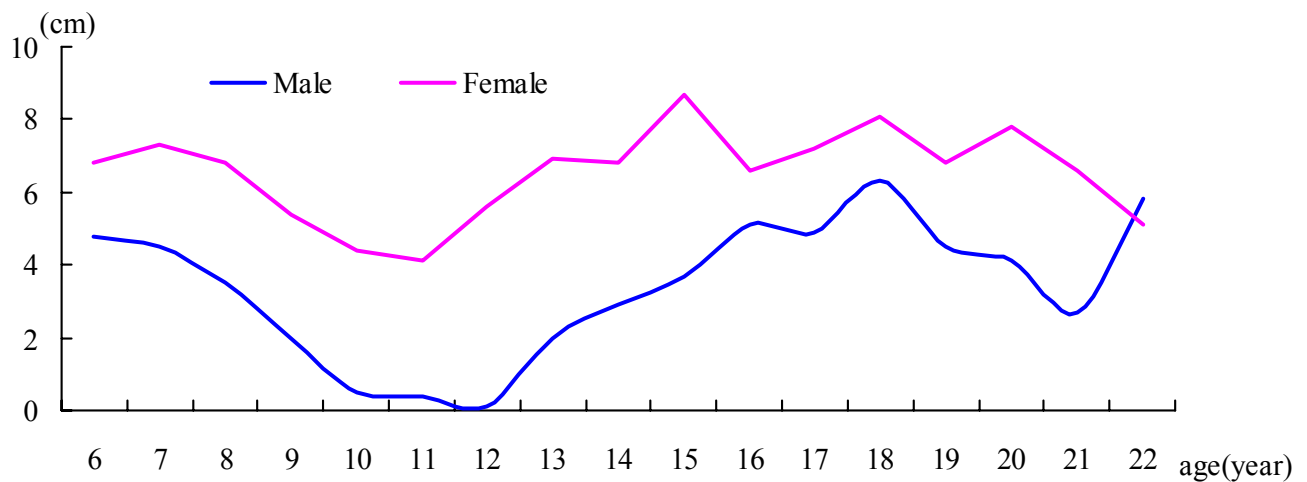


Figure 2-2-1-44 Average sit and reach of students

2.1.5.5. Respond

Selective respond time was used to reflect the ability to react.

Average respond time of males and females ranged from 0.37~0.57 sec and 0.42~0.62 sec, respectively (table 3-2-5-9). Reaction ability of both genders improved as age increased, especially among age 6~12. During that period, selective respond time of males and females improved by 0.16 second and 0.17 second, respectively. Males responded better than females ( $P < 0.01$ ), with little difference before age 9 and bigger difference thereafter (figure 2-2-1-45).

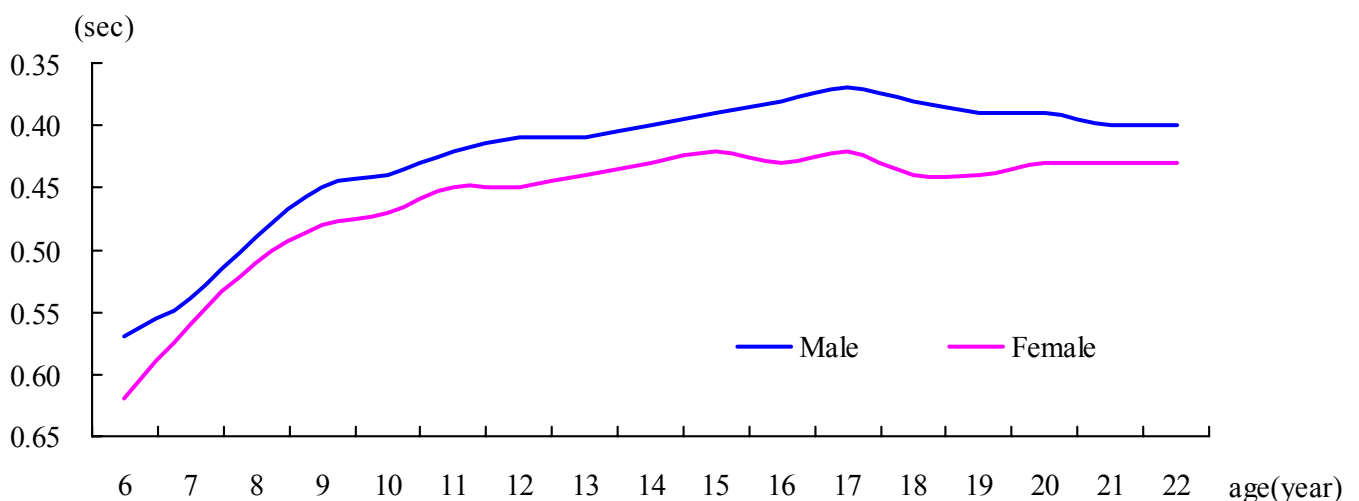


Figure 2-2-1-45 Average respond time of students



2.1.5.6. Balance

One foot stands with eyes closed (OFSEC) was used to reflect balance ability.

The average time for the OFSEC of males and females ranged from 14.5~62.7 sec and 14.7~60.5 sec, respectively (table 3-2-5-10). Balance ability of males kept increasing with age to 3.32 folds. Balance ability of females also increased with age before age 15 to nearly 2 folds, and then tended to decrease thereafter. No significant difference among genders in balance (figure 2-2-1-46).

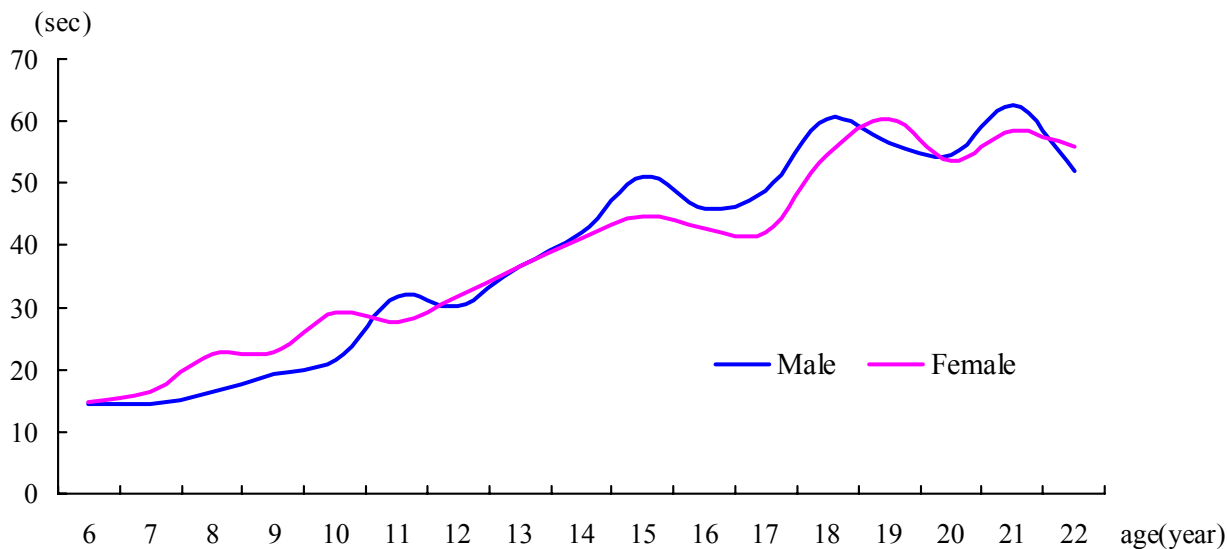


Figure 2-2-1-46 Average OFSEC time of students

2.1.6. Health

2.1.6.1. Occurrence of decayed primary teeth

Dental decay of primary teeth of male and female students occurred mainly between age 6~12. With the substitution of primary teeth by permanent teeth, most students do not have primary teeth dental decay after age 14.

The proportion of primary teeth dental decay of students increased slightly between age 8 and 9, and declined gradually after age 9. The changes were similar for both males and females. The highest percentage 65.3 % (males) and 71.9 % (females) of dental decay occurred at age 9 for males and 8 for females. The occurrence of primary teeth decay decreased to 13.8 % at age 12, 9.7 % at age 13 and 4.3 % at age 14 for males. For females, primary teeth dental decayed decreased to 8% % at age 12, 5 % at age 13 and 4.0 % at age 14. Percentage of primary teeth dental decay ranged from 0.0%~65.3% (males) and 0.0%~71.9% (females), respectively (table 3-2-6-1).

Percentage of primary teeth dental decay was significantly higher in males than females. The largest difference among genders in primary teeth decay was seen between age 9~12 ranging from 4.7%~16.2% (P < 0.05) (figure 2-2-1-47).

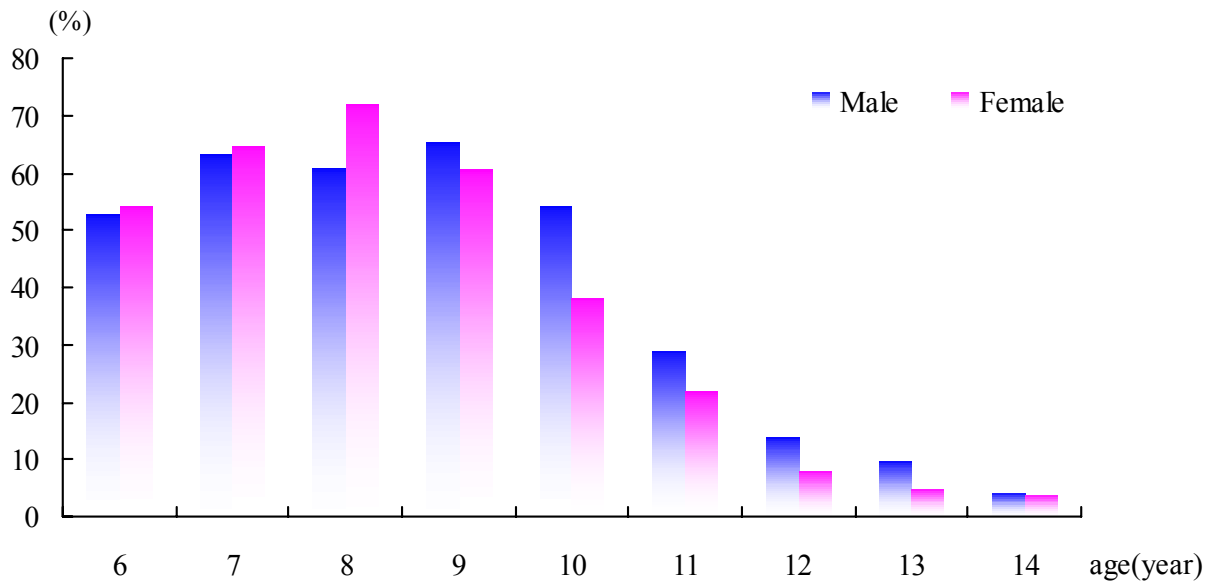


Figure 2-2-1-47 Proportion of primary teeth decay in students

Percentage of decayed primary teeth being filled in males varied irregularly as age increased. The highest percentage of decayed primary teeth being filled occurred at age 8 in females (34.9%) and at age 9 in males (28.7%), and decreased to 5.1 % at age 12 and 1.6 % at age 13 in males. For females, the proportion of filled primary teeth varied more regularly by increasing gradually from age 6 to 8, reaching a maximum of 34.9 %, and then declining gradually to 2.3 % by age 12 and 0 % at age 13. Percentage of decayed primary teeth being filled ranged from 0.0%~28.7% (male) and 0.0%~34.9% (female) (table 3-2-6-1).

Between ages 6~18, males had a higher percentage of decayed primary teeth being filled than females at all ages, except at age 6, 8 and 11. The difference was significantly greater at age 7 and 8, accounting for 10.9 % and 13.4 %, respectively ( $P < 0.05$ ) (figure 2-2-1-48).

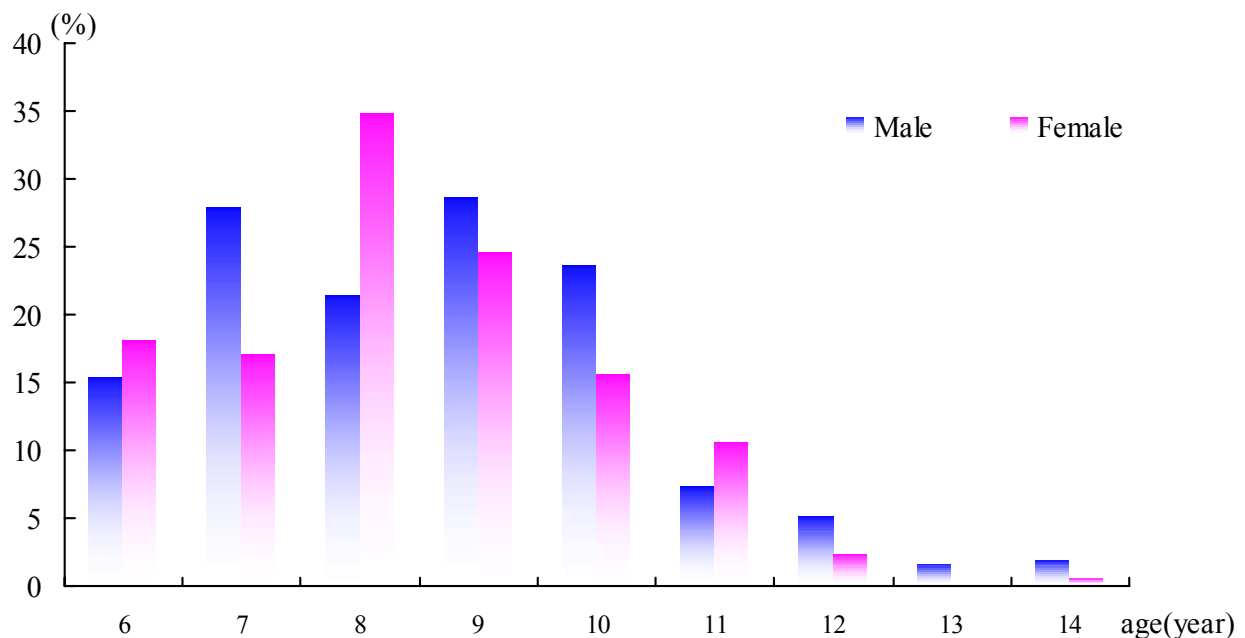


Figure 2-2-1-48 Proportion of decayed primary teeth filled in students

The percentage of decayed primary teeth loss of both males and females reached two peaks. The first peak was at age 8 which were 4.1 % (males) and 5.5 % (females). After that, decayed primary teeth loss of males decreased rapidly to 0.6 % at age 10, increased again at age 11 (1.3 %), reaching the second peak and then decreased rapidly again to 0.5 % at age 12 and 0 % thereafter. For females, decayed primary teeth loss increased slightly after age 6, the rate was 5.5 % at age 8, 0 % at age 10 and 11, reaching the second peak at 0.6 % at age 12 and then decreased to 0 % thereafter. The percentage of decayed primary teeth loss in males and females ranged from 0.0%~4.1% % and 0.0%~5.5% %, respectively (table 3-2-6-1).

Females had significantly higher percentage of decayed primary teeth loss than males, except at age 9, 10, and 11 ( $P < 0.05$ ) (figure 2-2-1-49).

It was found that the dmf of females was lower than males with a difference ranging from 1.3%~17.8% except at the age of 8 (figure 2-2-1-50).

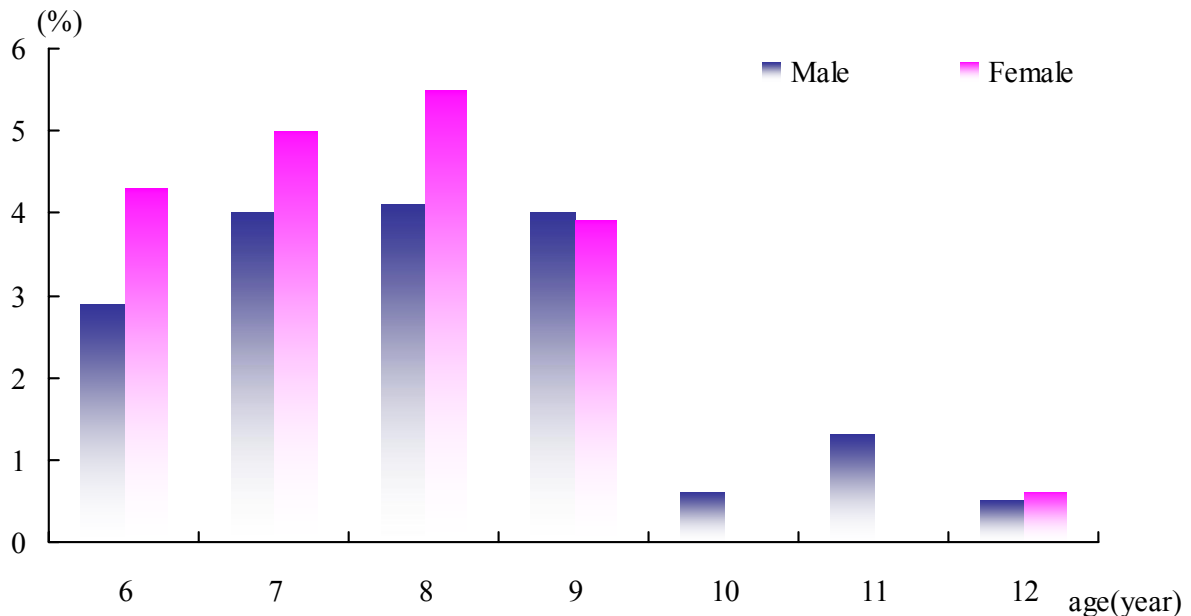


Figure 2-2-1-49 Proportion of decayed primary teeth loss in students

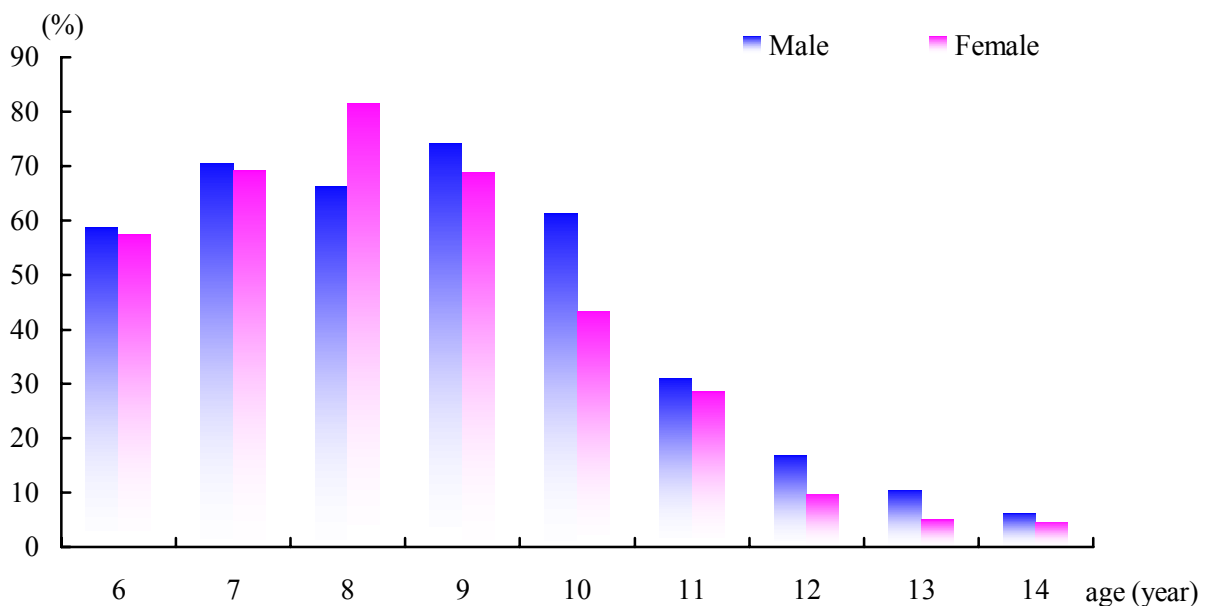


Figure 2-2-1-50 Porportion of primary teeth decayed, loss and filled (dmf) in students

2.1.6.2. Occurrence of decayed permanent teeth

Occurrence of dental decay in permanent teeth appeared at age 6, with an occurrence of 2.9 % (male) and 1.1 % (female) between age 6~18, and occurrence increased with age. The percentage of permanent teeth dental decay of males increased rapidly between age 6~7, 8~9, 12~14 and 16~17, reaching the highest percentage (47.9 %) by age 15. The changes were larger between age 6~8 and 11~14 for females, reaching the maximum (51.7 %) at age 14, and declined slowly as age increased till age 18. The proportion of permanent teeth decay of males and females ranged from 2.9~47.9% and 1.1~51.7%, respectively (table 3-2-6-2).

Females had a higher proportion of dental decay in permanent teeth than males except at age 6 and 8 (where proportion in males was slightly higher than females), with a difference of 2.4~9% between both sexes and no significant difference among genders was seen (figure 2-2-1-51).

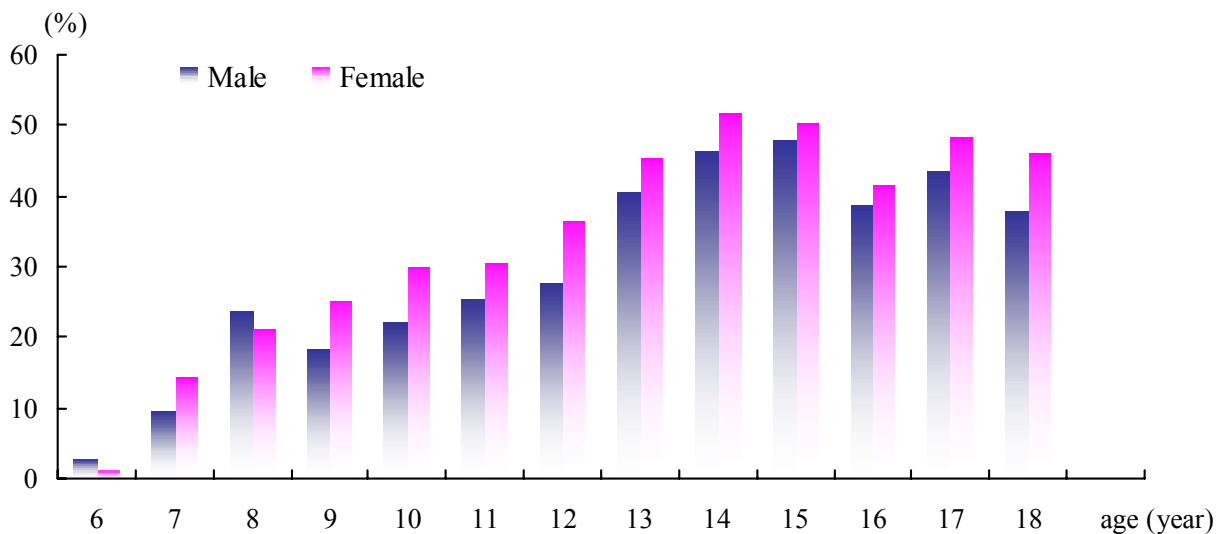


Figure 2-2-1-51 Proportion of permanent teeth decay in students

Decayed permanent teeth filled began at age7 in both sexes. The proportions were 4% (males) and 6.9% (females) and increased gradually with age. Proportion reached a peak at age17 in males (39.8%), of which the most significant increase occurred at age7~13 and 15~17. For females, the peak was seen at age16 (49.2%). The proportion of decayed permanent teeth filled in male and female ranged from 0.0%~39.8% and 0.0%~49.2%, respectively (table 3-2-6-2).

The proportion of decayed permanent teeth filled in females was higher than males except for age 10 (where proportion in males was slightly higher than females). The difference was relatively large at the 14~18 age groups (except at age17) with a significant difference of 10.6~16.6%, (P < 0.05) (figure 2-2-1-52).

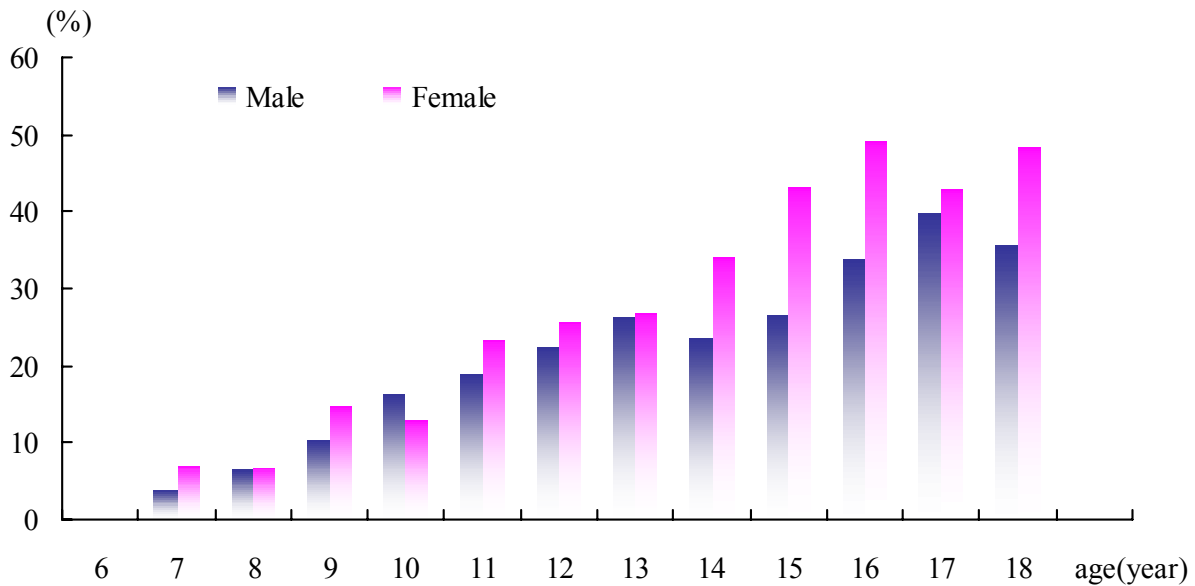


Figure 2-2-1-52 Proportion of decayed permanent teeth filled in students

Decayed permanent teeth loss was first found at age 8 (females) and 11 (males) with occurrence at 0.7 % and 1.3 %, respectively. The percentage reached a maximum of 2.8 % in males by age 18, with the occurrence ranging from 0.0%~2.8%. There was one case of decayed permanent teeth loss at the age group of 8 in females, and that repeated again at age 12. At the 12~18 age groups, the difference ranged from 1.1%~4.3%.

The proportion of decayed permanent teeth loss was higher in females than males (except at the age of 11 and 16, where the proportion was slightly higher in males) and significant difference was observed at the age of 12 ( $P < 0.05$ ) (figure 2-2-1-53).

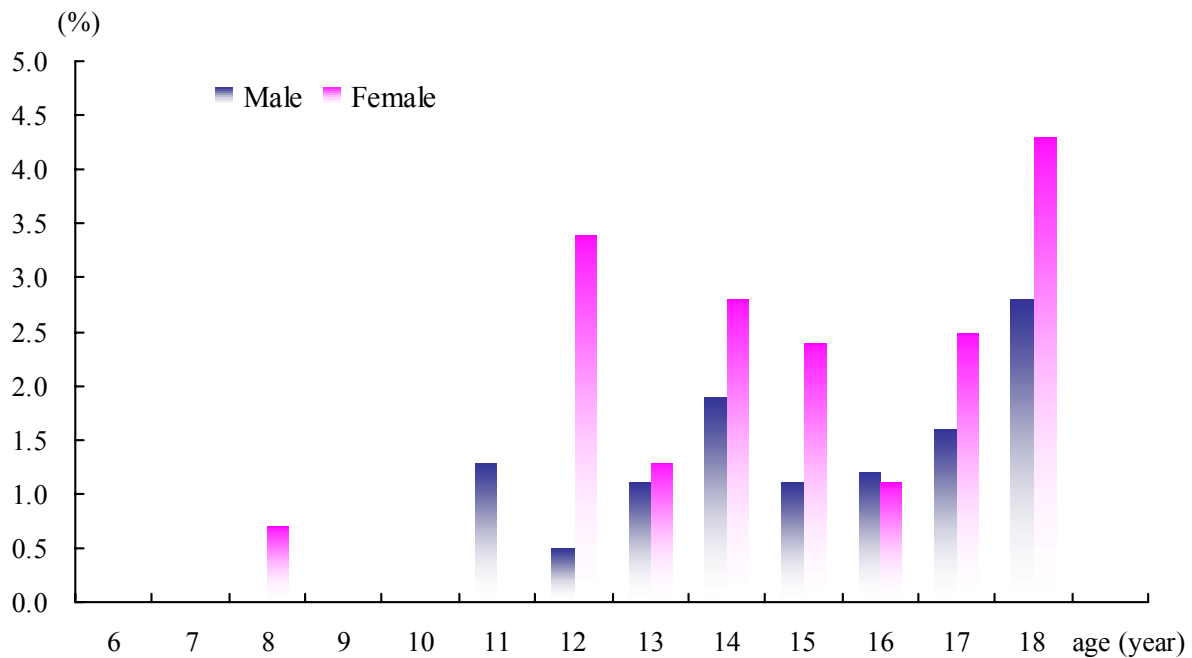


Figure 2-2-1-53 Proportion of decayed permanent teeth loss in students

Males had a higher proportion of DMF than females at the age groups of 6 and 8 with difference ranging from 1.8%~2.5%, In other age groups, the proportion of DMF was higher in females than in males, with difference ranging from 3.8%~18.2% (figure 2-2-1-54).

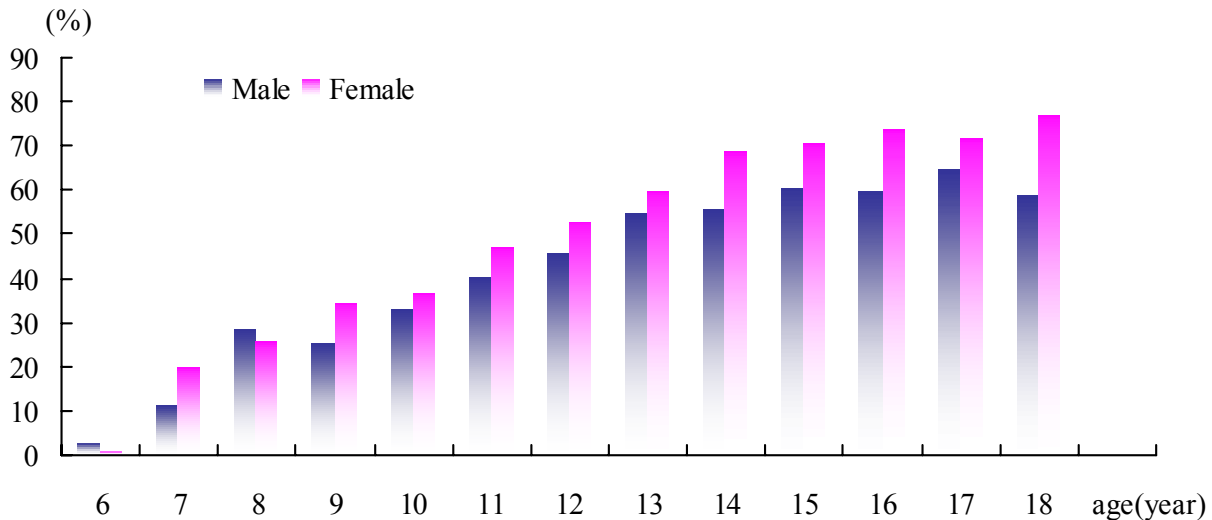


Figure 2-2-1-54 Proportion of permanent teeth decayed, loss and filled (DMF) in students

**2.1.6.3. Poor eyesight**

Poor eyesight is defined as eyesight falling below 5.0 without using glasses or contact lens. An eyesight of 4.9 is considered as mild poor eyesight, eyesight within 4.6~4.8 is considered as moderate poor eyesight and the eyesight below or equal to 4.5 is severe poor eyesight. If the eyesight was different in both eyes, the one with poorer eyesight was used. A subject was considered as a unit when doing the analysis.

The proportion of poor eyesight increased slowly from age 6~22, reaching a peak of 86.5 % at age 20 in males. The proportion of poor eyesight was lowest at age 6 (46.2%), and the increase was greatest at age groups 9~10 (9.6%), 14~15 (6%) and 18~19 (10.5 %). Poor eyesight decreased slightly after age 20 but remained at about 70 %. The proportion of poor eyesight in males ranged from 46.2%~86.5% (table 3-2-6-3,figure 2-2-1-55).

The proportion of mild and moderate poor eyesight ranged from 2.1%~22.1 and 9.1%~29.5%, respectively, and occurrence of poor eyesight was more than 20 % at age 9, 10, 12, 21 and 22. Severe poor eyesight increased quickly with age, reaching the peak at age 20 (66.7 %), and ranged from 11.5%~66.7% (table 3-2-6-3).

For females, the proportion of poor eyesight increased slowly between age 6~22, the proportion reached a peak of 86.5 % at age22 and remained at over 80 % at age 14~22. The proportion of poor eyesight in females ranged from 38.3%~86.5% (table 3-2-6-3, figure 2-2-1-55).

The proportion of mild poor eyesight for females ranged from 1.1%~18.1%, and increased as age increased before age 13 and decreased thereafter. Moderate eyesight ranged from 8.3%~26.0%, and

fluctuated among age groups with the highest percentage at age 8 (26.0 %) and the lowest percentage at age 21 8.3 %). Severe poor eyesight ranged from 6.4%~71.9%, and increased quickly with age, reaching the peak (71.9 %) at age 21 and remained over 60 % after age 15 (table 3-2-6-3).

Females had a higher percentage of poor eyesight compared to males, with the exception of age 6, 10 and 20. The smallest difference (1 %) between males and females was seen at age 13, and the largest difference (>6 %), which was significant was found at age 9, 14~18, 21 and 22, and the percentage difference reached over 10 % at age 18, 21 and 22 (figure 2-2-1-55).

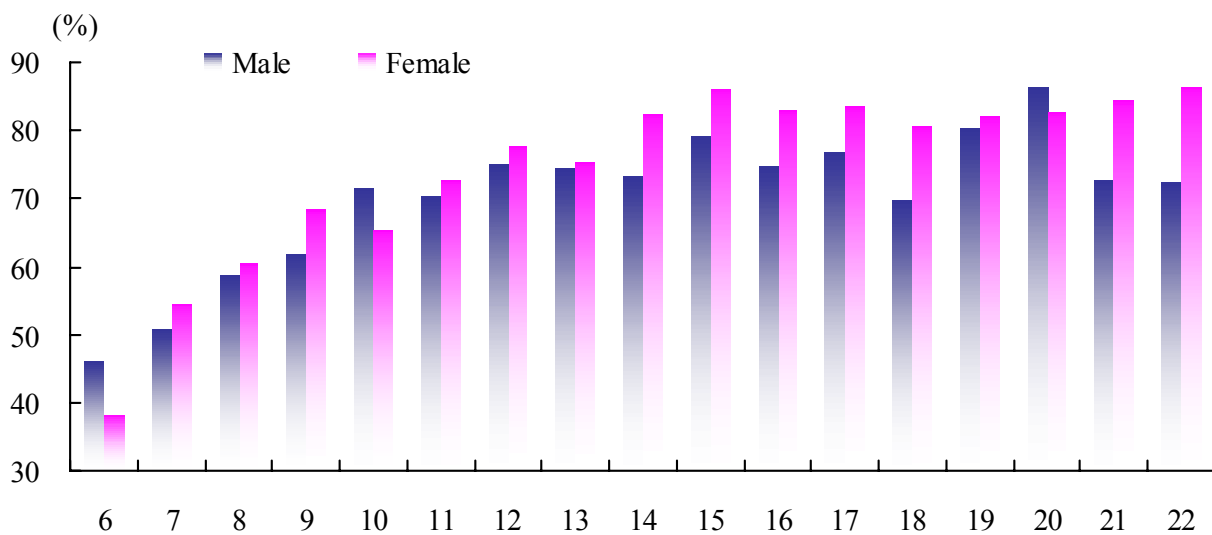


Figure 2-2-1-55 Proportion of poor eyesight in students age(year)

The proportion of nearsightedness of students with increased with age, reached the first peak at age 15, then decreased slightly at age 16~18, and increased with age again at age 18. Males had a higher proportion of nearsightedness than females at age 6, 12 and 20, and females had a higher proportion than males in other age groups (figure 2-2-1-56).

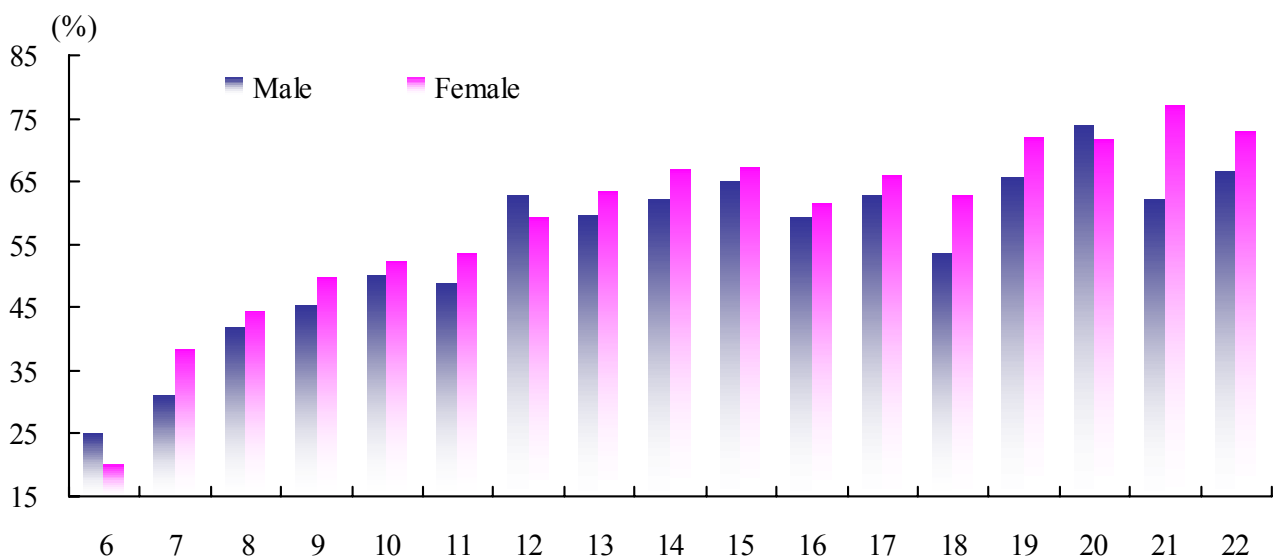


Figure 2-2-1-56 Proportion of nearsightedness in students age (year)

2.1.6.4. Color vision

Color vision is used to reflect the children and adolescents' ability to distinguish colors.

The proportion of male with abnormal color vision showed a "U" shaped curve across age and fluctuated among age groups. Abnormal color vision reached a peak of 28.7 % at age 8 in male students, declined gradually as age increased thereafter, then to the lowest of 2.9 % at age 19 and eventually increased to a second peak of 17.0 % at age 21. Abnormal color vision of female students reached a peak of 23.3 % at age 7, decreased as age increased to 0 % at age 19, 20 and 22; however, one student was found with abnormal color vision at age 21. The proportion of abnormal color vision for male and female students ranged from 2.9%~28.7% and 0.0%~23.3%, respectively (table 3-2-6-4).

The proportion of abnormal color vision in females was only higher than males in the age group of 7. For all other age groups, the proportion was higher in males than females (figure 2-2-1-57).

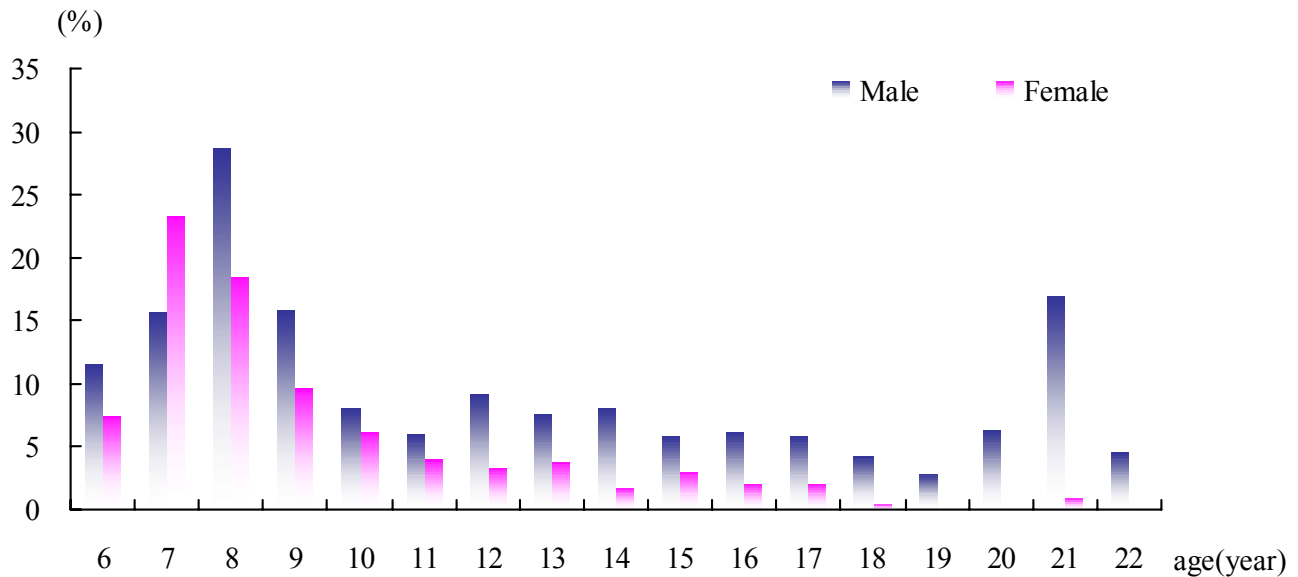


Figure 2-2-1-57 Proportion of abnormal color vision in students

2.2. Comparison of 2005 and 2010 Physical Fitness Results of Macao Children and Adolescents (Students)

2.2.1. Comparison of Basic Information of the Subjects

5339 and 5130 subjects were drawn randomly in the 2005 and 2010 physical fitness study, respectively. The communities in the two studies were consistent.

The 2010 and 2005 birthplace results were consistent, both showed that the birthplace order of university, secondary and primary school students were Macao, Mainland China, Hong Kong and other countries (regions). People born in Hong Kong and Mainland China increased whereas no student was born in Portugal (table 2-2-2-1).



Table 2-2-2-1 Comparison of birthplaces in students (%)

Gender	Birthplace	Year	6~12 years (primary school)	13~18 years (secondary school)	19~22 years (university)	Total	
M	Mainland China	2010	12.2	11.4	20.8	13.1	
		2005	5.5	14.5	14.6	10.2	
	Macao	2010	82.9	85.5	74.5	82.7	
		2005	91.7	81.7	81.6	86.5	
	Hong Kong	2010	2.3	1.9	4.5	2.5	
		2005	1.4	3.1	3.0	2.3	
	Portugal	2010	0.0	0.0	0.0	0.0	
		2005	0.1	0.1	0.0	0.1	
	Others	2010	2.6	1.2	0.3	1.7	
		2005	1.3	0.6	0.7	0.9	
	F	Mainland China	2010	11.4	13.5	25.5	14.6
			2005	6.0	10.9	17.2	9.8
		Macao	2010	84.7	84.3	71.9	82.4
			2005	91.4	85.5	80.1	87.2
Hong Kong		2010	2.5	1.5	2.6	2.1	
		2005	1.2	3.0	1.7	2.0	
Others		2010	1.4	0.7	0.0	0.9	
		2005	1.3	0.5	1.0	0.9	

### 2.2.2. Comparison of Lifestyle

In this study, lifestyle information of the children and adolescents (aged 6~22) was examined. These included habits, physical education at school, extracurricular physical exercise and occurrence of diseases.

#### 2.2.2.1. Habits

For habits, 7 areas were examined: daily accumulated traveling time and transportation means back and forth from home to school and transportation means, hours of outdoor activities after school, hours of doing daily homework at home, hours of watching TV, video and playing computer games, average hours of daily sleeping (included nap time) and involvement of extracurricular activities (hobby class) were examined.

The study showed that students taking less than 30 minutes daily in traveling back and forth from home to school accounted for the highest proportion in both 2005 and 2010, with no significant difference in traveling hours among different age groups. However, the proportion of university students taking 30 minutes ~1 hour was higher than that in primary and secondary school students, and especially, the proportion of students taking 2 hours or more was significantly lower than that in 2005 (table 2-2-2-2 and table 2-2-2-3).

**Table 2-2-2-2 Comparison of commuting hours in male students (%)**

Age group	Year	Less than 30 minutes	30 minutes~1 hour	1~2 hours	2 hours or more
Primary school	2005	70.7	23.3	5.3	0.8
	2010	73.2	22.2	4.1	0.5
Secondary school	2005	59.4	28.9	9.9	1.8
	2010	62.5	29.2	7.6	0.7
University	2005	43.7	39.2	15.4	1.7
	2010	51.1	38.4	10.0	0.3

**Table 2-2-2-3 Comparison of commuting hours in female students (%)**

Age group	Year	Less than 30 minutes	30 minutes~1 hour	1~2 hours	2 hours or more
Primary school	2005	69.0	24.5	5.1	1.3
	2010	72.7	23.1	3.7	0.5
Secondary school	2005	58.6	29.3	10.9	1.3
	2010	59.3	31.6	8.5	0.6
University	2005	38.0	41.1	18.9	1.9
	2010	44.3	37.6	17.4	0.7

Significant difference was seen in the traveling time in 2010 and 2005 ( $P < 0.05$ ). No significant difference was found in transportation means.

Students spending less than 30 minutes daily in outdoor activities after school accounted for the highest proportion in the both 2010 and 2005, and there was significant difference among university students in 2010 and 2005 ( $P < 0.05$ ), as revealed by the fact that the proportion of students spending less than 30 minutes in 2010 (59.1%) was significantly higher than that in 2005 (49.3%) (table 2-2-2-4).

**Table 2-2-2-4 Comparison of daily hours spent on outdoor activities in university students**

Time spent on outdoors activities	Year	Proportion (%)
Less than 30 minutes	2005	49.3
	2010	59.1
30 minutes~1 hour	2005	26.6
	2010	23.3
1~2 hours	2005	14.0
	2010	11.2
2 hours or more	2005	10.1
	2010	6.4

The proportion of students spending 30 minutes~1 hour daily in doing homework at home accounted for the highest proportion. Significant difference was seen on length of time doing homework among secondary students between 2010 and 2005 ( $P < 0.05$ ), as revealed by the fact that the proportion of students spending 2~3 hours in 2010 (15.2%) was significantly higher than that in 2005 (6.8%), of which

the proportion of male students doing homework for 2~3 hours daily increased to 13.5% in 2010 from 4.8% in 2005, and 16.9 % in 2010 from 8.8 % in 2005 among female students (table 2-2-2-5).

**Table 2-2-2-5 Comparison of time spent on homework in secondary school students (%)**

Year	Time spent on homework	Male students	Female students
2005	Less than 30 minutes	32.8	23.3
	30 minutes~1 hour	38.6	36.1
	1~2 hours	21.3	26.4
	2~3 hours	4.8	8.8
	3 hours or more	2.5	5.5
2010	Less than 30 minutes	21.5	12.4
	30 minutes~1 hour	32.1	26.6
	1~2 hours	24.7	32.0
	2~3 hours	13.5	16.9
	3 hours or more	8.2	12.1

Significant difference was seen in the time spending on watching TV, video and playing video games per day of secondary school students between 2010 and 2005( $P < 0.05$ ). In terms of different genders, female students spending 3 hours or more on watching TV, video and playing video games per day increased significantly. The increase was 26.9% in 2010 from 19.6% in 2005. Students spending less than 30 minutes decreased to 2.8 % from 6.4 % (table 2-2-2-6).

**Table 2-2-2-6 Comparison of time spent on watching TV, video and playing video games in students (%)**

Year	Playing time	Male students	Female students
2005	Less than 30 minutes	4.5	6.4
	30 minutes~1 hour	21.5	20.1
	1~2 hours	28.3	27.1
	2~3 hours	23.5	26.8
	3 hours or more	22.1	19.6
2010	Less than 30 minutes	3.6	2.8
	30 minutes~1 hour	13	13.8
	1~2 hours	26	29.6
	2~3 hours	26	26.9
	3 hours or more	32	26.9

Comparison of the average daily sleeping hours (including nap time) of students showed that significant difference was seen in all age groups ( $P < 0.05$ ). Data analysis showed that the proportion of students sleeping less than 8 hours increased significantly in 2010 which was increased from 39.4 % in 2005 to 48.0%, and the proportion of students sleeping 8~10 hours and more decreased to 50% and 2% in 2010 from 56.3% and 4.2% (table 2-2-2-7).

Table 2-2-2-7 Comparison of sleeping hours in students (%)

Age group	Year	Sleeping hours	Proportion
Primary school	2005	Less than 8 hours	16.5
		8~10 hours	76.7
		10 hours or more	6.7
	2010	Less than 8 hours	19.2
		8~10 hours	77.7
		10 hours or more	3.1
Secondary school	2005	Less than 8 hours	55.3
		8~10 hours	42.3
		10 hours or more	2.4
	2010	Less than 8 hours	66.9
		8~10 hours	31.9
		10 hours or more	1.2
University	2005	Less than 8 hours	68.0
		8~10 hours	30.7
		10 hours or more	1.3
	2010	Less than 8 hours	78.4
		8~10 hours	20.9
		10 hours or more	0.6

Among student subjects, the proportion of students participating in extracurricular activities (hobby classes) and physical exercise decreased., The proportion of participating in hobby classes decreased to 25.3% from 30.1% in 2005.

**2.2.2.2. Physical education at school**

The frequency of attending physical education (PE) classes and exercise intensity of each PE class were examined.

Comparison of weekly PE class attendance of students in the two studies showed that there was significant difference in the primary school sector. The proportion of primary school students who had 2 PE classes per week at school decreased to 50.5% from 58.4% in 2005, and those who had 1 PE class increased to 47.9% from 41%. It was worth noting that among students aged 19~22, the proportion of students who did not attend PE classes increased to 59.5% from 56.6% in 2005.

Proportion of students who were able to reach low exercise intensity during PE classes decreased from 30.3% to 22%, and those who reached high exercise intensity increased to 14.9% from 10.9%. Significant difference was found in primary and secondary schools in the two studies (P<0.05) (table 2-2-2-8).

**Table 2-2-2-8 Comparison of exercise intensity in primary and secondary school students during PE classes (%)**

Age group	Year	Exercise intensity	Percentage
Primary school	2005	Low intensity	34.4
		Moderate intensity	55.1
		High intensity	10.5
	2010	Low intensity	23.1
		Moderate intensity	60.7
		High intensity	16.1
Secondary school	2005	Low intensity	26.4
		Moderate intensity	63.2
		High intensity	10.4
	2010	Low intensity	21.0
		Moderate intensity	65.4
		High intensity	13.7

**2.2.2.3. Extracurricular physical exercise**

In this study, information on extracurricular physical exercise of students was examined. These included frequency, duration, intensity and types of physical exercise.

The results showed that there was significant difference in the frequency of extracurricular physical exercise between the two studies. The proportion of students who never participated in extracurricular physical exercise increased to 35.3% from 28.3 % in 2005, and students participating in extracurricular physical exercise three times or more a week decreased to 13.1% from 15.9%. The proportion of students with low exercise intensity decreased while high exercise intensity increased significantly to 26.1% from 20.2%. However, the proportion of students who participated in physical exercise for less than 30 minutes decreased, and those for 30 minutes~1 hours and 1~2 hours increased, an indication that the concept of time on scientific exercise was better understood.

People who exercised 3 times or more per week, each time for longer than 30 minutes with moderate exercise intensity were defined as “Frequent exerciser”. For those who exercised but could not achieve all three criteria mentioned above at the same time were defined as “occasional exerciser”. Those who did not meet any of the criteria were defined as “non-exerciser”. Physical exercise for students included both PE class and extracurricular physical exercise.

Since the proportion of students who were able to reach moderate and higher exercise intensity during PE classes at school increased in 2010, the proportion of “frequent exercisers” among Macao students increased to 37.5% from 29.8%; however, the proportion of “non-exercisers” increased to 6.5% from 2.9 %.

**2.2.2.4. Occurrence of diseases**

Among student subjects, no significant difference was found in the proportion of students diagnosed

by the hospital to have certain diseases in the past 5 years in primary school students in the two studies, and significant difference was found in secondary school and university students in the two studies ( $P<0.01$ ).

Among the subjects diagnosed with diseases, the proportion of those having accidental injury decreased significantly from 33.4% in 2005 to 14%.

### **2.2.3. Comparison of Anthropometric Measurements**

#### **2.2.3.1. Length indexes**

Through comparison of data (2010 and 2005) in length indexes including height and sitting height, significant difference was found in height, sitting height and foot length. In height, male students were higher than those in the same age group in 2005 in all age groups except in the 14~16 year age groups. Female students were higher than those in the same age group in 2005, of which significant difference was seen in the 7 and 11 year age groups ( $P<0.05$ ). There was significant difference in male students in the 9, 18 and 22 year age groups ( $P<0.05$ ), and no obvious difference was seen in other age groups (table 2-2-2-9).

Sitting height of students before age 13 was significantly higher than that in 2005, and had increased to 73.2 cm in 2010 from 72 cm in 2005 for primary school students. In 2010, female students in the 13, 15 and 22 year age groups were lower than those of the same age group in 2005, and female students in other age groups were higher than those in the same age group in 2005, of which significant difference was found at age 7 ( $P<0.05$ ). Male students in the 14~19 and 21 year age groups in 2010 were lower than those in the same age group in 2005, and those in other age groups were higher than those in the same age group in 2005, of which significant difference was found at the 16, 18 and 22 year age groups ( $P<0.05$ ) (table 2-2-2-10).

Foot length was longer than male students in 2005, and was shorter than female students in 2005 at the 11, 12, 20 and 22 year age groups. For other age groups in females, foot length was longer than that in 2005, and significant difference was found in male students at age 22 and female students at age 11 and 12 ( $P<0.05$ ) (table 2-2-2-11).

Length indexes including height, sitting height and foot length were greater than those in 2005, which indicated that the height, sitting height and foot length had increased in 2010. The decrease of sitting height for secondary school male students was due to the continuous increase in height at this stage, which was in accordance with the law of human body development (develop in the lower limbs first and the upper limbs later).

When the length indexes of the two studies of university, secondary and primary school students were compared, it was found that the range of increase in the indexes tended to be primary school>secondary school>university students.

**Table 2-2-2-9 Comparison of average height in students (cm)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
6 years	118.8	119.6	0.8	117.9	119.3	1.4
7 years	124.1	124.7	0.6	122.8	123.5	0.7*
8 years	128.6	130.9	2.3	127.7	129.9	2.2
9 years	134.4	135.7	1.3*	134.8	136.6	1.8
10 years	140.1	140.2	0.1	140.9	142.9	2.0
11 years	145.8	146.8	1.0	147.7	148.8	1.1*
12 years	152.3	154.9	2.6	152.1	153.8	1.7
13 years	160.7	161.5	0.8	155.6	156.3	0.7
14 years	166.3	166.0	-0.3	156.5	157.8	1.3
15 years	169.0	168.8	-0.2	158.6	159.2	0.6
16 years	170.6	170.5	-0.1	157.9	159.4	1.5
17 years	171.2	171.9	0.7	157.3	159.7	2.4
18 years	171.3	172.0	0.7*	158.5	158.9	0.4
19 years	170.9	171.2	0.3	158.0	158.9	0.9
20 years	171.1	172.1	1.0	157.8	159.1	1.3
21 years	172.3	172.5	0.2	158.1	159.2	1.1
22 years	170.4	172.2	1.8*	157.7	157.8	0.1

Note: difference equaled to data in 2010 minus data in 2005, and the following was the same,\* p<0.05.

**Table 2-2-2-10 Comparison of average sitting height in students (cm)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
6 years	65.1	65.6	0.5	64.4	65.2	0.8
7 years	67.4	67.9	0.5	66.9	66.9	0.0*
8 years	69.0	70.7	1.7	68.8	69.5	0.7
9 years	71.4	72.1	0.7	71.9	72.7	0.8
10 years	73.8	73.9	0.1	74.8	75.5	0.7
11 years	76.3	77.0	0.7	78.1	78.7	0.6
12 years	79.6	80.7	1.1	80.6	81.6	1.0
13 years	83.8	84.2	0.4	83.0	82.9	-0.1
14 years	87.6	87.2	-0.4	83.9	84.1	0.2
15 years	89.6	89.2	-0.4	85.4	85.0	-0.4
16 years	90.9	90.1	-0.8*	85.2	85.4	0.2
17 years	91.4	91.3	-0.1	85.0	85.6	0.6
18 years	91.9	91.2	-0.7*	85.6	85.7	0.1
19 years	91.6	91.5	-0.1	85.4	85.6	0.2
20 years	91.7	92.2	0.5	85.5	85.8	0.3
21 years	92.1	91.7	-0.4	85.6	86.0	0.4
22 years	91.2	92.1	0.9*	86.1	85.2	-0.9

**Table 2-2-2-11 Comparison of average foot length in students (cm)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
6 years	18.3	18.7	0.4	18.1	18.2	0.1
7 years	19.1	19.4	0.3	18.9	18.9	0.0
8 years	19.8	20.3	0.5	19.7	19.9	0.2
9 years	20.8	21.1	0.3	20.6	20.8	0.2
10 years	21.6	21.8	0.2	21.4	21.6	0.2
11 years	22.6	22.8	0.2	22.3	22.2	-0.1*
12 years	23.5	23.9	0.4	22.6	22.5	-0.1*
13 years	24.3	24.6	0.3	22.7	22.7	0.0
14 years	25.0	25.1	0.1	22.7	22.7	0.0
15 years	25.0	25.2	0.2	22.8	22.9	0.1
16 years	25.1	25.3	0.2	22.7	22.8	0.1
17 years	24.9	25.4	0.5	22.7	22.9	0.2
18 years	24.9	25.5	0.6	22.7	22.8	0.1
19 years	24.9	25.2	0.3	22.6	22.6	0.0
20 years	25.0	25.3	0.3	22.6	22.5	-0.1
21 years	25.2	25.3	0.1	22.6	22.6	0.0
22 years	24.9	25.3	0.4*	22.8	22.5	-0.3

**2.2.3.2. Weight and BMI**

Through comparison of the data (2010 and 2005) in weight and BMI, it was found that there was a difference in weight and BMI for primary school students. Weight and BMI were higher than the results in 2005, there was an increase in weight for male and female students in 2010 compared with 2005, of which significant difference was seen in female students in the 6, 8 and 12 year age groups (P<0.05). And there was also significant difference in male students in the 6 and 8 year age groups (P<0.05) (table 2-2-2-12).

BMI of male students in the 10 and 11 year age groups in 2010 was lower than that in 2005, and the BMI in other age groups was higher than 2005. The BMI of female students in all age groups in 2010 was higher 2005, of which there was significant difference in females in the 12 and 14 year age groups (P<0.05), and significant difference was also seen in males in the 8 and 22 year age groups (P<0.05) (table 2-2-2-13).

In the standard weight for height, obesity rate of male students in the 11 year age group in 2010 was lower than that in 2005 while the rate was higher in other age groups. The obesity rate of female students in the 11 and 13 year age groups in 2010 was lower than that in 2005 while the rate was higher in other age groups (table 2-2-2-14).



**Table 2-2-2-12 Comparison of average weight in students (kg)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
6 years	22.0	22.9	0.9*	21.0	22.0	1.0*
7 years	24.3	25.2	0.9	23.6	24.4	0.8
8 years	27.7	30.2	2.5*	26.0	27.9	1.9*
9 years	31.3	32.0	0.7	30.6	32.0	1.4
10 years	35.1	35.2	0.1	34.5	36.6	2.1
11 years	40.5	40.5	0.0	39.6	40.3	0.7
12 years	44.6	46.6	2.0	42.5	45.6	3.1*
13 years	49.0	51.2	2.2	47.0	47.9	0.9
14 years	54.6	55.3	0.7	47.2	50.2	3.0
15 years	56.7	56.8	0.1	49.5	52.1	2.6
16 years	58.1	59.1	1.0	49.2	51.8	2.6
17 years	58.8	60.8	2.0	49.9	52.6	2.7
18 years	59.7	62.0	2.3	49.3	51.6	2.3
19 years	60.7	60.9	0.2	49.2	51.5	2.3
20 years	61.7	63.3	1.6	48.7	51.8	3.1
21 years	62.6	64.7	2.1	48.3	50.8	2.5
22 years	60.9	66.3	5.4	48.6	50.2	1.6

**Table 2-2-2-13 Comparison of average BMI in students**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
6 years	15.5	15.9	0.4	15.1	15.3	0.2
7 years	15.7	16.1	0.4	15.6	15.9	0.3
8 years	16.7	17.4	0.7*	15.8	16.4	0.6
9 years	17.2	17.2	0.0	16.7	17.0	0.3
10 years	17.8	17.7	-0.1	17.2	17.7	0.5
11 years	18.9	18.6	-0.3	18.1	18.1	0.0
12 years	19.1	19.2	0.1	18.3	19.2	0.9*
13 years	18.8	19.5	0.7	19.3	19.6	0.3
14 years	19.7	20.0	0.3	19.2	20.1	0.9*
15 years	19.8	19.9	0.1	19.6	20.6	1.0
16 years	19.9	20.3	0.4	19.7	20.4	0.7
17 years	20.0	20.5	0.5	20.1	20.6	0.5
18 years	20.3	20.9	0.6	19.6	20.4	0.8
19 years	20.8	20.8	0.0	19.7	20.4	0.7
20 years	21.1	21.3	0.2	19.6	20.5	0.9
21 years	21.0	21.8	0.8	19.3	20.1	0.8
22 years	21.0	22.3	1.3*	19.5	20.1	0.6

**Table 2-2-2-14 Comparison of obesity rate in students (%)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
6 years	8.7	17.3	8.6*	5.2	11.7	6.5
7 years	8.1	12.4	4.3	12.7	14.5	1.8
8 years	17.9	25.0	7.1	10.0	17.8	7.8*
9 years	19.2	19.3	0.1	13.3	16.1	2.8
10 years	21.1	22.0	0.9	14.1	17.7	3.6
11 years	15.9	14.8	-1.1	16.6	14.6	-2
12 years	18.1	18.4	0.3	7.6	11.4	3.8
13 years	9.6	10.8	1.2	14.6	11.9	-2.7
14 years	12.1	14.2	2.1	12.6	17.0	4.4
15 years	8.4	11.7	3.3	5.1	12.5	7.4
16 years	8.6	11.1	2.5	4.9	10.7	5.8
17 years	9.0	11.3	2.3	7.2	7.4	0.2
18 years	9.9	14.7	4.8	2.5	5.9	3.4
19 years	9.2	13.7	4.5	4.7	4.7	0
20 years	13.7	19.8	6.1	4.1	8.1	4
21 years	10.1	23.2	13.1*	0.0	3.0	3
22 years	17.1	33.3	16.2*	3.3	7.5	4.2

**2.2.3.3. Circumference indexes**

Comparison of chest circumference in 2010 and 2005 showed that, the chest circumference of male students in the 9~11 year age groups was less than the chest circumference of those in the same age group in 2005, of which significant difference was found in the 8, 15, 16 and 18 year age groups (P<0.05). The chest circumference of female students in the 8, 14~16 and 18~22 year age groups was greater than that in 2005 but less than that in 2005 in other age groups, of which significant difference was found in the 6 and 8 year age groups (P<0.05) (table 2-2-2-15).

**Table 2-2-2-15 Comparison of average chest circumference in students (cm)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
6 years	57.8	58.4	0.6	56.5	56.2	-0.3*
7 years	59.6	59.8	0.2	59.2	58.4	-0.8
8 years	62.8	64.4	1.6*	61	61.5	0.5*
9 years	65.7	65.3	-0.4	65.1	64.8	-0.3
10 years	68.3	67.4	-0.9	68.1	68.4	0.3
11 years	71.9	71.0	-0.9	72.1	70.9	-1.2
12 years	74.1	74.9	0.8	74.9	74.4	-0.5
13 years	75.9	77.7	1.8	77.7	75.8	-1.9
14 years	79.6	80.9	1.3	77.5	78.1	0.6
15 years	80.8	81.6	0.8*	79.0	79.4	0.4
16 years	82.4	83.0	0.6*	79.1	79.5	0.4
17 years	83.3	84.9	1.6	80.2	79.9	-0.3
18 years	83.8	86.2	2.4*	79.3	79.8	0.5
19 years	85.5	85.8	0.3	78.8	80.6	1.8
20 years	86.3	87.8	1.5	79.2	80.2	1.0
21 years	85.6	88.2	2.6	78.2	80.0	1.8
22 years	86.8	89.6	2.8	79.6	79.8	0.2

Waist circumference in 2010 was less than that in 2005 for both male and female students in the 11 year age group, greater than that in 2005 in other age groups, of which significant difference was seen in the waist circumference in the 6 and 8 year age groups of male students and in the 8, 12 and 18 year age groups of female students (P<0.05) (table 2-2-2-16).

**Table 2-2-2-16 Comparison of average waist circumference in students (cm)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
6 years	53.4	54.3	0.9*	51.5	52.4	0.9
7 years	55.1	56.1	1.0	54.0	54.3	0.3
8 years	58.8	60.7	1.9*	55.5	56.5	1.0*
9 years	61.2	61.8	0.6	58.7	59.7	1.0
10 years	63.3	64.4	1.1	60.5	62.3	1.8
11 years	67.6	66.8	-0.8	63.8	63.2	-0.6
12 years	68.1	69.4	1.3	64.3	66.3	2.0*
13 years	67.6	70.0	2.4	65.8	66.8	1.0
14 years	69.8	71.9	2.1	65.5	68.7	3.2
15 years	69.7	71.1	1.4	67.1	69.6	2.5
16 years	70.8	72.9	2.1	66.4	70.1	3.7
17 years	71.4	73.8	2.4	67.5	70.1	2.6
18 years	72.1	75.1	3.0	66.3	69.7	3.4*
19 years	73.8	74.1	0.3	66.1	69.6	3.5
20 years	74.0	76.3	2.3	66.0	70.2	4.2
21 years	73.2	77.0	3.8	65.0	69.9	4.9
22 years	74.9	80.0	5.1	65.6	69.9	4.3

The hip circumference was greater in 2010 than that in 2005 for both male and female students, of which there was significant difference in the hip circumference of male students in the 6 and 22 year age groups and female students in the 6, 8 and 21 year age groups ( $P<0.05$ ) (table 2-2-2-17).

**Table 2-2-2-17 Comparison of average hip circumference in students (cm)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
6 years	60.8	61.2	0.4*	60.2	61.5	1.3*
7 years	63.2	64.1	0.9	63.2	63.9	0.7
8 years	67.0	69.7	2.7	65.6	66.8	1.2*
9 years	69.8	71.2	1.4	70.0	70.8	0.8
10 years	72.9	74.0	1.1	73.3	75.0	1.7
11 years	77.1	77.6	0.5	78.4	78.4	0.0
12 years	79.5	81.8	2.3	81.7	83.2	1.5
13 years	81.6	84.0	2.4	85.3	85.4	0.1
14 years	85.2	87.1	1.9	85.6	87.3	1.7
15 years	86.1	87.7	1.6	87.8	89.2	1.4
16 years	87.3	89.3	2.0	87.8	89.3	1.5
17 years	87.6	91.1	3.5	88.6	90.0	1.4
18 years	88.6	91.2	2.6	87.9	89.1	1.2
19 years	88.4	90.0	1.6	87.7	89.0	1.3
20 years	89.1	90.4	1.3	86.9	89.8	2.9
21 years	88.2	91.3	3.1	86.7	89.7	3.0*
22 years	88.2	92.8	4.6*	86.8	88.5	1.7

The WHR of male students in 2010 was lower than that in 2005 in the 8, 9, 11, 12, 17 and 19 year age groups, higher than that in 2005 in other age groups, of which there was significant difference in the 9, 12, 17, 19, 20 and 21 year age groups ( $P<0.05$ ). The WHR of female students in 2010 was lower than that in 2005 in the 7, 8, 10 and 11 year age groups, and higher than that in 2005 in other age groups, of which significant difference was found in the 12, 13, 16, 18 and 22 year age groups ( $P<0.05$ ) (table 2-2-2-18).

Table 2-2-2-18 Comparison of average WHR in students

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
6 years	0.878	0.888	0.010	0.852	0.853	0.001
7 years	0.871	0.874	0.003	0.853	0.848	-0.005
8 years	0.876	0.868	-0.008	0.846	0.844	-0.002
9 years	0.874	0.866	-0.008*	0.836	0.841	0.005
10 years	0.866	0.868	0.002	0.846	0.828	-0.018
11 years	0.873	0.858	-0.015	0.812	0.805	-0.007
12 years	0.870	0.845	-0.025*	0.786	0.795	0.009*
13 years	0.826	0.832	0.006	0.771	0.780	0.009*
14 years	0.816	0.822	0.006	0.765	0.786	0.021
15 years	0.808	0.809	0.001	0.764	0.779	0.015
16 years	0.809	0.814	0.005	0.755	0.784	0.029*
17 years	0.813	0.811	-0.002*	0.761	0.777	0.016
18 years	0.813	0.825	0.012	0.753	0.781	0.028*
19 years	0.834	0.821	-0.013*	0.753	0.782	0.029
20 years	0.829	0.843	0.014*	0.759	0.781	0.022
21 years	0.829	0.843	0.014*	0.749	0.780	0.031
22 years	0.847	0.862	0.015	0.755	0.789	0.034*

In regards to the three circumference indexes, chest circumference of female students in 2010 was lower than 2005 in the primary and secondary school period. For the other two indexes, both were higher in 2010 than that in 2005, which indicated that there was an increase in the three circumferences of Macao students in 2010 compared with the circumferences in 2005.

Comparison on the 2010 and 2005 circumference indexes of university, secondary and primary school students, it was found that the range of increase appeared to be: primary school>secondary school>university students. The range of increase in weight and the three circumferences indexes appeared to be: university >secondary school>primary school, which was in accordance with human body development, “tendency of primary longitudinal growth vs. transverse growth”.

**2.2.3.4. Width indexes**

Analysis of shoulder and pelvis width in 2010 and 2005 showed that the shoulder width of male students in all age groups in 2010 was less than that in 2005, of which significant difference was found in the 8, 9, 15, 16 and 22 year age groups. For female students, the shoulder width in the 20 and 22 year age groups in 2010 was less than that in 2005, and greater than that in 2005 in other age groups, of which significant difference was found in the 20 year age group (P<0.05) (table 2-2-2-19).

Pelvis width of male students in the 8 and 12 year age groups in 2010 was greater than that in 2005, and was less than that in 2005 in other age groups, of which significant difference was found in all age groups except in the 7, 10, 12~15, 17 and 19~21 year age groups (P<0.05). Pelvis width of female students was greater than that in 2005, of which significant difference was found in the 11 and 12 year age groups (P<0.05) (table 2-2-2-20).

**Table 2-2-2-19 Comparison of average shoulder width in students (cm)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
6 years	26.1	25.7	-0.4	25.3	25.7	0.4
7 years	26.9	26.4	-0.5	26.3	26.7	0.4
8 years	27.9	27.6	-0.3*	27.3	28.2	0.9
9 years	29.2	28.4	-0.8*	28.8	29.5	0.7
10 years	30.4	29.6	-0.8	29.8	30.5	0.7
11 years	31.7	31.1	-0.6	31.5	31.7	0.2
12 years	33.1	33.0	-0.1	32.5	33.2	0.7
13 years	35.0	34.5	-0.5	33.4	33.8	0.4
14 years	36.7	35.7	-1.0	33.6	34.3	0.7
15 years	37.5	36.6	-0.9*	34.0	34.5	0.5
16 years	38.1	37.1	-1.0*	34.2	34.7	0.5
17 years	38.4	37.5	-0.9	34.1	34.8	0.7
18 years	38.8	38.2	-0.6	34.3	34.5	0.2
19 years	39.0	37.9	-1.1	34.5	34.5	0.0
20 years	39.3	38.8	-0.5	34.5	34.4	-0.1*
21 years	39.5	37.9	-1.6	34.7	34.8	0.1
22 years	39.4	38.8	-0.6*	34.7	34.4	-0.3

**Table 2-2-2-20 Comparison of average pelvis width in students (cm)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
6 years	18.7	18.5	-0.2*	18.0	18.7	0.7
7 years	19.3	19.0	-0.3	18.9	19.3	0.4
8 years	19.9	20.2	0.3*	19.3	20.3	1.0
9 years	20.9	20.6	-0.3*	20.6	21.5	0.9
10 years	21.8	21.4	-0.4	21.7	22.2	0.5
11 years	22.8	22.6	-0.2*	22.8	23.0	0.2*
12 years	23.7	23.9	0.2	23.9	24.6	0.7*
13 years	24.8	24.7	-0.1	24.9	25.4	0.5
14 years	25.8	25.5	-0.3	25.2	25.7	0.5
15 years	26.3	25.8	-0.5	25.6	26.1	0.5
16 years	26.4	26.2	-0.2*	25.6	26.3	0.7
17 years	26.7	26.3	-0.4	25.8	26.5	0.7
18 years	26.8	26.5	-0.3*	25.8	26.0	0.2
19 years	27.1	26.4	-0.7	25.6	26.2	0.6
20 years	27.1	26.3	-0.8	25.6	26.2	0.6
21 years	27.4	26.2	-1.2	25.6	26.5	0.9
22 years	27.5	26.7	-0.8*	25.8	26.3	0.5

Analysis of width indexes indicated that the shoulder and pelvis width in 2010 was less than that in 2005 for male students, and was greater in 2010 than that in 2005 for female students. The range of increase for male students in each age group in 2010 was: primary school<secondary school<university. Shoulder width of female students increased in the primary and secondary school period and decreased in university period, and pelvis width of female students in 2010 was greater than that in 2005.

**2.2.3.5. Body composition**

Comparison of the 2010 and 2005 upper arm skinfold thickness showed that the upper arm skinfold thickness of male students in 2010 was less than that in 2005, of which significant difference was found in the 6 and 17 year age groups (P<0.05). Upper arm skinfold thickness of female students in 2010 was greater than that in 2005, and significant difference was found in the 6~18 and 22 year age groups (P<0.05) (table 2-2-2-21).

**Table 2-2-2-21 Comparison of average upper arm skinfold thickness in students (mm)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
6 years	9.5	8.1	-1.4*	9.9	10.1	0.2*
7 years	10.1	8.3	-1.8	10.9	11.0	0.1*
8 years	12.4	11.1	-1.3	12.0	12.4	0.4*
9 years	13.4	10.7	-2.7	13.4	13.9	0.5*
10 years	13.9	12.2	-1.7	14.0	14.5	0.5*
11 years	15.4	13.2	-2.2	13.9	14.0	0.1*
12 years	14.2	13.1	-1.1	14.7	16.0	1.3*
13 years	11.9	10.2	-1.7	16.1	17.9	1.8*
14 years	11.8	9.2	-2.6	16.4	17.8	1.4*
15 years	11.3	8.2	-3.1	16.7	20.8	4.1*
16 years	11.0	8.3	-2.7	16.7	20.6	3.9*
17 years	10.8	9.7	-1.1*	17.4	20.2	2.8*
18 years	11.0	8.9	-2.1	17.4	19.3	1.9*
19 years	10.9	8.8	-2.1	16.6	18.4	1.8
20 years	11.7	9.7	-2.0	16.1	19.0	2.9
21 years	10.7	8.5	-2.2	16.0	18.8	2.8
22 years	11.3	10.5	-0.8	15.8	18.5	2.7*

Subscapular skinfold thickness of male students was greater in the 22 year age group in 2010 than that in 2005, and less than that in 2005 in other age groups, of which significant difference was found in the 6, 8, 14 and 22 year age groups (P<0.05). For female students, subscapular skinfold thickness was less in all age group in 2010 than that in 2005, of which significant difference was found in the 6, 9, 11 and 19 year age groups (P<0.05) (table 2-2-2-22).

**Table 2-2-2-22 Comparison of average subscapular skinfold thickness in students (mm)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
6 years	6.5	5.1	-1.4*	7.3	5.9	-1.4*
7 years	7.3	4.7	-2.6	8.7	5.9	-2.8
8 years	9.9	8.0	-1.9*	9.2	7.2	-2.0
9 years	10.9	7.7	-3.2	11.5	9.6	-1.9*
10 years	11.5	9.0	-2.5	12.2	9.9	-2.3
11 years	13.5	10.3	-3.2	13.1	10.4	-2.7*
12 years	13.1	11.8	-1.3	13.6	11.8	-1.8
13 years	11.4	9.9	-1.5	15.4	12.5	-2.9
14 years	11.5	9.7	-1.8*	16.3	13.1	-3.2
15 years	11.5	8.5	-3.0	16.2	15.5	-0.7
16 years	11.7	9.3	-2.4	16.5	15.5	-1.0
17 years	11.8	10.8	-1.0	17.3	14.7	-2.6
18 years	12.2	10.7	-1.5	16.9	14.1	-2.8
19 years	13.2	11.3	-1.9	17.6	13.8	-3.8*
20 years	14.2	12.1	-2.1	17.4	13.1	-4.3
21 years	12.8	11.7	-1.1	17.6	13.8	-3.8
22 years	12.8	14.5	1.7*	18.2	13.6	-4.6

Abdominal skinfold thickness of male students in 2010 was greater than that in 2005 in the 19~22 year age groups, and was less in 2010 in other age groups, of which significant difference was found in the 6 year age group ( $P<0.05$ ). Abdominal skinfold thickness of female students in 2010 was greater than that in 2005 in the 6 and 19~22 year age groups and less than that in 2005 in other age groups, of which significant difference was found in the 6, 8, 10 and 18 year age groups ( $P<0.05$ ) (table 2-2-2-23).



**Table 2-2-2-23 Comparison of average abdominal skinfold thickness in students (mm)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
6 years	7.8	6.7	-1.1*	8.1	8.6	0.5*
7 years	8.9	6.5	-2.4	10.1	9.1	-1.0
8 years	12.7	11.1	-1.6	11.6	10.9	-0.7*
9 years	13.7	11.3	-2.4	14.6	13.5	-1.1
10 years	15.1	12.9	-2.2	15.9	15.6	-0.3*
11 years	18.0	15.7	-2.3	17.0	15.9	-1.1
12 years	16.7	17.4	0.7	18.9	18.5	-0.4
13 years	14.8	13.6	-1.2	21.7	19.7	-2.0
14 years	14.8	12.8	-2.0	21.0	20.0	-1.0
15 years	14.0	11.1	-2.9	22.9	22.5	-0.4
16 years	14.1	11.9	-2.2	22.3	22.1	-0.2
17 years	14.4	13.8	-0.6	22.9	21.7	-1.2
18 years	14.4	13.7	-0.7	21.6	20.6	-1.0*
19 years	14.9	15.0	0.1	20.1	20.3	0.2
20 years	15.6	16.4	0.8	19.1	21.7	2.6
21 years	13.6	15.8	2.2	18.6	21.2	2.6
22 years	15.1	18.3	3.2	19.2	20.9	1.7

In regards to body composition, upper arm skinfold thickness of students in 2010 was compared with 2005. It was shown that a decrease was found in all age groups for male students while it showed an increase among female students, with the range of increase: primary school>secondary school>university. Subscapular skinfold thickness in 2005 was greater than that in 2010 in all age groups. Abdominal skinfold thickness in 2005 was greater than that in 2010 in the primary school and secondary school students, and greater in 2010 than 2005 in university students. This showed that in body composition, the upper arm and subscapular fat content of students in 2005 was higher than that in 2010; the abdominal fat content was higher in 2010 than that in 2005 in university students, whereas it was higher in 2005 than that in 2010 in the primary school and secondary school students.

Body fat percentage of male students in 2010 was lower than that in 2005 in all age groups except in the 9~14 and 22 year age groups, and body fat percentage of female students was higher in 2010 than 2005 in all age groups except in university students. For most age groups, the lean body mass in 2010 was higher than that in 2005 (table 2-2-2-24 and 2-2-2-25).

**Table 2-2-2-24 Comparison of average body fat percentage in students (%)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
9 years	15.7	17.8	2.1	18.4	22.9	4.5
10 years	16.3	19.3	3.0	19.1	23.6	4.5
11 years	18.0	20.3	2.3	19.6	23.3	3.7
12 years	17.2	19.5	2.3	20.2	22.7	2.5
13 years	15.3	17.0	1.7	22.1	24.4	2.3
14 years	15.3	16.3	1.0	22.7	24.7	2.0
15 years	15.1	11.8	-3.3	22.8	27.5	4.7
16 years	15.0	12.2	-2.8	23.0	27.4	4.4
17 years	14.9	14.0	-0.9	23.8	26.6	2.8
18 years	15.2	13.4	-1.8	23.5	25.5	2.0
19 years	15.6	13.9	-1.7	23.5	22.4	-1.1
20 years	16.5	14.6	-1.9	23.1	22.4	-0.7
21 years	15.4	13.8	-1.6	23.2	22.6	-0.6
22 years	15.7	16.0	0.3	23.4	22.3	-1.1

**Table 2-2-2-25 Comparison of average lean body mass in students (kg)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
9 years	26.0	26.1	0.1	24.6	24.2	-0.4
10 years	29.0	28.1	-0.9	27.5	27.5	0.0
11 years	32.6	31.6	-1.0	31.4	30.3	-1.1
12 years	36.2	36.5	0.3	33.5	34.6	1.1
13 years	41.0	41.9	0.9	36.0	35.6	-0.4
14 years	45.7	45.8	0.1	36.0	37.2	1.2
15 years	47.7	49.6	1.9	37.9	37.2	-0.7
16 years	49.0	51.3	2.3	37.5	37.1	-0.4
17 years	49.5	51.8	2.3	37.6	38.0	0.4
18 years	50.2	53.2	3.0	37.4	37.9	0.5
19 years	50.6	52.2	1.6	37.3	39.7	2.4
20 years	51.1	53.5	2.4	37.0	39.8	2.8
21 years	52.7	55.5	2.8	36.9	39.1	2.2
22 years	50.9	55.4	4.5	36.9	38.6	1.7

**2.2.4. Comparison of Physiological Function**

Physiological function is reflected by resting pulse, blood pressure (systolic pressure and diastolic pressure) and vital capacity.

**2.2.4.1. Resting pulse**

Resting pulse is a simple index used to reflect the functions of the circulatory system. Comparison of the resting pulse in 2010 with 2005 found that the resting pulse of male students was higher or equal to the resting pulse in 2005 in the 18 and 22 year age groups, of which no significant difference was found in the 9, 14, 17, 18 and 20~22 year age groups, and there was significant difference in other age groups ( $P<0.05$ ). Resting pulse of female students in 2010 was lower than 2005, of which no significant difference was found in 7, 15, 18 and 22 year age groups, and there was significant difference in other age groups ( $P<0.05$ ) (table 2-2-2-26).

**Table 2-2-2-26 Comparison of average resting pulse in students (times/minute)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
6 years	92.7	88.3	-4.4*	93.1	87.9	-5.2*
7 years	90.5	85.9	-4.6*	93.3	86.9	-6.4
8 years	90.9	86.5	-4.4*	90.7	86.4	-4.3*
9 years	90.9	85.0	-5.9	91.4	85.0	-6.4*
10 years	88.2	83.0	-5.2*	90.4	84.9	-5.5*
11 years	89.4	82.7	-6.7*	90.4	84.2	-6.2*
12 years	89.7	83.6	-6.1*	89.4	83.8	-5.6*
13 years	86.7	82.0	-4.7*	87.4	81.8	-5.6*
14 years	84.7	82.9	-1.8	86.8	81.7	-5.1*
15 years	86.1	81.3	-4.8*	84.6	83.6	-1.0
16 years	81.9	78.4	-3.5*	83.8	81.4	-2.4*
17 years	81.2	79.1	-2.1	83.5	79.4	-4.1*
18 years	79.4	79.4	0.0	81.4	78.8	-2.6
19 years	81.9	77.7	-4.2*	82.9	77.1	-5.8*
20 years	78.3	75.2	-3.1	83.2	77.7	-5.5*
21 years	76.6	74.8	-1.8	83.2	76.4	-6.8*
22 years	75.4	77.2	1.8	79.8	76.1	-3.7

**2.2.4.2. Blood pressure**

When the ventricle contracts, the blood pressure of artery rises and the highest value is called systolic pressure, which reflects mainly the quantity of blood pumped out by each pulse. When the ventricle relaxes, the blood pressure of artery descends and the lowest value is called diastolic pressure, which reflects mainly the outside resistance. The difference between systolic and diastolic pressures is called pressure difference, which reflects the elasticity of the artery wall.

Comparison of the blood pressure in 2010 and 2005 showed that systolic pressure and diastolic pressure in 2010 were higher than the results in 2005 for both male and female students, of which significant difference was found in the 9, 13~15 and 18~21 year age groups of male students and in the 10, 11, 13, 16, 18 and 21 year age groups of female students ( $P<0.05$ ). In terms of school age groups, there was significant difference in the systolic pressure in primary school, secondary school and university age

groups, and in the diastolic pressure in primary school and secondary school age groups ( $P<0.05$ ) (table 2-2-2-27).

**Table 2-2-2-27 Comparison of average systolic pressure in students (mmHg)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
6 years	89.8	92.2	2.4	86.5	89.9	3.4
7 years	90.9	94.8	3.9	88.1	94.2	6.1
8 years	91.6	100.7	9.1	89.9	96.3	6.4
9 years	96.1	103.0	6.9*	95.5	102.3	6.8
10 years	99.4	104.8	5.4	100.1	104.4	4.3*
11 years	102.9	105.9	3	101.3	104.9	3.6*
12 years	105.6	109.5	3.9	104.8	107.9	3.1
13 years	110.2	113.5	3.3*	106.4	110.0	3.6*
14 years	112.0	115.4	3.4*	105.2	111.0	5.8
15 years	114.9	116.0	1.1*	106.6	110.6	4.0
16 years	114.2	118.1	3.9	107.5	110.8	3.3
17 years	115.7	119.7	4.0	105.8	111.4	5.6
18 years	115.2	118.2	3.0*	104.0	110.5	6.5*
19 years	116.6	117.7	1.1*	103.0	110.1	7.1
20 years	116.5	118.3	1.8*	102.8	111.1	8.3
21 years	112.6	118.9	6.3*	100.3	109.5	9.2*
22 years	113.7	124.6	10.9	103.0	108.8	5.8

Significant difference was seen in the diastolic pressure of male students in the 8, 13, 15 and 16 age groups and females in the 10, 16~18, 21 and 22 age groups ( $P<0.05$ ) (table 2-2-2-28).

**Table 2-2-2-28 Comparison of average diastolic pressure in students (mmHg)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
6 years	55.2	57.4	2.2	54.2	57.3	3.1
7 years	55.2	58.9	3.7	54.8	58.8	4.0
8 years	55.8	60.5	4.7*	54.9	58.6	3.7
9 years	59.1	63.4	4.3	58.9	62.9	4.0
10 years	59.9	64.8	4.9	60.5	64.0	3.5*
11 years	62.9	64.9	2.0	62.8	65.5	2.7
12 years	62.9	67.3	4.4	66.1	67.5	1.4
13 years	65.1	68.8	3.7*	66.8	68.7	1.9
14 years	67.5	71.2	3.7	66.4	69.5	3.1
15 years	68.1	70.7	2.6*	67.2	69.9	2.7
16 years	68.9	72.0	3.1*	67.6	69.8	2.2*
17 years	69.7	73.9	4.2	68.8	70.9	2.1*
18 years	70.3	73.2	2.9	67.5	70.2	2.7*
19 years	70.4	72.5	2.1	68.1	69.1	1.0
20 years	72.1	75.0	2.9	65.8	70.1	4.3
21 years	69.7	74.9	5.2	64.8	69.1	4.3*
22 years	71.5	78.4	6.9	65.8	68.2	2.4*

Pressure difference of male students in 2010 was lower than 2005 in the 12~15, 17, 19 and 20 year age groups, and higher in 2010 than 2005 in other age groups, of which significant difference was found in the 7~10, 12~20 and 22 year age groups ( $P<0.05$ ). Pressure difference of female students in 2010 was higher than 2005 in all age groups, of which significant difference was found in the 6, 8, 10, 11 and 13~16 year age groups ( $P<0.05$ ). In terms of age groups in primary school, secondary school and university, significant difference in the pressure difference was found in both studies ( $P<0.05$ ) (table 2-2-2-29).

**Table 2-2-2-29 Comparison of average pressure difference in students (mmHg)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
6 years	34.6	34.8	0.2	32.3	32.6	0.3*
7 years	35.9	35.9	0.0	33.3	35.4	2.1
8 years	35.7	40.1	4.4*	35.0	37.7	2.7*
9 years	37.0	39.6	2.6*	36.6	39.4	2.8
10 years	39.5	40.0	0.5*	39.7	40.5	0.8*
11 years	40.0	41.0	1.0	38.5	39.5	1.0*
12 years	42.6	42.2	-0.4*	38.8	40.4	1.6
13 years	45.1	44.7	-0.4*	39.6	41.3	1.7*
14 years	44.4	44.1	-0.3*	38.8	41.4	2.6*
15 years	46.9	45.3	-1.6*	39.4	40.7	1.3*
16 years	45.2	46.1	0.9*	40.0	40.9	0.9*
17 years	45.9	45.8	-0.1*	37.0	40.4	3.4
18 years	44.9	45.0	0.1*	36.5	40.3	3.8
19 years	46.2	45.2	-1.0*	34.9	41.0	6.1
20 years	44.4	43.3	-1.1*	37.0	41.0	4.0
21 years	42.9	44.1	1.2	35.5	40.5	5.0
22 years	42.2	46.2	4.0*	37.2	40.6	3.4

**2.2.4.3. Vital capacity**

Vital capacity refers to the maximum amount of air that can be exhaled after a maximum inhalation. This indicates the maximum working capacity of the respiratory system of the human body.

Comparison of vital capacity in 2010 and 2005 showed that, vital capacity of male students in 2010 was higher than 2005 in the 12, 14 and 17 year age groups, and lower in 2010 than 2005 in other age groups, of which significant difference was found in the 6, 8~11, 17, 19 and 20 year age groups ( $P<0.05$ ). Vital capacity of female students in 2010 was higher than 2005 in the 9, 10, 12, 14 and 17 year age groups, and lower in 2010 than 2005 in other age groups, of which the significant difference was seen in the 7, 8, 10~12, 14, 15, 17 and 18 year age groups ( $P<0.05$ ). Through comparison of the vital capacity in different student age groups, significant difference was found in the primary school and university age groups ( $P<0.05$ ) (table 2-2-2-30).

**Table 2-2-2-30 Comparison of average vital capacity in students (ml)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
6 years	1217.3	1068.7	-148.6*	1115.4	987.5	-127.9
7 years	1361.2	1255.3	-105.9	1271.5	1179.0	-92.5*
8 years	1564.0	1517.4	-46.6*	1393.7	1351.0	-42.7*
9 years	1758.7	1741.0	-17.7*	1615.7	1623.5	7.8
10 years	1989.5	1924.8	-64.7*	1815.2	1830.2	15.0*
11 years	2201.8	2162.8	-39.0*	2120.4	2080.8	-39.6*
12 years	2523.3	2586.6	63.3	2286.4	2311.4	25.0*
13 years	2986.0	2969.9	-16.1	2491.6	2448.4	-43.2
14 years	3414.0	3432.2	18.2	2491.8	2624.7	132.9*
15 years	3734.2	3660.0	-74.2	2708.7	2669.6	-39.1*
16 years	3974.9	3793.1	-181.8	2701.9	2635.5	-66.4
17 years	4015.9	4036.0	20.1*	2716.3	2843.6	127.3*
18 years	4016.1	3915.8	-100.3	2795.6	2706.1	-89.5*
19 years	4335.0	3997.0	-338.0*	2793.8	2713.2	-80.6
20 years	4442.3	4147.4	-294.9*	2866.9	2751.7	-115.2
21 years	4303.1	4170.9	-132.2	2958.4	2688.4	-270.0
22 years	4313.6	4131.6	-182.0	2930.2	2636.5	-293.7

Comparison of vital capacity/weight index in 2010 and 2005 showed that the index of female students in 2010 was lower than 2005 in all age groups, of which significant difference was found in the 6, 10~12, 17, 18 and 22 year age groups for male students and in the 6, 9, 10~12 and 17 year age groups for female students (P<0.05). In terms of school age groups, significant difference in the vital capacity/weight index was found in primary and secondary school age groups in the two studies (P<0.01) (table 2-2-2-31).

**Table 2-2-2-31 Comparison of average vital capacity/weight in students (ml/kg)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
6 years	56.3	48.3	-8.0*	53.5	46.2	-7.3*
7 years	57.2	51.1	-6.1	55.1	48.9	-6.2
8 years	58.0	52.0	-6.0	54.7	49.9	-4.8
9 years	58.0	56.1	-1.9	54.1	52.4	-1.7*
10 years	58.3	56.6	-1.7*	54.2	51.6	-2.6*
11 years	56.3	55.4	-0.9*	54.6	52.7	-1.9*
12 years	58.3	57.7	-0.6*	54.7	51.7	-3.0*
13 years	62.2	59.2	-3.0	54.3	51.9	-2.4
14 years	63.7	63.7	0.0	53.7	53.0	-0.7
15 years	67.2	65.4	-1.8	55.4	51.9	-3.5
16 years	69.4	65.5	-3.9	55.6	51.5	-4.1
17 years	69.3	67.4	-1.9*	55.3	54.8	-0.5*
18 years	68.0	64.3	-3.7*	57.4	53.1	-4.3
19 years	72.0	66.3	-5.7	57.4	53.4	-4.0
20 years	72.5	66.9	-5.6	59.4	53.9	-5.5
21 years	71.2	65.4	-5.8	61.7	53.4	-8.3
22 years	71.7	63.1	-8.6*	60.7	53.2	-7.5

**2.2.5. Comparison of Physical Fitness**

**2.2.5.1. Speed**

50-m run was used to reflect the speed of students. Through comparison of the 50-m run results, it was found that the 50-m run results of male students in 2010 were better than 2005 in the 18 year age group, and were worse in other age groups in 2010, of which significant difference was found in each age group except in the 7~9 and 14 year age groups ( $P<0.05$ ). The results of 50-m run of female students in the 16 and 22 year age groups in 2010 were better, and were worse in other age groups in 2010, of which significant difference was found in each age group except in the 10 year age group ( $P<0.05$ ). Comparison of results of students in different age groups showed that there was significant difference in primary and secondary school age group in the two studies ( $P<0.01$ ) (table 2-2-2-32).

**Table 2-2-2-32 Comparison of average time for 50-m run in students (sec)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
6 years	12.3	12.6	0.3*	12.7	13.5	0.8*
7 years	11.5	11.8	0.3	11.9	12.5	0.6*
8 years	10.8	11.2	0.4	11.2	11.6	0.4*
9 years	10.4	10.7	0.3	10.7	11.2	0.5*
10 years	10.0	10.2	0.2*	10.5	10.7	0.2
11 years	9.8	9.9	0.1*	9.9	10.3	0.4*
12 years	9.3	9.5	0.2*	10.0	10.2	0.2*
13 years	8.6	8.8	0.2*	10.1	10.1	0.0*
14 years	8.3	8.6	0.3	10.0	10.0	0.0*
15 years	8.1	8.2	0.1*	9.9	10.0	0.1*
16 years	8.0	8.1	0.1*	9.9	9.7	-0.2*
17 years	7.9	8.0	0.1*	9.8	10.1	0.3*
18 years	8.0	7.8	-0.2*	10.0	10.1	0.1*
19 years	7.8	8.1	0.3*	10.1	10.3	0.2*
20 years	8.0	8.3	0.3*	10.0	10.2	0.2*
21 years	7.8	8.3	0.5*	10.1	10.2	0.1*
22 years	8.3	8.4	0.1*	10.3	10.2	-0.1*

**2.2.5.2. Strength**

Standing long jump, vertical jump, pull-ups (pull-ups with body inclined), one-minute sit-ups, grip strength and back strength were used to reflect the strength of students. Standing long jump and vertical jump reflected mainly explosive force, pull-ups (pull-ups with body inclined) and one-minute sit-ups reflected mainly endurance. Grip strength and back strength reflected the maximum force that can be exerted by muscle. Comparison of the 2005 and 2010 indexes showed that there was significant difference in the indexes between the two studies except the pull-ups (pull-ups with body inclined) indexes ( $P<0.05$ ). Comparison of the indexes according to the school age groups showed that significant difference was seen

in the results of grip strength, vertical jump and back strength in the primary and secondary school age groups ( $P<0.05$ ), and in the results of standing long jump and grip strength in university age groups in the two studies ( $P<0.05$ ).

Comparison of grip strength in 2010 and 2005 data showed that the grip strength of male students in the 21 and 22 year age groups in 2010 was higher than 2005, and was lower in other age groups, of which significant difference was found in the 7, 15 and 20 year age groups ( $P<0.05$ ). The grip strength of female students in 2010 in all age groups was lower than that in 2005, of which there was significant difference in the 12 and 17 year age groups ( $P<0.05$ ) (table 2-2-2-33).

**Table 2-2-2-33 Comparison of average grip strength in students (kg)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
6 years	8.3	7.7	-0.6	7.2	7.0	-0.2
7 years	10.1	9.3	-0.8*	8.7	8.1	-0.6
8 years	10.9	10.4	-0.5	10.2	9.7	-0.5
9 years	13.5	11.9	-1.6	12.3	11.1	-1.2
10 years	15.0	13.5	-1.5	14.2	13.4	-0.8
11 years	17.1	16.4	-0.7	17.3	15.7	-1.6
12 years	20.9	19.7	-1.2	19.4	17.5	-1.9*
13 years	25.9	24.1	-1.8	21.2	18.7	-2.5
14 years	30.8	27.7	-3.1	21.1	20.0	-1.1
15 years	33.8	30.4	-3.4*	23.2	20.6	-2.6
16 years	36.6	32.9	-3.7	23.1	20.6	-2.5
17 years	37.3	34.7	-2.6	23.7	21.7	-2.0*
18 years	39.5	36.2	-3.3	23.7	21.8	-1.9
19 years	39.1	37.9	-1.2	23.6	22.0	-1.6
20 years	41.1	38.9	-2.2*	23.6	22.1	-1.5
21 years	40.3	42.5	2.2	23.5	22.5	-1.0
22 years	38.9	40.9	2.0	24.0	22.7	-1.3

Comparison of pull-ups or pull-ups with body inclined for male students showed that, results of pull-ups with body inclined in 2010 were higher than 2005, and results of pull-ups in 2010 were lower in the 13, 17, 19 and 22 year age groups, and were higher in 2010 in other age groups, of which there was significant difference in the 6, 7, 11 and 15 year age groups ( $P<0.05$ ). Results of sit-ups of female students in the 6, 7, 11 and 14~18 year age groups in 2010 were lower than t 2005, and significant difference was seen in the 12, 17, and 22 year age groups ( $P<0.05$ ) (table 2-2-2-34).



**Table 2-2-2-34 Comparison of average strength endurance in students\***

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
6 years	10.3	16.8	6.5*	12.0	9.3	-2.7
7 years	13.2	16.7	3.5*	13.9	13.7	-0.2
8 years	12.7	16.2	3.5	15.8	16.9	1.1
9 years	13.7	14.3	0.6	18.6	18.6	0.0
10 years	13.0	17.7	4.7	19.3	20.3	1.0
11 years	12.9	21.3	8.4*	23.8	22.6	-1.2
12 years	12.5	19.5	7.0	23.8	23.9	0.1*
13 years	1.2	0.8	-0.4	24.0	24.3	0.3
14 years	0.9	1.1	0.2	25.2	25.1	-0.1
15 years	1.5	1.6	0.1*	26.0	25.2	-0.8
16 years	2.0	2.0	0.0	25.7	25.6	-0.1
17 years	2.6	2.2	-0.4	25.1	23.4	-1.7*
18 years	2.6	2.9	0.3	24.3	23.7	-0.6
19 years	3.1	2.7	-0.4	24.1	24.7	0.6
20 years	2.8	2.8	0.0	22.7	25.4	2.7
21 years	2.9	3.0	0.1	23.0	23.8	0.8
22 years	3.1	2.5	-0.6	20.5	21.9	1.4*

Note: strength endurance of students\*: pull-ups with body inclined were used for male students between age 6-12 (times), and pull-ups were used for male students between age 13-22 (times), while one-minute sit-ups were used for female students (times/minute).

Back strength was lower in 2010 than 2005 for both male and female students, of which significant difference was found in male students at age 20 and female students at age 7 (P<0.05) (table 2-2-2-35).

**Table 2-2-2-35 Comparison of average back strength in students (kg)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
6 years	27.2	24.0	-3.2	24.5	19.7	-4.8
7 years	30.4	27.4	-3.0	26.7	22.2	-4.5*
8 years	34.7	30.7	-4.0	32.0	25.9	-6.1
9 years	42.0	34.3	-7.7	37.2	30.7	-6.5
10 years	43.7	38.6	-5.1	40.0	33.1	-6.9
11 years	52.1	44.9	-7.2	46.8	38.5	-8.3
12 years	60.9	52.6	-8.3	48.2	41.4	-6.8
13 years	72.2	64.5	-7.7	52.4	44.9	-7.5
14 years	84.9	74.5	-10.4	54.6	47.2	-7.4
15 years	92.9	79.9	-13.0	58.0	47.9	-10.1
16 years	102.1	86.7	-15.4	59.1	49.0	-10.1
17 years	103.8	91.9	-11.9	59.7	50.7	-9.0
18 years	109.8	95.5	-14.3	59.7	50.7	-9.0
19 years	111.9	98.5	-13.4	63.5	53.6	-9.9
20 years	116.0	100.3	-15.7*	64.3	50.9	-13.4
21 years	116.3	108.9	-7.4	64.3	53.9	-10.4
22 years	116.2	104.8	-11.4	66.1	55.7	-10.4

Results of standing long jump of male students in 2010 were higher than 2005 in the 6, 8, 10, 11, 14 and 20 year age groups, and lower in 2010 in other age groups, of which significant difference was seen in the 8, 13, 14 and 21 year age groups ( $P<0.05$ ). Results of female students in 2010 were higher than 2005 in the 7, 9, 10 14 and 21 year age groups, and lower in 2010 in other age groups, of which significant difference was seen in the 9 and 14 year age groups ( $P<0.05$ ) (table 2-2-2-36).

**Table 2-2-2-36 Comparison of average standing long jump in students (cm)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
6 years	101.8	105.5	3.7	95.3	92.0	-3.3
7 years	113.7	112.0	-1.7	102.1	102.2	0.1
8 years	120.9	121.9	1.0*	114.3	112.9	-1.4
9 years	132.2	129.5	-2.7	119.9	121.3	1.4*
10 years	133.4	137.2	3.8	126.0	127.7	1.7
11 years	141.5	147.0	5.5	133.0	130.5	-2.5
12 years	154.3	152.4	-1.9	134.2	130.4	-3.8
13 years	169.4	166.6	-2.8*	133.7	131.9	-1.8
14 years	178.0	178.1	0.1*	135.6	136.5	0.9*
15 years	195.2	184.9	-10.3	144.1	136.0	-8.1
16 years	201.0	193.2	-7.8	140.1	137.4	-2.7
17 years	209.6	198.0	-11.6	145.9	135.5	-10.4
18 years	205.9	201.3	-4.6	142.8	137.1	-5.7
19 years	206.9	203.7	-3.2	145.7	139.4	-6.3
20 years	205.3	207.6	2.3	152.5	139.4	-13.1
21 years	205.4	202.0	-3.4*	144.5	145.1	0.6
22 years	213.5	197.5	-16.0	153.4	141.3	-12.1

Results of vertical jump of male students in 2010 were higher than 2005 in the 7~14 and 17~20 year age groups, of which there was significant difference in the 8, 11, 13 and 16 year age groups ( $P<0.05$ ). Results of vertical jump of female students in 2010 were higher than the 2005 in the 7~10, 13~19 and 21 year age groups, and lower in 2010 than 2005 in other age groups, of which there was significant difference in the 9, 10, 14~16, 18 and 22 year age groups ( $P<0.05$ ) (table 2-2-2-37).

**Table 2-2-2-37 Comparison of average vertical jump in students (cm)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
6 years	19.6	19.3	-0.3	18.9	16.9	-2.0
7 years	20.9	21.1	0.2	19.3	19.5	0.2
8 years	22.2	22.7	0.5*	21.2	21.7	0.5
9 years	24.3	24.3	0.0	21.3	22.7	1.4*
10 years	24.6	25.9	1.3	22.7	24.0	1.3*
11 years	26.9	27.4	0.5*	25.4	24.4	-1.0
12 years	29.0	29.0	0.0	25.4	24.1	-1.3
13 years	33.2	33.6	0.4*	24.1	25.0	0.9
14 years	35.5	35.9	0.4	23.6	26.1	2.5*
15 years	38.8	37.9	-0.9	24.9	25.8	0.9*
16 years	39.8	39.6	-0.2*	25.3	26.0	0.7*
17 years	40.6	41.7	1.1	25.4	25.4	0.0
18 years	41.2	42.5	1.3	24.7	25.5	0.8*
19 years	41.9	42.1	0.2	25.1	25.8	0.7
20 years	41.6	42.2	0.6	25.8	25.0	-0.8
21 years	42.0	40.3	-1.7	25.3	25.5	0.2
22 years	42.9	40.9	-2.0	25.1	24.3	-0.8*

**2.2.5.3. Endurance run**

Endurance of students aged 6~12 was reflected by the 50 m X 8 run back and forth, the endurance of male students aged 13~22 was reflected by 1000-m run and the endurance of female students aged 13~22 was reflected by 800-m run. Comparison and analysis of the endurance run data in 2010 and 2005 showed that, the results of 50 m X 8 run back and forth in 2010 were lower than 2005 for both male and female students. The results of 1000-m run for male students were lower in 2010 than 2005, and the results of 800-m run for female students were higher in 2010 in the 14, 19 and 22 year age groups, and lower in 2010 than 2005 in other age groups. Significant difference was found in all age groups for male and female students except in the 7~9, 11 and 13 year age groups for male students and in the 14 year age group for female students. According to the two studies, it was found that there was significant difference in the secondary age groups, as shown by the results of endurance run for students in the secondary age groups in 2010, where the time to finish the run were significantly longer than the results in 2005 (table 2-2-2-38).

**Table 2-2-2-38 Comparison of average time of endurance run in students\* (sec)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
6 years	151.3	152.8	1.5 *	153.4	159.2	5.8 *
7 years	145.6	147.3	1.7	146.0	152.1	6.1*
8 years	138.3	146.6	8.3	141.4	147.3	5.9*
9 years	130.5	138.5	8.0	134.4	142.9	8.5*
10 years	125.8	131.9	6.1 *	128.8	136.1	7.3*
11 years	124.4	127.4	3.0	119.8	128.3	8.5*
12 years	116.7	119.2	2.5*	128.7	129.1	0.4*
13 years	301.4	333.1	31.7	284.8	295.0	10.2*
14 years	296.6	316.0	19.4 *	282.4	281.3	-1.1
15 years	281.7	298.2	16.5*	276.6	283.7	7.1*
16 years	275.5	289.8	14.3*	272.7	280.6	7.9*
17 years	276.1	294.0	17.9*	274.5	285.3	10.8*
18 years	274.5	288.5	14.0*	285.5	288.2	2.7 *
19 years	271.7	293.6	21.9*	289.3	286.7	-2.6*
20 years	280.4	286.6	6.2*	287.9	288.7	0.8*
21 years	276.9	296.0	19.1*	282.8	287.4	4.6*
22 years	280.7	311.2	30.5*	289.6	284.9	-4.7*

Note: endurance run of students\*: 50 m X 8 run back and forth was used for students aged 6-12. 1000-m run was used for male students and 800-m run was used for female students aged 13-22.

**2.2.5.4. Flexibility**

Sit and reach was used to reflect flexibility. Comparison and analysis of the 2010 and 2005 results on sit and reach showed that, the results in 2010 were lower than 2005 in the 9, 12, 15, 16 and 19~21 year age groups of male students, of which there was significant difference in the 8~10 year age group (P<0.05). For female students, the results in 2010 were lower than 2005 in the 8~11, 16 and 22 year age groups, of which there was significant difference in the 16 year age group (P<0.05). Comparison according to school age groups showed that significant difference was seen in the primary school age groups in the two studies (P<0.05), as shown by the results in 2010 were better than in 2005 (table 2-2-2-39).

**Table 2-2-2-39 Comparison of average sit and reach in students (cm)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
6 years	4.1	4.8	0.7	6.6	6.8	0.2
7 years	2.8	4.5	1.7	6.5	7.3	0.8
8 years	3.4	3.5	0.1 *	7.4	6.8	-0.6
9 years	3.1	2.0	-1.1*	6.0	5.4	-0.6
10 years	0.5	0.5	0.0*	4.8	4.4	-0.4
11 years	0.3	0.4	0.1	4.8	4.1	-0.7
12 years	0.5	0.1	-0.4	4.8	5.6	0.8
13 years	1.3	2.0	0.7	5.7	6.9	1.2
14 years	1.6	2.9	1.3	6.6	6.8	0.2
15 years	4.2	3.7	-0.5	6.4	8.7	2.3
16 years	6.3	5.1	-1.2	7.0	6.6	-0.4*
17 years	3.8	4.9	1.1	5.6	7.2	1.6
18 years	5.7	6.3	0.6	6.9	8.1	1.2
19 years	5.9	4.5	-1.4	4.6	6.8	2.2
20 years	5.4	4.1	-1.3	5.5	7.8	2.3
21 years	5.4	2.7	-2.7	6.6	6.6	0.0
22 years	1.5	5.8	4.3	6.1	5.1	-1.0

**2.2.5.5. Respond**

Comparison of the selective respond time in 2010 and 2005 showed that the results of male students in 2010 were higher or equal to the results in 2005 in the 10, 12~16 and 18~21 year age groups, of which there was significant difference in the 6 and 22 year age groups (P<0.05). Results of female students in 2010 were higher or equal to the results in 2005 in the 6, 10~20 and 22 year age groups, of which there was significant difference in the 18~20 year age groups (P<0.05). Comparison according to different school age groups, significant difference was found in the primary school and university age groups (P<0.05) (table 2-2-2-40).

**Table 2-2-2-40 Comparison of average selective respond time in students (sec)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
6 years	0.60	0.57	-0.03 *	0.62	0.62	0.00
7 years	0.55	0.54	-0.01	0.57	0.56	-0.01
8 years	0.51	0.49	-0.02	0.54	0.51	-0.03
9 years	0.48	0.45	-0.03	0.50	0.48	-0.02
10 years	0.44	0.44	0.00	0.46	0.47	0.01
11 years	0.43	0.42	-0.01	0.44	0.45	0.01
12 years	0.41	0.41	0.00	0.44	0.45	0.01
13 years	0.40	0.41	0.01	0.43	0.44	0.01
14 years	0.40	0.40	0.00	0.42	0.43	0.01
15 years	0.39	0.39	0.00	0.42	0.42	0.00
16 years	0.38	0.38	0.00	0.41	0.43	0.02
17 years	0.38	0.37	-0.01	0.42	0.42	0.00
18 years	0.38	0.38	0.00	0.42	0.44	0.02 *
19 years	0.39	0.39	0.00	0.42	0.44	0.02*
20 years	0.39	0.39	0.00	0.42	0.43	0.01*
21 years	0.39	0.40	0.01	0.44	0.43	-0.01
22 years	0.41	0.40	-0.01 *	0.42	0.43	0.01

**2.2.5.6. Balance**

One foot stands with eyes closed (OFSEC) was used to reflect balance ability. Comparison of the OFSEC results in 2010 and 2005 showed that, results of male students in 2010 were lower than 2005 in the 7, 8 and 10 year age groups, and were higher in 2010 in other age groups, of which significant difference was found in the 6, 7, 11, 14 , 15, 18 and 22 year age groups (P<0.05). Results of female students in 2010 were lower than 2005 in the 6~8, 12 and 17 year age groups, and higher in 2010 in other age groups, of which significant difference was found in the 17 and 22 year age groups (P<0.05). In terms of comparison according to different school age groups, significant difference was found in the OFSEC results in secondary school and university age groups(P<0.05), as shown by the fact that the time of OFSEC for students in 2010 was longer than that in 2005 (table 2-2-2-41).

**Table 2-2-2-41 Comparison of average OFSEC time in students (sec)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
6 years	11.2	14.5	3.3 *	16.2	14.7	-1.5
7 years	15.8	14.5	-1.3 *	19.6	16.4	-3.2
8 years	18.0	16.4	-1.6	24.3	22.5	-1.8
9 years	18.5	19.2	0.7	21.4	22.7	1.3
10 years	23.0	21.6	-1.4	26.2	29.3	3.1
11 years	21.9	31.9	10.0 *	27.4	27.7	0.3
12 years	28.0	30.2	2.2	33.5	31.7	-1.8
13 years	34.8	36.5	1.7	33.7	36.7	3.0
14 years	33.4	42.2	8.8 *	37.6	41.0	3.4
15 years	40.9	51.0	10.1 *	41.4	44.6	3.2
16 years	44.8	45.9	1.1	39.0	42.5	3.5
17 years	45.6	48.9	3.3	55.5	42.2	-13.3 *
18 years	45.3	60.5	15.2 *	47.2	54.7	7.5
19 years	49.3	56.5	7.2	45.7	60.5	14.8
20 years	44.0	54.6	10.6	44.1	53.7	9.6
21 years	54.6	62.7	8.1	38.1	58.3	20.2
22 years	43.5	52.1	8.6 *	40.2	55.8	15.6 *

**2.2.6. Comparison of Health Status**

**2.2.6.1. Occurrence of decayed primary teeth**

Dental decay of primary teeth of male and female students occurred mainly between aged 6~12. With the substitution of primary teeth by permanent teeth, the proportion of primary teeth decay became 0 gradually.

Proportion of primary teeth dental decay of male and female students in each age group was higher than that in 2005, of which the largest difference occurred in male students at age 7~10, with difference ranging from 16.5%~24.4%, and the difference in female students at age 6~9 was relatively large, ranging from 11.1%~30.6% (table 2-2-2-42).

**Table 2-2-2-42 Comparison of primary teeth decay in students (%)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
6 years	42.8	52.9	10.1	43.2	54.3	11.1
7 years	45.9	63.2	17.3	46.7	64.8	18.1
8 years	43.9	61.0	17.1	41.3	71.9	30.6
9 years	40.9	65.3	24.4	37.6	60.6	23.0
10 years	37.8	54.3	16.5	32.5	38.1	5.6
11 years	20.5	28.9	8.4	15.2	21.9	6.7
12 years	12.2	13.8	1.6	5.8	8.0	2.2
13 years	1.1	9.7	8.6	0.0	5.0	5.0
14 years	0.0	4.3	4.3	0.0	4.0	4.0
15 years	0.0	0.0	0.0	0.0	0.0	0.0
16 years	0.0	0.0	0.0	0.0	0.0	0.0
17 years	0.0	0.0	0.0	0.0	0.0	0.0
18 years	0.0	0.0	0.0	0.0	0.0	0.0

It could be seen that the percentage of decayed primary teeth being filled for male students was higher than that in 2005, and also higher in female students except in the 13 year age group. The difference for male students ranged from 1.6%~21.4%, with the largest difference found at age 9. The difference for female students ranged from -1.2%~22.2%, with the largest difference found at age 8 (table 2-2-2-43).

**Table 2-2-2-43 Comparison of decayed primary teeth filled in students (%)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
6 years	6.9	15.4	8.5	6.5	18.1	11.6
7 years	10.8	27.9	17.1	10.9	17.0	6.1
8 years	9.2	21.5	12.3	12.7	34.9	22.2
9 years	7.3	28.7	21.4	9.7	24.5	14.8
10 years	8.6	23.7	15.1	9.8	15.6	5.8
11 years	5.7	7.4	1.7	4.6	10.6	6.0
12 years	0.5	5.1	4.6	1.2	2.3	1.1
13 years	0.0	1.6	1.6	1.2	0.0	-1.2
14 years	0.0	1.9	1.9	0.0	0.6	0.6
15 years	0.0	0.0	0.0	0.0	0.0	0.0
16 years	0.0	0.0	0.0	0.0	0.0	0.0
17 years	0.0	0.0	0.0	0.0	0.0	0.0
18 years	0.0	0.0	0.0	0.0	0.0	0.0

Comparison of decayed primary teeth loss in the two studies showed that the percentage of decayed primary teeth loss in 2010 was significantly lower than that in 2005. The difference ranged from



-0.5%~-22.5% for male students and -0.6%~-15.7% for female students with the largest difference of decayed primary teeth loss occurring at age 6 (table 2-2-2-44).

**Table 2-2-2-44 Comparison of decayed primary teeth loss in students (%)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
6 years	25.4	2.9	-22.5	20.0	4.3	-15.7
7 years	12.6	4.0	-8.6	18.2	5.0	-13.2
8 years	9.2	4.1	-5.1	13.3	5.5	-7.8
9 years	13.0	4.0	-9.0	17.0	3.9	-13.1
10 years	18.9	0.6	-18.3	11.0	0.0	-11.0
11 years	10.2	1.3	-8.9	3.3	0.0	-3.3
12 years	2.7	0.5	-2.2	1.2	0.6	-0.6
13 years	0.6	0.0	-0.6	0.0	0.0	0.0
14 years	0.5	0.0	-0.5	0.0	0.0	0.0

**2.2.6.2. Occurrence of decayed permanent teeth**

The percentage of permanent teeth dental decay in 2010 was significantly higher than that in 2005. The difference ranged from 2%~23.3% for male students with the largest difference of 23.3% occurring at age 15. The difference ranged from 0.5%~18.4% for female students with the largest difference occurring at age 17 (table 2-2-2-45).

**Table 2-2-2-45 Comparison of permanent teeth decay in students (%)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
6 years	0.6	2.9	2.3	0.6	1.1	0.5
7 years	6.8	9.5	2.7	6.7	14.5	7.8
8 years	7.7	23.8	16.1	10.0	21.2	11.2
9 years	14.0	18.3	4.3	11.5	25.2	13.7
10 years	16.2	22.0	5.8	17.2	29.9	12.7
11 years	15.3	25.5	10.2	20.5	30.5	10.0
12 years	20.2	27.6	7.4	24.4	36.6	12.2
13 years	24.7	40.5	15.8	31.1	45.3	14.2
14 years	26.4	46.3	19.9	37.7	51.7	14.0
15 years	24.6	47.9	23.3	32.3	50.3	18.0
16 years	24.1	38.9	14.8	31.5	41.7	10.2
17 years	27.7	43.5	15.8	29.9	48.3	18.4
18 years	35.8	37.8	2.0	32.7	46.2	13.5

Percentage of decayed permanent teeth filled in 2010 was higher than that in 2005. The difference ranged from 1.7%~15.3% for male students with the largest difference of 15.3% occurring at age 13. The difference ranged from -3.8%~16.4% for female students with the largest difference occurring at age 15.

Decayed permanent teeth loss in 2010 was lower than that in 2005. The difference ranged from -0.4%~-3.4% for male students and 0.5%~-7.6% for female students (table 2-2-2-46 and table 2-2-2-47).

**Table 2-2-2-46 Comparison of decayed permanent teeth filled in students (%)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
6 years	0.0	0.0	0.0	0.0	0.0	0.0
7 years	1.4	4.0	2.6	1.2	6.9	5.7
8 years	2.6	6.4	3.8	4.0	6.8	2.8
9 years	4.1	10.4	6.3	4.2	14.8	10.6
10 years	6.5	16.2	9.7	4.9	12.9	8.0
11 years	6.3	18.8	12.5	12.6	23.2	10.6
12 years	11.2	22.4	11.2	14.5	25.7	11.2
13 years	11.2	26.5	15.3	23.2	27.0	3.8
14 years	12.6	23.5	10.9	24.5	34.1	9.6
15 years	17.3	26.6	9.3	26.8	43.2	16.4
16 years	20.1	34.0	13.9	33.7	49.2	15.5
17 years	36.7	39.8	3.1	46.7	42.9	-3.8
18 years	34.0	35.7	1.7	40.3	48.4	8.1

**Table 2-2-2-47 Comparison of decayed permanent teeth loss in students (%)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
6 years	1.2	0.0	-1.2	0.0	0.0	0.0
7 years	0.0	0.0	0.0	0.6	0.0	-0.6
8 years	1.5	0.0	-1.5	2.0	0.7	-1.3
9 years	2.1	0.0	-2.1	2.4	0.0	-2.4
10 years	0.5	0.0	-0.5	1.2	0.0	-1.2
11 years	1.7	1.3	-0.4	2.0	0.0	-2.0
12 years	1.1	0.5	-0.6	2.9	3.4	0.5
13 years	2.8	1.1	-1.7	1.8	1.3	-0.5
14 years	3.8	1.9	-1.9	3.3	2.8	-0.5
15 years	2.2	1.1	-1.1	3.0	2.4	-0.6
16 years	4.6	1.2	-3.4	4.9	1.1	-3.8
17 years	3.6	1.6	-2.0	7.2	2.5	-4.7
18 years	5.6	2.8	-2.8	11.9	4.3	-7.6

**2.2.6.3. Poor eyesight**

Poor eyesight is defined as eyesight below 5.0 without using glasses or contact lens. An eyesight of 4.9 is considered as mild poor eyesight, eyesight within 4.6~4.8 is considered as moderate poor eyesight and the eyesight below or equal to 4.5 is severe poor eyesight. Each subject was considered as a unit when doing the analysis. If the eyesight was different in different eyes, the one with poorer eyesight was used. Comparison of the proportion of poor eyesight in 2010 and 2005 showed that proportion of poor eyesight was higher than that in 2005 in all age groups except in the 6 year age group of the primary school, which indicated that the eye sights of primary school students were worsen in 2010. In the 13~18 year age groups, the proportion of poor eyesight in 2010 was higher than 2005 in all age groups except in the 18 year age group. Among the university age groups, the proportion of poor eyesight in 2010 was higher than 2005 except in the 19 and 20 year age groups (female) and 21 year age group (male) (table 2-2-2-48).

**Table 2-2-2-48 Comparison of poor eyesight in students (%)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
6 years	48.0	46.2	-1.8	54.2	38.3	-15.9
7 years	32.9	50.7	17.8	45.5	54.7	9.2
8 years	42.9	58.7	15.8	38.7	60.3	21.6
9 years	43.5	61.9	18.4	46.1	68.4	22.3
10 years	54.1	71.5	17.4	52.8	65.3	12.5
11 years	54.0	70.5	16.5	57.0	72.8	15.8
12 years	62.2	75.0	12.8	64.5	77.7	13.2
13 years	58.4	74.5	16.1	69.5	75.5	6.0
14 years	63.2	73.3	10.1	76.2	82.4	6.2
15 years	67.6	79.3	11.7	72.7	86.3	13.6
16 years	73.6	74.7	1.1	81.0	82.9	1.9
17 years	76.5	76.8	0.3	79.0	83.7	4.7
18 years	81.5	69.9	-11.6	82.4	80.5	-1.9
19 years	83.3	80.4	-2.9	86.6	82.0	-4.6
20 years	80.4	86.5	6.1	84.7	82.8	-1.9
21 years	72.7	72.6	-0.1	80.6	84.4	3.8
22 years	70.7	72.4	1.7	84.4	86.5	2.1

Comparison of the proportion of moderate and severe poor eyesight showed that the proportion of severe poor eyesight in 2010 was higher than 2005 in all age groups except in the 18 and 21 year age groups, with a difference ranging from -4.7%~13.6%. The proportion of moderate poor eyesight was higher than 2005 in all age groups except in the 6, 10, 14 and 17~19 year age groups (table 2-2-2-49).

**Table 2-2-2-49 Comparison of moderate and severe poor eyesight in students (%)**

Age Group	Moderate			Severe		
	2005	2010	Difference	2005	2010	Difference
6 years	24.4	13.1	-11.3	7.3	9.1	1.8
7 years	16.3	19.2	2.9	9.8	18.6	8.8
8 years	17.7	22.6	4.9	13.9	23.3	9.4
9 years	17.9	20.7	2.8	18.4	30.3	11.9
10 years	20.4	20.1	-0.3	25.9	36.7	10.8
11 years	15.9	16.0	0.1	32.7	46.3	13.6
12 years	17.5	18.9	1.4	40.0	51.5	11.5
13 years	13.8	17.8	4.0	44.9	50.1	5.2
14 years	16.3	15.1	-1.2	49.1	56.1	7.0
15 years	13.8	16.6	2.8	53.3	60.1	6.8
16 years	15.6	16.0	0.4	55.9	58.7	2.8
17 years	13.6	11.6	-2.0	59.9	63.4	3.5
18 years	13.7	11.6	-2.1	65.1	60.4	-4.7
19 years	15.4	11.3	-4.1	65.6	66.5	0.9
20 years	14.5	15.4	0.9	62.5	65.1	2.6
21 years	12.4	18.8	6.4	59.9	56.5	-3.4
22 years	19.8	21.6	1.8	54.7	55.7	1.0

**2.2.6.4. Color vision**

Color vision is used to reflect the children and adolescents' ability to distinguish colors. Through comparison of results in the two studies, it was found that the proportion of abnormal color vision in 2010 was higher than that in 2005, which indicated that the color vision of students in 2010 was poorer than students in 2005 (table 2-2-2-50).

**Table 2-2-2-50 Comparison of abnormal color vision in students (%)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
6 years	3.5	11.5	8.0	0.6	7.5	6.9
7 years	1.8	15.7	13.9	0.0	23.3	23.3
8 years	1.0	28.7	27.7	0.0	18.5	18.5
9 years	1.6	15.8	14.2	0.6	9.7	9.1
10 years	0.0	8.1	8.1	0.0	6.1	6.1
11 years	1.7	6.0	4.3	0.0	4.0	4.0
12 years	1.1	9.2	8.1	0.0	3.4	3.4
13 years	1.1	7.6	6.5	0.0	3.8	3.8
14 years	2.2	8.1	5.9	0.0	1.7	1.7
15 years	1.1	5.9	4.8	0.0	3.0	3.0
16 years	1.7	6.2	4.5	0.0	2.1	2.1
17 years	1.2	5.9	4.7	0.0	2.0	2.0
18 years	1.2	4.2	3.0	0.0	0.5	0.5
19 years	2.5	2.9	0.4	0.0	0.0	0.0
20 years	4.9	6.3	1.4	0.0	0.0	0.0
21 years	3.0	17.0	14.0	0.0	1.0	1.0
22 years	6.1	4.6	-1.5	0.0	0.0	0.0

## 2.3. Summary

### 2.3.1. Summary of 2010 Results on the Physical Fitness Study of Children and Adolescents (Students)

The above results indicated that physical growth and development of Macao children and adolescents (aged 6~22) were primarily characterized by rapid growth in puberty. The growth in height, sitting height, foot length, shoulder and pelvis widths and other indexes were completed or nearly completed at this stage. The length indexes mainly showed an increase at different stages. When compared with growth in body height, the growth of foot length was the first to complete. As the growth rate of height slowed down while weight maintained a rapid increase, BMI tended to increase year after year. The growth rate of waist circumference was slower than that of the hip circumference, resulting in a decrease in WHR as age increased. Besides, since the hip circumference of males and females were similar while the waist circumference of males was significantly larger than females, the WHR of males were significantly larger than females. The variation trend of percentage body fat and skinfold thickness of both males and females was basically similar, but the change in lean body mass was different. When percentage body fat decreased or remained the same in males, the lean body mass continued to increase. The lean body mass remained constant when percentage body fat increased in females. This indicated that the increase in weight was mainly due to the increase in lean body mass in males and increase in body fat in females.

Overall physiological function increased apparently with age, as shown by the decrease in resting pulse and the increase in blood pressure and vital capacity, which was an apparent characteristic during the rapid growth of puberty. Significant difference was seen in physiological function between genders, as indicated by the higher resting pulse, blood pressure and vital capacity in males than females and the physiological function of females improved mildly with age.

Physical fitness increased with age and some indicators showed a 4-fold increase. Among all physical fitness indexes, speed increased in the same way as explosive force and maximum force. Endurance strength of females varied in the same way as endurance run. Speed, strength and respond ability were better in male than female students. However, females had better flexibility than males. There was no significant difference in balance ability between genders. The difference in speed, strength and endurance between males and females increased with age, especially for strength.

In terms of health indexes including permanent teeth decay (D), decayed permanent teeth filled (F), loss (M), DMF and poor eyesight, these proportion increased with age. Some indexes had a significant difference between genders. No obvious change with age was seen in the proportion of abnormal color vision. The increase trend of nearsightedness with age needed to be emphasized and needed to draw attention from all parties.

### 2.3.2. Comparison of 2010 and 2005 Results on the Physical Fitness Study of Children and Adolescents (Students)

In terms of Macao children and adolescents lifestyle (aged 6~22), students who spent less than 30 minutes on outdoor activities after school, and students who spent 2~3 hours on homework were increasing. Significant increase was seen in female students spending over 3 hours on watching TV or playing computers. This indicated that aside from time spent on doing homework, students spent most of their leisure time on indoor activities rather than doing outdoor activities.

There was a significantly decrease in the proportion of students participating in hobby classes and sports. The proportion of students who had 2 PE classes per week decreased and those who had 1 PE class per week increased. In terms of extracurricular physical exercise, students who never participated in extracurricular physical exercise increased, while frequent exercisers decreased gradually, and the proportion of frequent exerciser was even less among university students. The proportion of student who had perceived low exercise intensity during PE classes decreased; meanwhile, those who had perceived high exercise intensity during exercise increased. This indicated that the physical fitness of students had adapted to a lower exercise intensity; therefore, students felt exhausted easily with a higher intensity of exercise, meaning that the physical fitness of students was decreasing gradually.

Physical growth and development of the body were mainly marked by the rapid growth during puberty. Comparison of height, sitting height, foot length, shoulder and pelvis width and other indexes in the two studies showed that, there was an increase in length index, and the range of increase tended to be primary school > secondary school > university students according to school age groups, which was consistent to the law of growth and development of the human body. Comparison of length index with circumference and weight indexes showed that, the development of length index was earlier than weight and circumference index. While the growth rate of height slowed down, weight continued to increase rapidly. Among the three circumference indexes, chest circumferences of female students in 2010 were smaller than 2005 among primary school age groups; nonetheless, the three circumferences in other age groups had increased. Analysis of skinfold thickness showed that fat in upper arm and scapula decreased, and fat in the abdomen increased (after aged 19), which indicated that fat distribution tended to be “apple shape”.

Comparison in physiological function in the two studies showed that both resting pulse and vital capacity decreased and blood pressure increased as age increased, which indicated that the function of the respiratory and circulatory system were decreasing.

Comparison of physical fitness in the two studies showed that there was a decrease in speed, endurance and strength. and the decrease in grip strength, back strength, vertical jump, endurance run were significant, of which the range of decrease was even larger in females than-males, and the significant decrease in strength with age was seen at ages after primary school. However, there was an improvement in respond time in primary school age groups and an improvement in balance capability at ages after primary school.

In terms of health indexes, an increase was seen in the proportion of primary teeth dental decay, decayed primary teeth filled, and permanent teeth dental decay, but there was a decrease in decayed

permanent teeth loss and decayed primary teeth loss, which showed that as the living standard was improving, the problem with student oral cavity was also increasing at the same time. However, advancement in medical technology strengthened the ability of tooth restoration, resulting in significant decrease in the percentage of decayed teeth loss.

In terms of poor eyesight, the proportion increased in primary school age groups, a sign that protection of the vision for primary school students should be enhanced. Analysis of moderate and severe poor eyesight of secondary school and university students showed that, although the increase in the proportion of poor eyesight was not as significant among secondary school and university students, the proportion of severe and moderate poor eyesight increased enormously, which indicated that the diopetre value of the lens of secondary school and university students were higher than those in 2005.

### **3. Adults**

#### **3.1. Physical Fitness Conditions of Adults in 2010**

##### **3.1.1. Basic Information of the Subjects**

Adult subjects were divided into two groups, labour-intensive and non-labour intensive workers, and the groups were further divided according to gender and age, with a five-year difference in each age group, i.e. 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50-54 and 55-59, altogether 32 groups.

The adult subjects of labour-intensive and non-labour intensive workers were randomly drawn from 32 government and private institutions in Macao (10 government institutions and 22 private institutions), of which 1240 subjects were from Macao Government (622 males and 618 females) and 2300 subjects were from private institutions (939 males and 1361 females) (table 3-3-1-1). Non-labour intensive workers were mainly composed of institution leaders, technicians and assistant professionals, professionals and office staffs. The proportion of the four different types of occupation was 80.3 % males and 84.4 % females. Male labour intensive workers were composed of service representatives, sales and workers of the same category, non-technicians, machine and platform operators, drivers and assemblers and others. The proportion of males in the four different types of occupation was 74.5 %. Female labour intensive workers were composed of four types of occupation, service representatives, sales and workers of the same category, non-technicians, others and household duties, and the proportion of females in the four different types of occupation 73.8 % (table 3-3-1-2).

In terms of sample size in the labour-intensive and non-labour intensive groups, the north area (Paróquia de Nossa Senhora de Fátima) had 1157 subjects (516 males and 641 females), the central area (Paróquia de Santo António and Paróquia de S. Lázaro) had 1082 subjects (456 males and 626 females), and the south area (Paróquia de São Francisco Xavier, Paróquia de Nossa Senhora do Carmo, Paróquia de S.Lourenço and Paróquia da Sé Catedral) had 1298 subjects (587 males and 711 females) (table 3-3-1-3).

The number of subjects in each adult age group was shown in table 2-3-1-1 and the number of labour intensive and non-labour intensive workers was shown in table 2-3-1-2.

**Table 2-3-1-1** Number of adult subjects

Age Group	Occupation	Male	Female	Total
20~24 years	Non-labour intensive	97	104	201
	Labour intensive	90	92	182
25~29 years	Non-labour intensive	106	110	216
	Labour intensive	95	99	194
30~34 years	Non-labour intensive	105	105	210
	Labour intensive	90	95	185
35~39 years	Non-labour intensive	99	126	225
	Labour intensive	90	106	196
40~44 years	Non-labour intensive	87	142	229
	Labour intensive	91	119	210
45~49 years	Non-labour intensive	97	157	254
	Labour intensive	102	160	262
50~54 years	Non-labour intensive	93	138	231
	Labour intensive	126	202	328
55~59 years	Non-labour intensive	94	100	194
	Labour intensive	99	124	223

**Table 2-3-1-2** Sample size of labour and non-labour intensive workers

Gender	Age Group (Years of age)							
	20~24	25~29	30~34	35~39	40~44	45~49	50~54	55~59
Male	187	201	195	189	178	199	219	193
Female	196	209	200	232	261	317	340	224
Total	383	410	395	421	439	516	559	417

Among the 3540 adult subjects, 57.0% of males and 51.2% of females were born in Macao, 32.3% of males and 41.0% of females were born in Mainland China; and the places of birth had shown an age related trend, i.e., the proportion of people born in Mainland China increased as age increased, and one third to half of adults were born in Mainland China at the age group of 35 (table 3-3-1-4). As for education level, secondary education (secondary school and university) accounted for the highest proportion (77.0% males and 74.5% females), and elementary education (primary school and under) accounted for a lower proportion (14.6% males and 17.0% females). About 8% (8.3% males and 8.5% females) of the subjects possessed master degrees or higher. In addition, a significantly higher proportion of subjects under the age of 39 possessed an associate or university degree than subjects over the age of 40 ( $P < 0.01$ ). Subjects with master degrees were mainly distributed in the 30~44 year age groups (table 3-3-1-5).

Working indoors accounted for the highest proportion, with 80.9% of males and 97.5% of females. 63.0% of males and 73.8 % of females worked under “air conditioned” environment for a long period of time. The proportion of females working indoors was significantly higher than that of males ( $P < 0.01$ ). As



age increased, the proportion of subjects who worked under “air conditioned” environment tended to decrease while the proportion of subjects who worked under “naturally ventilated” environment tended to increase. Only 2.5% females versus 19.1 % males often worked outdoors (table 3-3-1-6).

Among the studied samples, 82.4% of males and 69.3% of females normally worked 35~50 hours per week. For those who worked an average of 40~50 hours per week, the 25~45 year age groups of males and the 20~45 year age groups of females accounted for the highest proportion. However, 8.2% of males and 18.2% of females worked an average of less than 20 hours or between 20~35 hours per week. The proportion of “non-working” females (4.6%) was significantly higher than that of the males (3.7%). The proportion of “non-working” males and females tended to be “high at both ends” across age. The proportion of males who worked over 50 hours (5.6%) was significantly lower than that of females (7.9%). There was no significant difference in the proportion of people who worked over 50 hours or above in males after 25 years old and in females after 30 years old. (table 3-3-1-7).

### **3.1.2. Lifestyle**

For adults aged 20~59, their habit, exercise pattern, occurrence of diseases and understanding of the fitness study were examined.

#### **3.1.2.1. Habits**

Habits included daily sleeping hours and sleeping quality, accumulated walking and sitting hours, activity manners during leisure time, smoking and alcohol consumption.

Most adults slept for an average of 6~9 hours daily (81.8%), 15.2% slept for less than 6 hours, and only 3% slept for 9 hours and above. There was no difference among genders in sleeping hours. As age increased, the sleeping hours gradually decreased (table 3-3-2-1). 68.4% of the adults considered their sleeping quality to be satisfactory. More males considered their sleeping quality to be satisfactory than females. The highest proportion of males who considered their sleeping quality to be poor was found in the 30~34 year age group (13.3%). The proportion of female who had poor sleeping quality went up gradually with age (table 3-3-2-2).

As for average daily walking hours (excluding the time for walking during physical exercise), 47.4% walked less than 30 minutes, 31.4% walked for 30~60 minutes, 21.2% walked for one hour or above. No significant difference was found in the walking time for more than one hour per day between males and females. The walking hours tended to increase after age 45 for males and 40 for females (table 3-3-2-3).

6.2% of the adult subjects sat for an average of less than 3 hours daily, 37.5% for 3-6 hours, 26.2% for 6~9 hours and 20% for above 9 hours. No significant difference was seen between males and females in the average daily sitting time. As age increased, adults with daily sitting hours less than 3 hours tended to increase (table 3-3-2-4).

The most popular activity during leisure time was audio-visual entertainment (64.2%). Other than that, other popular activities in descending order for males was physical exercise, social gathering, sleeping housework and traveling; the descending order for females was housework, social gathering,

sleeping and physical exercise.

The types of leisure activity differed by age groups. With the exception of audio-visual entertainment, the proportion of males choosing traveling, social gathering and sleeping decreased as age increased, but those who chose housework increased, and physical exercise was relatively stable. Major activities for females aged 20~29 were audio-visual entertainment, social gathering, and sleeping. After age 30, the proportion of females doing housework increased significantly, which was also the most frequent leisure activity for females was housework, followed by audio-visual entertainment after age 40. Physical exercise also gradually became one of the major activities for females at age 45~59 (table 3-3-2-5).

Our study showed that 20.8 % of males and 2.9 % of females currently have smoking habit. The proportion of male smokers of different ages did not vary much, but females tended to smoke less as age increased (figure 2-3-1-1).

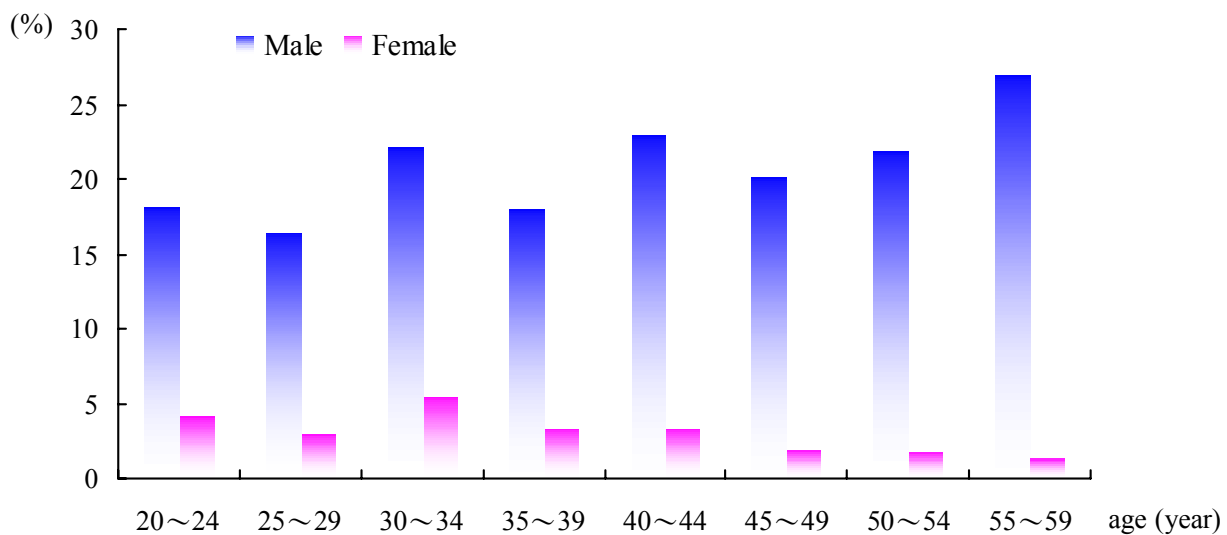


Figure 2-3-1-1 Proportion of adult "current smokers"

Regarding to the smoking population, 38.8% of males smoked less than 10 cigarettes per day , 48.6% of males smoked 10~20 cigarettes per day and 12.6% of males smoked above 20 cigarettes, whereas 73.7% of females smoked less than 10 cigarettes per day. As age increased, the proportion of male smokers who smoked less than 10 cigarettes per day decreased, whereas those who smoked above 10 cigarettes per day increased. The amount of smoking in different age groups remained at less than 10 cigarettes per day for females (except in the age groups of 55~59) (table 3-3-2-6).

Among smokers (current and ex-smokers), 45.2% of males had smoked for over 15 years, which account for the highest proportion, while most females (31.6%) had smoked for less than 5 years (table 3-3-2-7). As for adults who had quitted smoking, 23.9% of males had quitted smoking for less than 2 years and 76.1% had quitted smoking for over 2 years. Among female smokers, 36.8% had quitted smoking for less than 2 years and 63.2% had quitted for over 2 years (table -3-2-8).

52.4% of males and 19.8% of females had drinking history, and the difference between genders was significant ( $P < 0.05$ ). Males in the 25~29 year age groups accounted for the highest proportion that consumed alcohol (61.7%), and other age groups accounted for about 50%. Females in the 20~29 year age groups accounted for a relatively high proportion, and the proportion of female drinkers decreased as age increased (figure 2-3-1-2 and table 3-3-2-9).

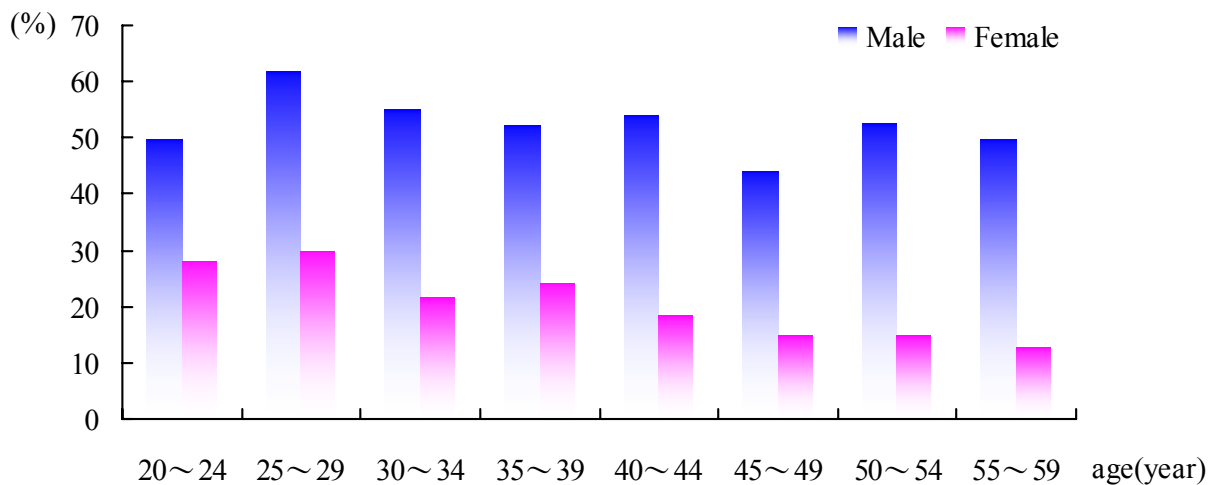


Figure 2-3-1-2 Proportion of alcohol consumption in adults

Among drinkers, 48.2% of males consumed alcohol once a month, 34.4% consumed 1~2 times a week, 9.2% consumed 3~4 times a week, and only 8.2% consumed alcohol 5~7 times a week. For females, drinking once a month accounted for the highest proportion (67.9%) (table 3-3-2-10). Most adults drank beer (46.1%), followed by wine or fruit wine (32.8%). The type of alcohol chosen by males was beer, and for females, wine or fruit wine were the most popular (table 3-3-2-11).

### 3.1.2.2. Physical exercise

Among the studied subjects, 69.5% participated in physical exercise and most of them exercised less than twice a week (64.4%), with each time lasting for more than 30 minutes (65.6%) and with a moderate intensity level (54.5%). In addition, persistent exercising for less than 1 year accounted for the highest proportion (51.0%), 21.4% persisted for 1~5 years, and 27.5% persisted for over 5 years. Exercise frequency and duration differed between genders. More females (36%) exercised for more than 3 times a week compared to males (35.1%), and more males (66.7%) exercised for more than 30 minutes or more each time compared to females (64.5%). The proportion of males doing high intensity exercise (39.3%) was higher than females (19.1%) ( $P < 0.05$ ), and the proportion of males who persisted exercising for over 5 years (34.8%) was also higher than females (20.7%) ( $P < 0.05$ ). As age increased, weekly exercising frequency increased, but exercise intensity tended to decrease. The highest proportion in adults who persisted exercising for no more than 6 months was seen before age 40 in males and before age 50 in females, and as age increased, the proportion decreased gradually. The proportion of adults continuing exercising for over 5 years increased as age increased, and the exercising duration decreased in males and

increased in females (table 3-3-2-12, table 3-3-2-13, table 3-3-2-14 and table 3-3-2-15).

Subjects were classified into frequent, occasional and non-exercisers according to weekly exercise frequency, exercise duration and intensity (see “Part II. Children and Adolescents” for definitions). The results showed that frequent exerciser accounted for 15.5%, occasional exerciser accounted for 54.1% and non-exerciser accounted for 30.5%. There was a significant difference among genders in the proportion of frequent, occasional and non-exercisers. Frequent and occasional exercisers accounted for a higher percentage in males (16.7% and 59.6%, respectively) than females (14.5% and 49.7%, respectively) ( $P < 0.05$ ). Males and females appeared to have different characteristics on physical exercise at different age groups. For males, the proportion of frequent exercisers increased while occasional exercisers decreased as age increased. The percentage of non-exercisers did not vary greatly in each age group. For females, the proportion of frequent exercisers increased rapidly while occasional exercisers and non-exercisers decreased gradually as age increased (figure 2-3-1-3 and figure 2-3-1-4).

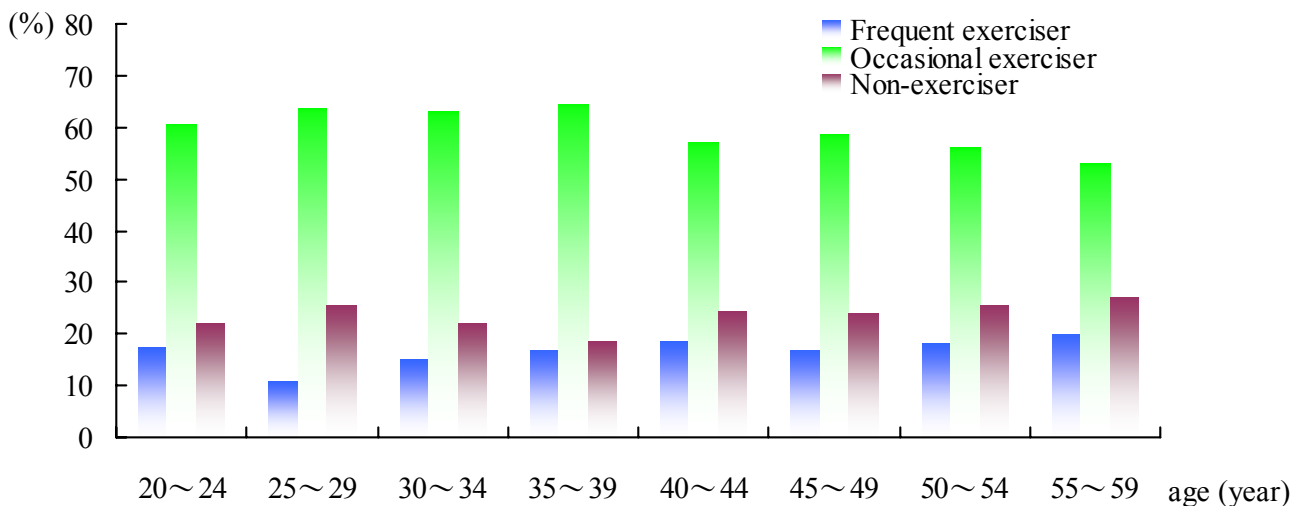


Figure 2-3-1-3 Proportion of frequent, occasional and non-exercisers in adult males

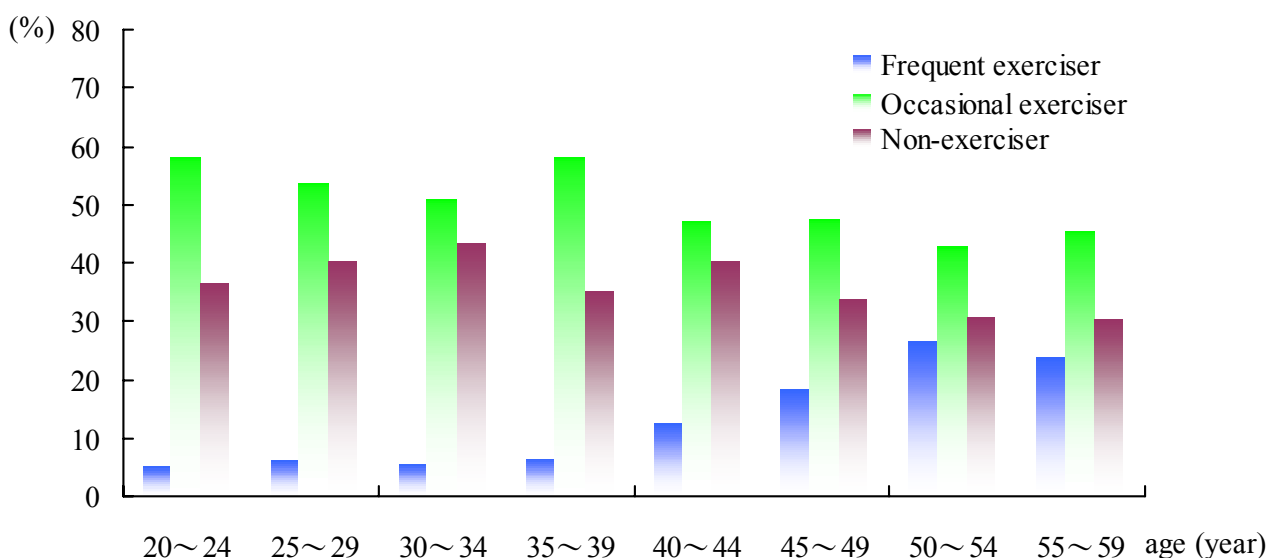


Figure 2-3-1-4 Proportioning of frequent, occasional and non-exercisers in adult females

Frequent exercisers who kept exercising for over 5 years had the highest proportion (47.3%), followed by 1~3 years (19.7%) and 3~5 years (12.6%). The proportion of occasional exercisers who had exercised for less than 6 months was 47.0%, followed by over 5 years (21.8%) and 1~3 years (13.0%).

The main purposes for males to participate in physical exercise was to improve physical skills (62.0%), cure and prevent diseases (56.1%), relieve pressure and regulate mood (55.5%). The aims for frequent and occasional exercisers were generally the same. The aims of doing physical exercise for females were to prevent and cure diseases (66.9%) and to relieve pressure (56.7%). Frequent exercisers focused more on improving physical skills and occasional exercisers focused more on losing weight and keeping fit. The reasons for doing exercise varied with age groups. The major purposes of exercising before age 45 were to improve physical skills, relieve pressure, regulate mood, lose weight and keep fit. For age 45~59, the major purpose was to prevent and cure diseases (table 3-3-2-16).

Major locations where adults exercised were park (52.1%), stadium or gym (49.2%), open area, road or street (39.9%), office or residential area (15.6%), and recreational club (11.9%). For exercising locations, stadium or gym was the first choice and then park for males, where park was the first and then stadium or gym for females. No significant difference was seen in the choices of locations between frequent and occasional exercisers. It was worth noting that less people went to gym or stadium and more people went to park as age increased (table 3-3-2-17).

As for the types of sports that the adult exercisers participated in, 23.4% participated in 1 type, 28.8% in 2 types, and 47.7% in 3 types of sports. The top 6 sports with the highest participation were walking (52.0%), jogging (46.1%), ball games (32.5%), swimming (24.7%), work out and strength training (11.3%) and aerobics and yangko (11.2%). There was difference among genders in sports choices. Males usually participated in sports such as jogging, ball games, walking, swimming, work out and strength training while females usually chose walking, jogging, ball games, swimming, aerobics and yangko etc. Frequent and occasional exercisers generally chose the same types of sports. An association between sports choices and age was seen. As age increased, the proportion of subjects who jogged and played ball games reduced while more subjects participated in walking, aerobics and yangko, martial arts and qigong (table 3-3-2-18).

A further examination on the choices of ball games by Macao adults showed that a large percentage of male participants participated in football, basketball, badminton and table tennis. As for females, the most favorite in each age group was badminton, followed by ping pong (table 3-3-2-19).

The study had also investigated on the 12 obstacles that hindered adults to participate in physical exercise. The major obstacles were lack of time (62.5%), laziness (55.6%), lack of location and facilities (20.7%) and lack of interest (14.1%). The obstacles for exercising weighed differently among frequent exercisers, occasional exercisers and non-exercisers. Frequent exercisers were unable to exercise due to embarrassment and financial limitations while the major obstacles for occasional exercisers were lack of location and facilities, lack of organization and lack of time. For non-exercisers, the crucial reasons were lack of interest, and work was too labour intensive, hence it was unnecessary to exercise further. No

significant difference in obstacles was seen between males and females (table 3-3-2-20).

In addition, the frequently watched sports by Macao male adults were football (61.7%) and basketball (42.5%) while the rest of the 15 items did not exceed 20%. As age increased, the proportion for those watching football tended to be stable and those watching basketball decreased, while the proportion of those watching swimming, table tennis, and others tended to increase. Females mainly watched swimming (40.8%), gymnastics (32.7%) and volleyball (27.6%). The proportion of females watching different sports in all age groups was basically stable, and the most favorite sports being watched were football (40.3%), basketball (31.6%) and swimming (29.1%). The proportion of males and females watching basketball decreased as age increased. For both males and females, swimming, football and basketball were the most favorite sports being watched. For swimming, the highest proportion was seen at age 40~44 in males (24.6%) and at age 35~39 in females (47.5%). For football and basketball, the highest proportion was seen at age 25~29 in males and at age 20~24 in females, and the proportion was higher than that in other age groups (table 3-3-2-21).

### 3.1.2.3. Occurrence of diseases

Our results showed that 28.8% of the 3,540 subjects (age 20~59) had been diagnosed with diseases by hospital in the past 5 years. The diseases with the highest percentages in descending order were hypertension (28. %), diseases of the digestive system (21.2 %), and respiratory diseases (17.0%). A significant difference was seen between genders where 26.8% of males and 30.4% of females had diseases ( $p<0.05$ ). The top three diseases diagnosed most for both males and females were hypertension, diseases of the digestive system and respiratory disease; meanwhile, the fourth was accidental injury for males and cancer for females. The proportion of subjects diagnosed with disease increased with age (figure 2-3-1-5) and the types of diseases diagnosed varied with age groups. A relatively high proportion of subjects at age 20~30 had diseases in the digestive system, respiratory diseases and accidental injury while the proportion with hypertension, cardiovascular disease and cancer increased rapidly after 45 years old (table 3-3-2-22 and table 3-3-2-23).

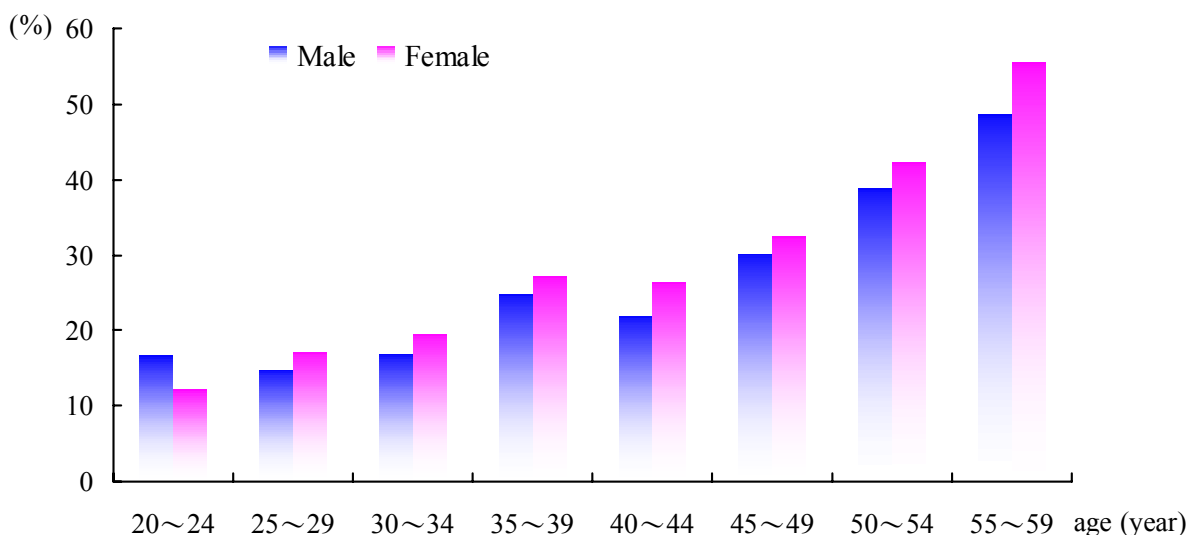


Figure 2-3-1-5 Adults with diseases in the past five years

3.1.2.4. Understanding of the physical fitness study

Among age 20~59 adults, 68.8% (68.2% males and 69.4% females) had heard of the physical fitness study. More than 60% adults in all age groups had heard of the physical fitness test (figure 2-3-1-6, table 3-3-2-24).

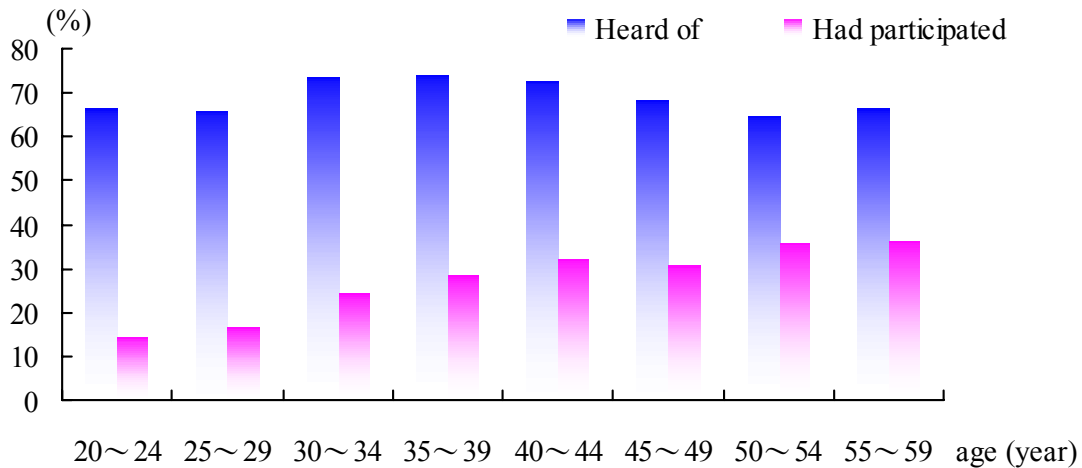


Figure 2-3-1-6 Adults heard of or had participated in physical fitness test

Among age 20~59 adults, only 28.0% (27.1% males and 28.7% females) had previously participated in the physical fitness study. As age increased, the proportion tended to increase, and more than 30.0% of male and female adults over 40 years old had participated in the physical fitness study before (table 3-3-2-24).

In regards to the understanding of physical fitness study, 95.7% of the participants considered fitness study as a venue “to understand their fitness status”, 59.2% considered it helpful “to recognize the importance of physical exercise”, 50.0% felt that it could “improve scientific knowledge about fitness”, and 3.0% considered it as “of no significance”. The meaning of the physical fitness study to the subjects was generally the same between genders and among age groups (table 3-3-2-25).

3.1.3. Anthropometric Measurements

3.1.3.1. Length indexes

The height of males and females tended to decline as age increased. Not only was this a natural phenomenon, it also reflected that people nowadays with increasing living standard were taller than people of the same age before. The average height of males and females ranged from 171.5~166.5 cm and 159.0~155.5 cm, respectively (figure 2-3-1-7 and table 3-3-3-1).

The sitting height of males and females tended to decrease as age increased. The average sitting height for males and females ranged from 92.3~89.7 cm and 86.0~84.3 cm, respectively (figure 2-3-1-8 and table 3-3-3-2).

Foot length stopped increasing during adolescence and remained stable without much changes during adulthood. The average foot length for males and females ranged from 24.8~25.3 cm and 22.5~22.6 cm,

respectively (figure 2-3-1-9 and table 3-3-3-3).

The average height, sitting height and foot length varied similarly for males and females, with all three indexes higher in males than females ( $P < 0.01$ ). The differences between males and females were 11.0~13.2 cm for height, 5.4~6.4 for sitting height and 2.3~2.8 cm for foot length.

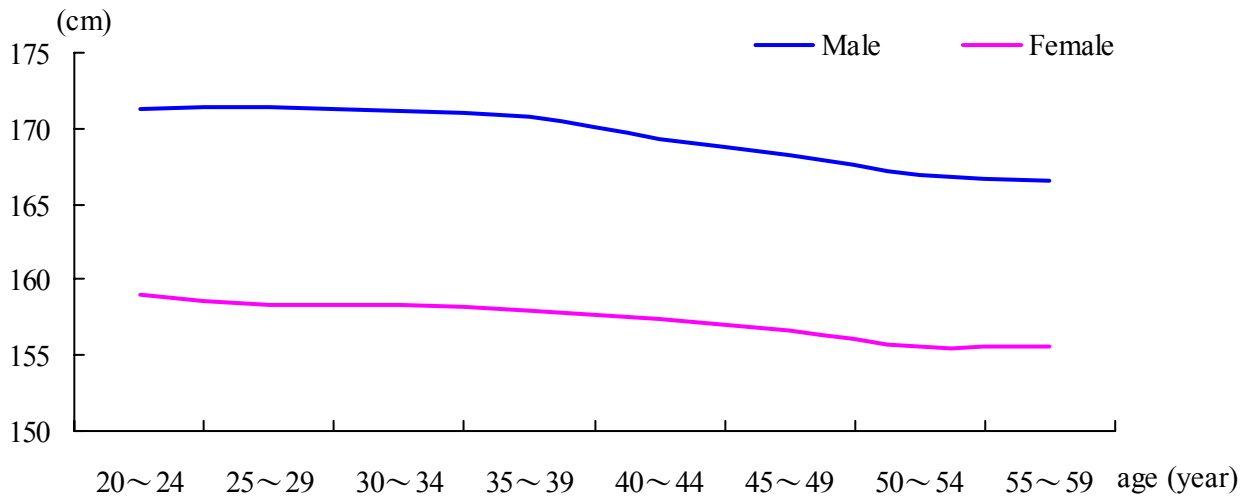


Figure 2-3-1-7 Average height of adult

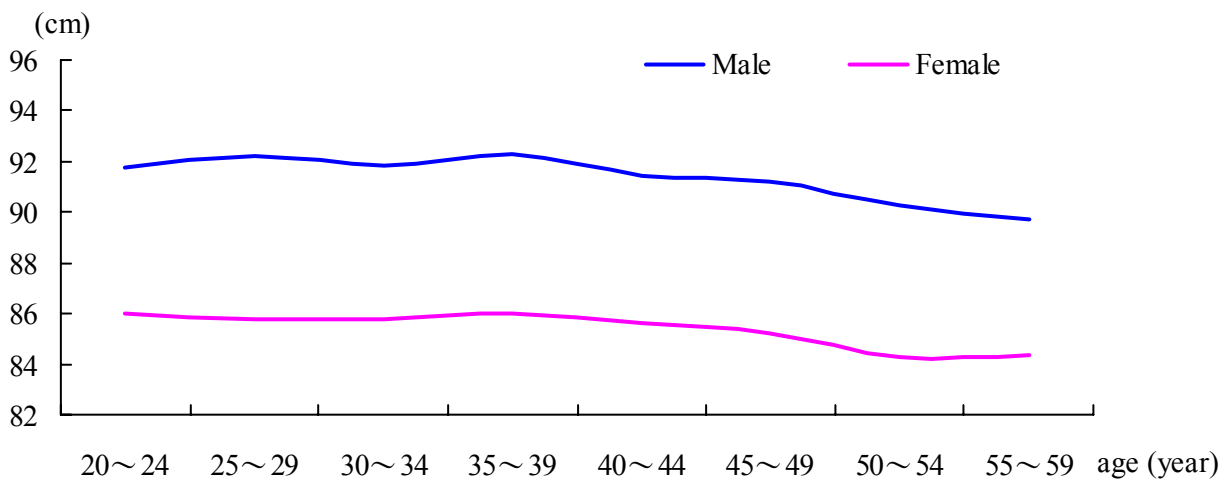


Figure 2-3-1-8 Average sitting height of adults

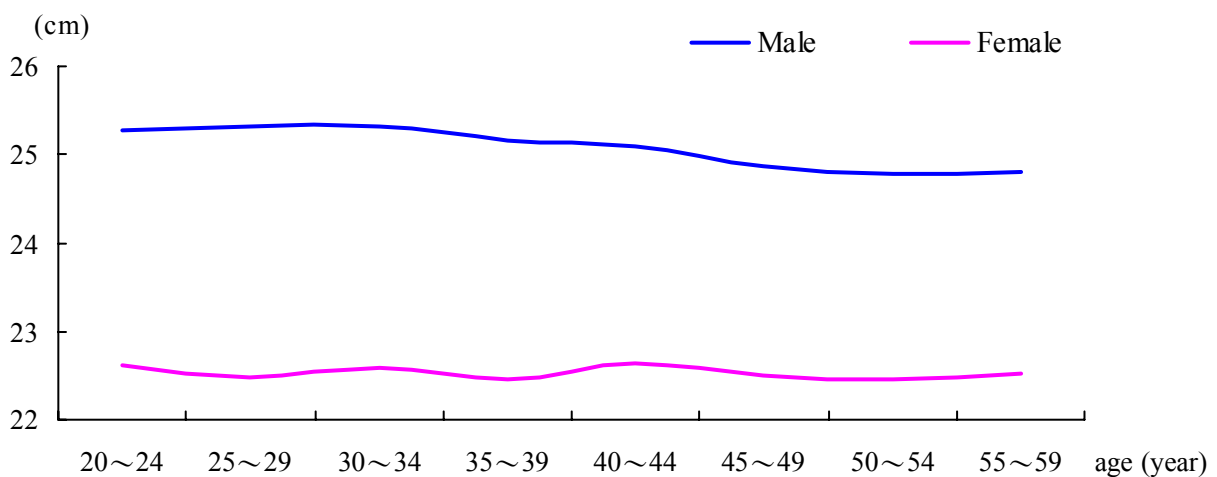


Figure 2-3-1-9 Average foot length of adults



3.1.3.2. Weight and BMI

Weight of male adults continued to increase with age before age 40 and tended to decreased gradually afterwards. For females, weight continued to increase with age. The average weight for males and females ranged from 64.3~69.6 kg and 50.3~57.0 kg, respectively (table 3-3-3-4). Males had a significantly higher weight than females ( $P < 0.01$ ) and the difference decreased as age increased. The average weight difference between genders ranged from 8.8~16.3 kg and the difference was significant (figure 2-3-1-10).

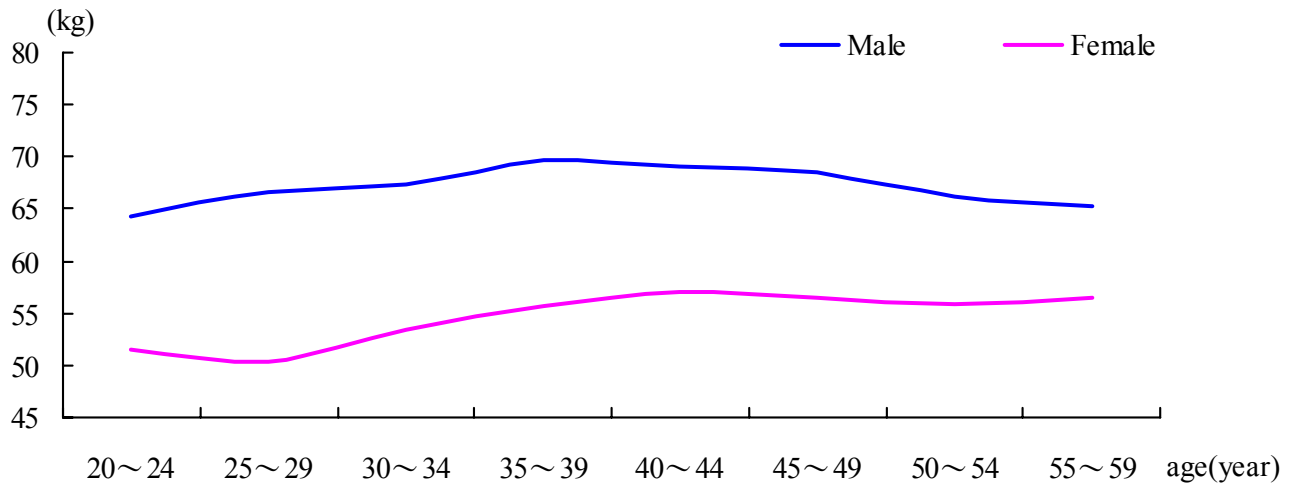


Figure 2-3-1-10 Average weight of adults

BMI of males increased with age before age 50 and remained stable afterwards. BMI of females aged 20~59 increased with age. Average BMI for males and females ranged from 21.9~24.2 and 20.1~23.3, respectively (table 3-3-3-5). Males had a significantly higher BMI than females, the difference in BMI between males and females decreased as age increased and the difference ranged from 0.2~2.5 ( $P < 0.01$ ) (figure 2-3-1-11).

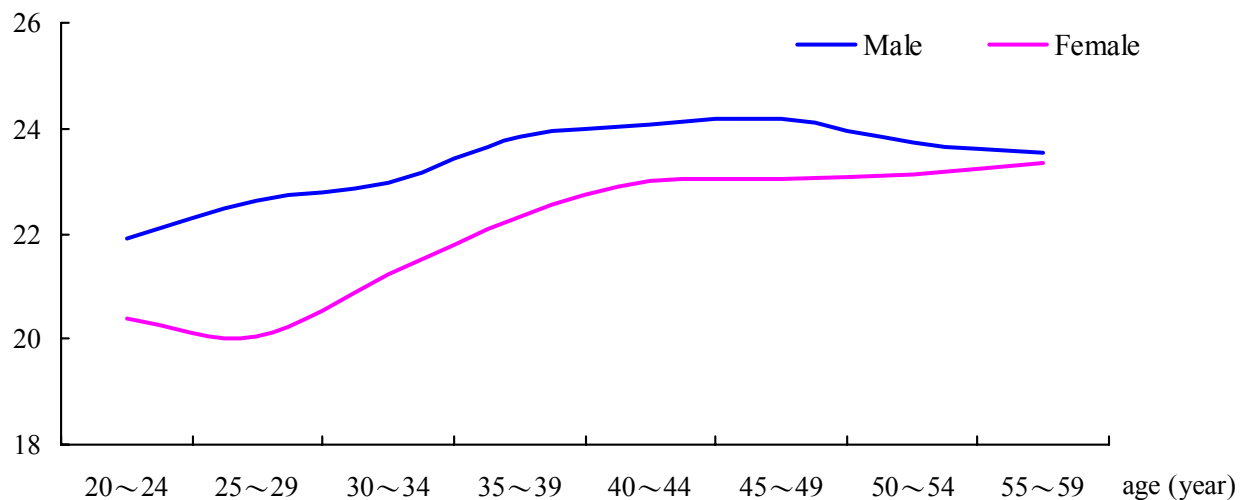


Figure 2-3-1-11 Average BMI of adults

According to the recommended standard of BMI grouping by China Obesity Problem Working Team, underweight is defined as  $BMI < 18.5$ , normal weight is defined as  $18.5 \leq BMI < 24.0$ , overweight is considered as  $24.0 \leq BMI < 28.0$ , and obesity is defined as  $BMI \geq 28.0$ .

Among 20~59 age groups, 4.5%~13.5% males had a  $BMI \geq 28.0$  and the proportions at each age group were: 5.3%, 4.5%, 8.2%, 10.6%, 13.5%, 12.1%, 6.8% and 7.3%, with the lowest proportion at age 25~29 and the highest proportion at age 40~44. As for females, 1.4%~9.8% females were obese and the proportion of obese at each age group were 2.0%, 1.4%, 3.0%, 6.9%, 6.1%, 6.6%, 6.5% and 9.8%, with the lowest proportion at age 25~29 and the highest at age 55~59. The relatively high proportion of adults with  $BIM < 18.5$  was seen among age 20~34; the proportion at each age group were 14.4%, 7.5% and 6.2% for males, 24.5%, 28.2% and 17.0% for females, and the proportion of adults in other age groups were lower than 4.5 % for males and 8.5 % for females. Subjects ( $18.5 \leq BMI < 24.0$ ) decreased slightly with age, and subjects ( $24.0 \leq BMI < 28.0$ ) tended to increase as age increased (figure 2-3-1-12 and table 3-3-3-6).

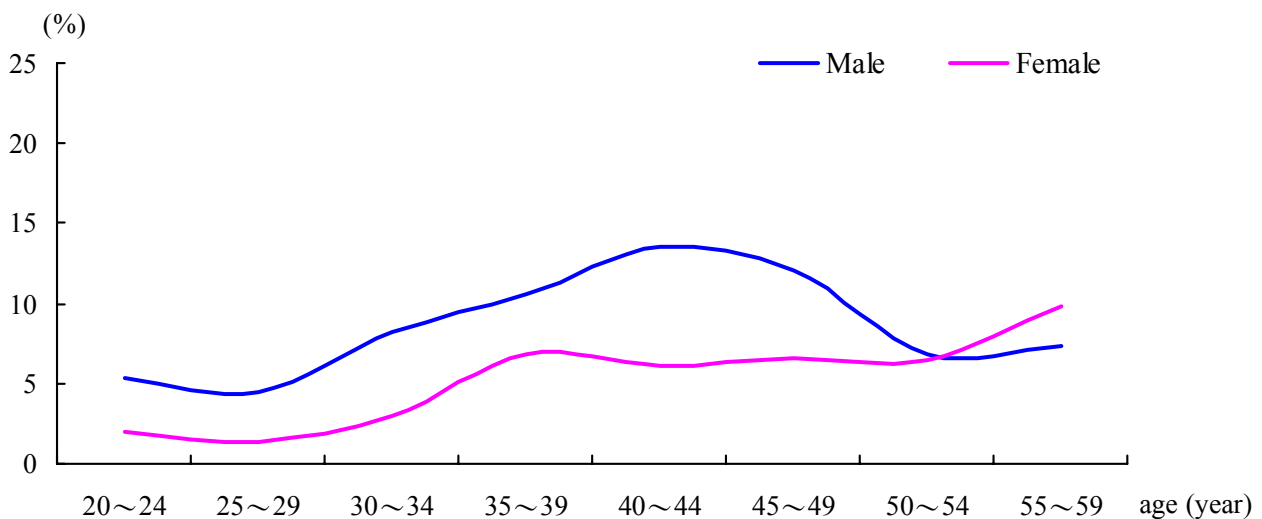


Figure 2-3-1-12 Percentage of obesity in adults

### 3.1.3.3. Circumference indexes

The chest and waist circumferences before age 50 and hip circumferences before age 40 for male increased with age, and remained stable thereafter. Chest, waist and hip circumferences for females increased with age between age 20~59 groups. The average chest, waist and hip circumferences ranged from 88.5~93.8 cm (males) and 80.4~86.7 cm (females), 78.7~86.6 cm (males) and 70.1~81.4 cm (females) and 91.8~94.3cm (males) and 88.7~92.4 cm (females), respectively. Chest, waist and hip circumferences of males were significantly higher than females, but the differences decreased as age increased. The differences between males and females ranged from 5.2~10.6 cm for chest circumference, 4.3~10.5 cm for waist circumference and 0.4~4.5 cm for hip circumference, and the difference was significant ( $P < 0.01$ ) (figure2-3-1-13, figure 2-3-1-14 and figure 2-3-1-15, table 3-3-3-7, table 3-3-3-8, table 3-3-3-9).

The waist-to-hip ratios (WHR) of males and females increased with age, which ranged from 0.855~0.925 (males) and 0.786~0.883 (females). The WHR of males was significantly higher than females ( $P < 0.01$ ), with a difference ranging from 0.042~0.073. This was due to the fairly small difference in hip circumferences between males and females, and a higher waist circumference of males compared to females (table 3-3-3-10 and figure 2-3-1-16).

According to the internationally recognized ACSM (American College of Sports Medicine) standard, a  $WHR \geq 0.94$  for male adults and a  $WHR \geq 0.82$  for female adults indicates too much fat accumulation around the waist, which will result in a higher risk of diseases (hypertension, type-2 diabetes and dyslipidemia, etc.).

Among the 20~59 age groups, 10.2~49.7 % of males had a  $WHR \geq 0.94$  and 27.0~84.8% of females had a  $WHR \geq 0.82$ .

As age increased, there was a higher risk of cardiovascular disease due to the increase in WHR in both males and females. Special attention should be paid to people above the age of 35 as these groups had an increasing proportion of exceeding the WHR standards.

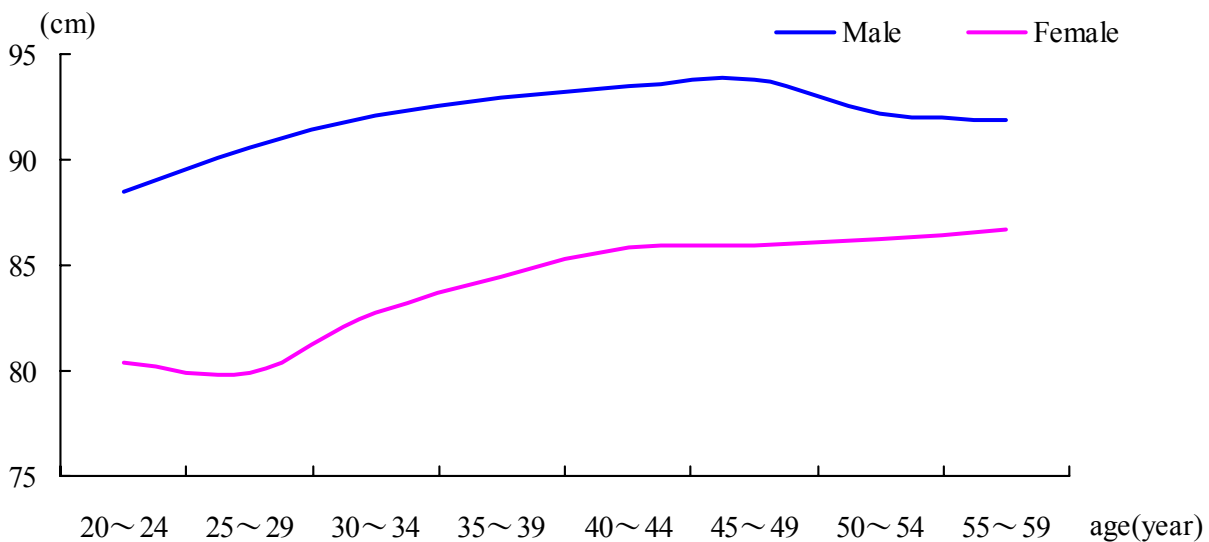


Figure 2-3-1-13 Average chest circumference of adults

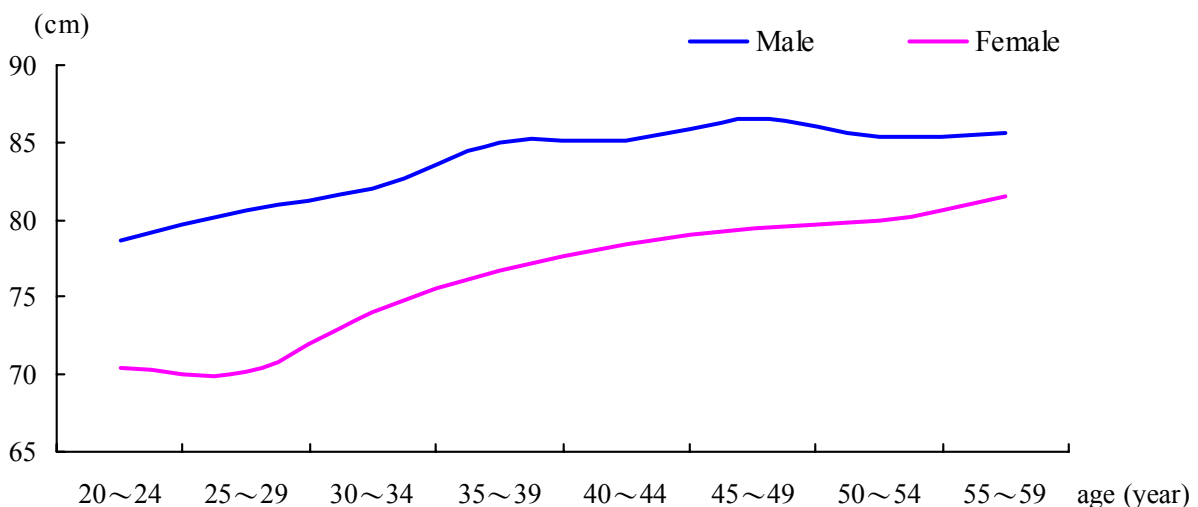


Figure 2-3-1-14 Average waist circumference of adults

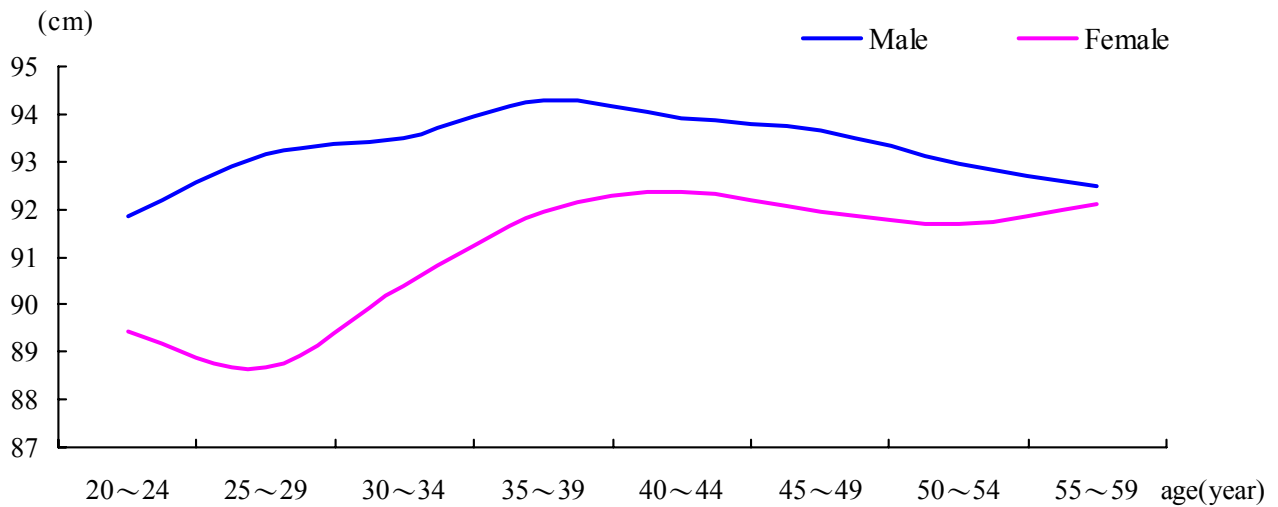


Figure 2-3-1-15 Average hip circumference of adults

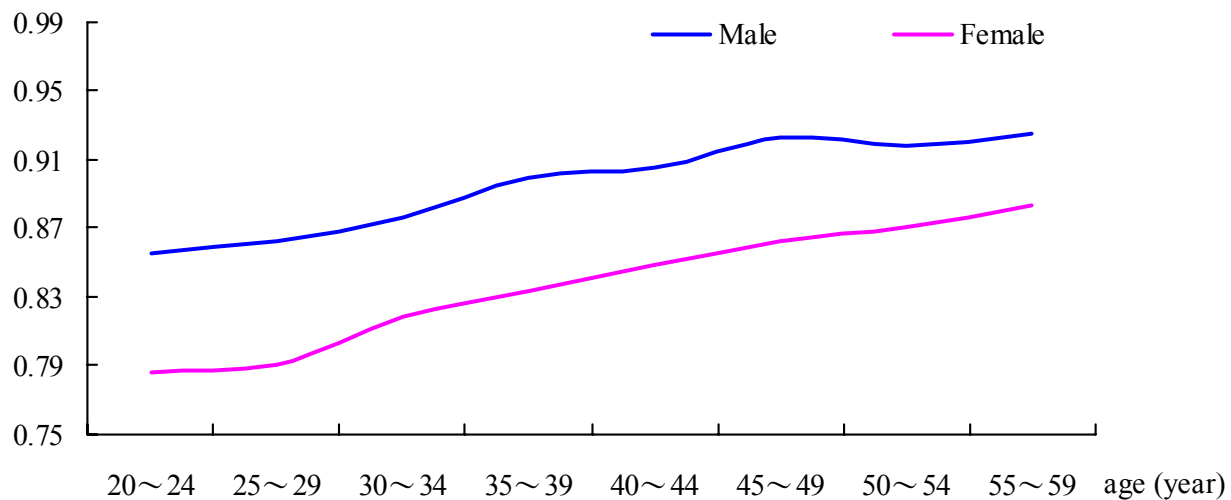


Figure 2-3-1-16 Average waist-hip ratio (WHR) of adults

### 3.1.3.4. Width indexes

Shoulder width of male adults declined with age, while shoulder width of female adults remained relatively stable. The average shoulder width for males and females ranged from 36.9~38.9 cm and 34.4~35.1 cm, respectively. The average shoulder width of males was 2.4~4.4 cm wider than females, with a significant difference among genders ( $P < 0.01$ ) (figure 2-3-1-17 and table 3-3-3-11).

Pelvis width of female adults increased with age, while pelvis width of male adults remained relatively stable. The average pelvis width for males and females were 26.9~27.5 cm and 26.5~28.4 cm, respectively. The average pelvis width of males was significantly larger than females in the 20~29 age groups ( $P < 0.01$ ), and the differences ranged from 0.3~0.7 cm. The average pelvis width of females was significantly larger than males after age 30 and the difference increased as age increased, with a difference ranging from 0.4~1.0 cm (figure 2-3-1-18 and table 3-3-3-12).

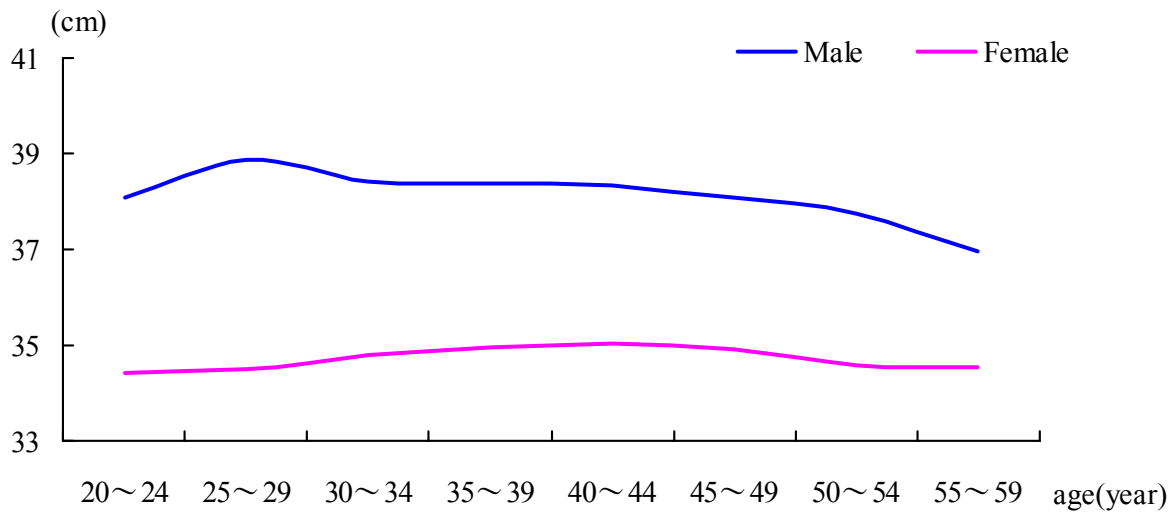


Figure 2-3-1-17 Average shoulder width of adults

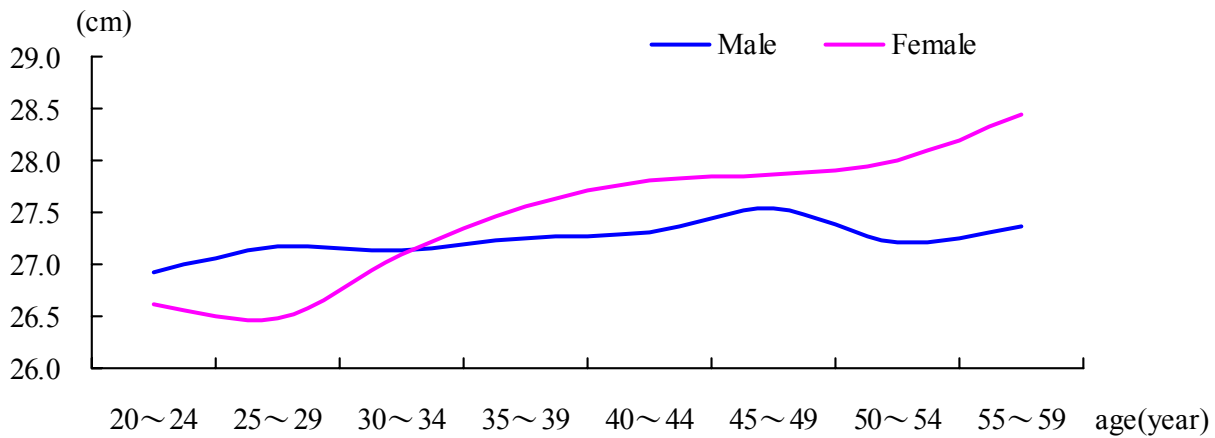


Figure 2-3-1-18 Average pelvis width of adults

### 3.1.3.5. Body composition

Between ages 20~39, the skinfold thickness of upper arm, subscapular and abdominal increased with age in males, then decreased thereafter and remained stable after age 50. For females, the skinfold thickness of the three measuring sites increased with age. Among the three measuring sites of males, abdominal skinfold was the thickest, followed by subscapular skinfold, and upper arm skinfold being the thinnest. For females, abdominal skinfold was the thickest, followed by upper arm skinfold, and subscapular skinfold being the thinnest. The average upper arm, subscapular and abdominal skinfold ranged from 9.1~12.0 mm (males) and 18.7~22.4 mm (females), 14.2~19.5 mm (males) and 14.2~20.0 mm (females), and 19.2~24.3 mm (males) and 20.8~26.8 mm (females), respectively (table 3-3-3-13, table 3-3-3-14 and table 3-3-3-15).

Average skinfold thickness of female of the three measuring sites was significantly higher than males (  $P < 0.01$ ) (except for the subscapular skinfold thickness at age 25~29 and 35~39). The difference in skinfold thickness between males and females tended to increase as age increased. The differences in the upper arm, subscapular and abdominal skinfold thickness between males and females ranged from 8.2~13.3 mm, 0.2~3.5 mm and 0.0~5.2 mm, respectively (figure 2-3-1-19, figure 2-3-1-20 and figure

2-3-1-21).

Percentage body fat of males ranged from 15.9%~19.2%, increased as age increased before age 35~39, and decreased as age increased thereafter. Percentage body fat of females ranged from 22.9%~28.2%, and increased as age increased (table 3-3-3-16 and figure 2-3-1-22).

Lean body mass for male ranged from 53.7~56.0 kg, and reached minimum at age 20~24 and maximum at age 45~49. The lean body mass for females ranged from 38.7~40.8, reached minimum at age 25~29 and maximum at age 40~44 (table 3-3-3-17 and figure 2-3-1-23).

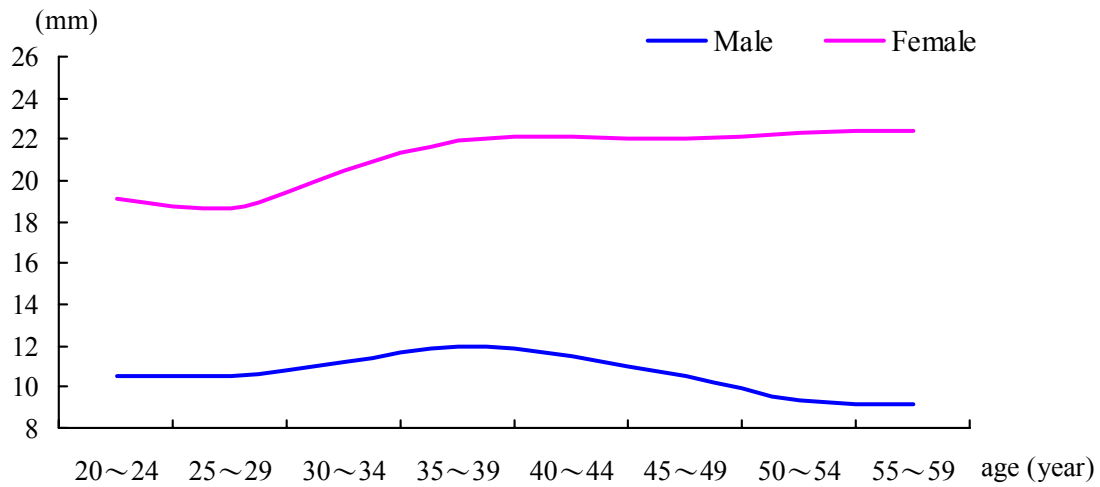


Figure 2-3-1-19 Average upper arm skinfold thickness of adults

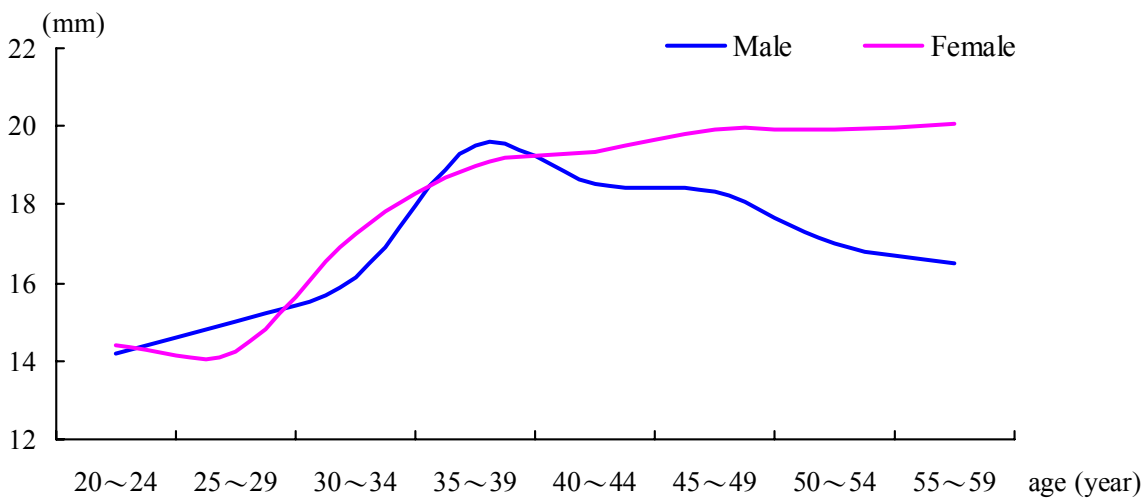


Figure 2-3-1-20 Average subscapular skinfold thickness of adults

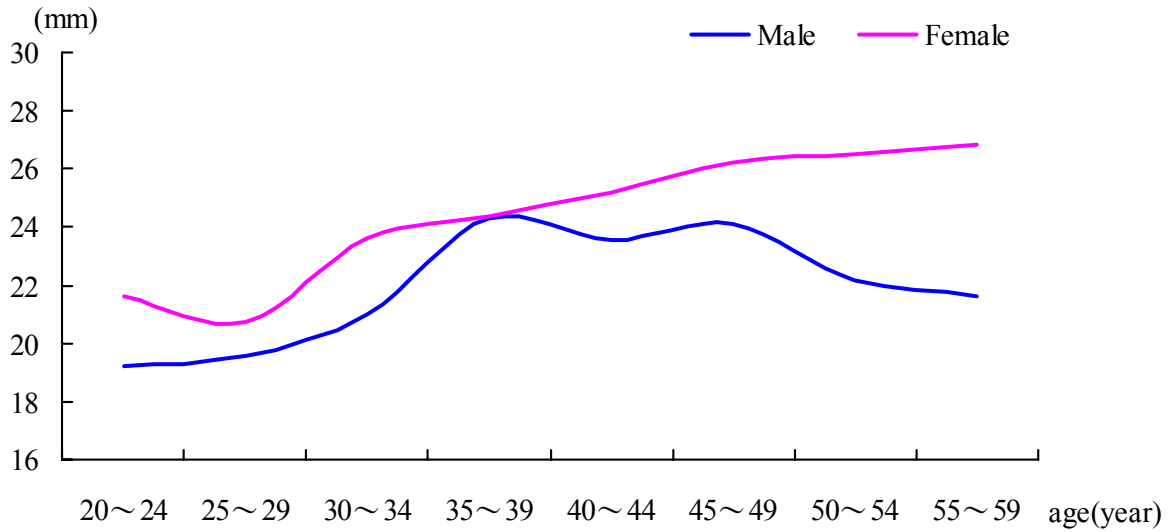


Figure 2-3-1-21 Average abdominal skinfold thickness of adults

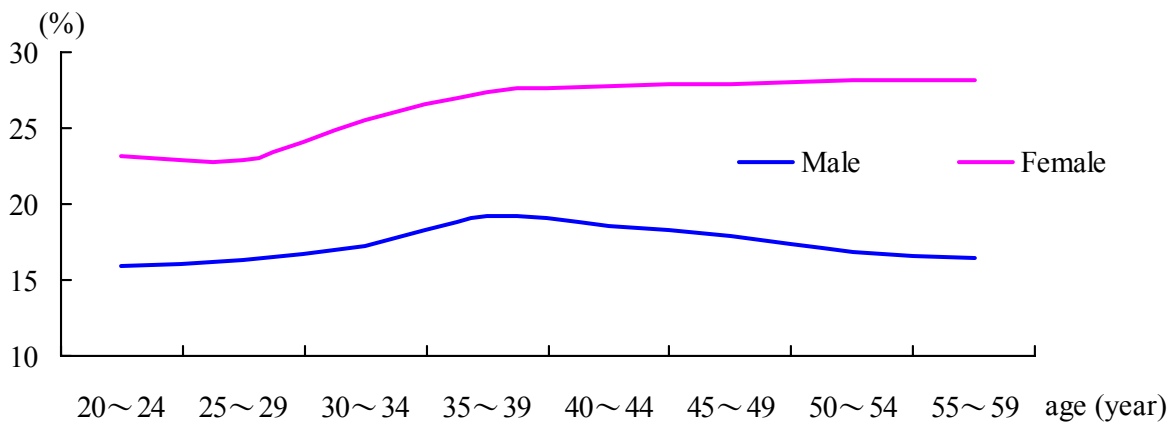


Figure 2-3-1-22 Average percentage body fat of adults

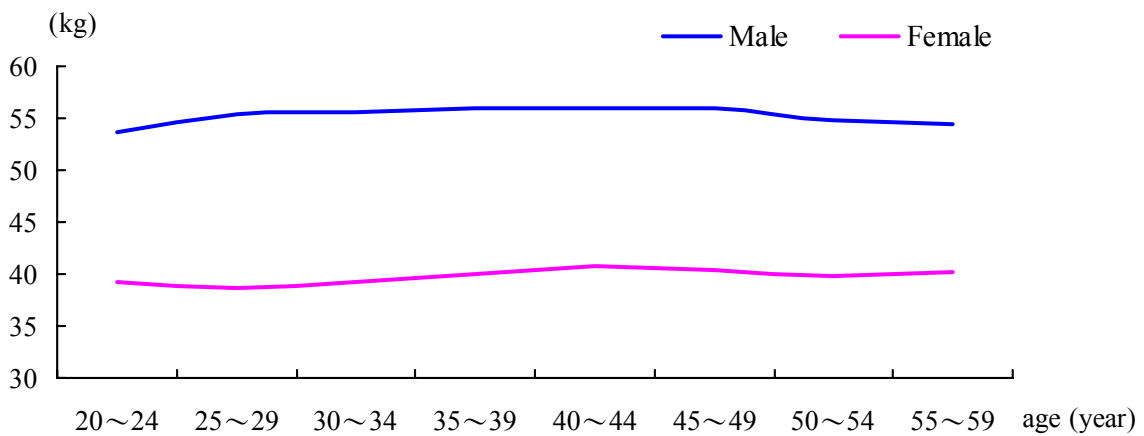


Figure 2-3-1-23 Average lean body mass of adults

### 3.1.4. Physiological Function

Physiological function is reflected by resting pulse, blood pressure (systolic pressure and diastolic pressure), vital capacity and step test index.

#### 3.1.4.1. Resting pulse

The average resting pulses for males and females at age 20~59 were relatively stable as age increased. Resting pulse was 73.6~75.9 times/minute for males and 72.8~76.0 times/minute for females with no difference among genders (table 2-3-1-24 and figure 3-3-4-1).

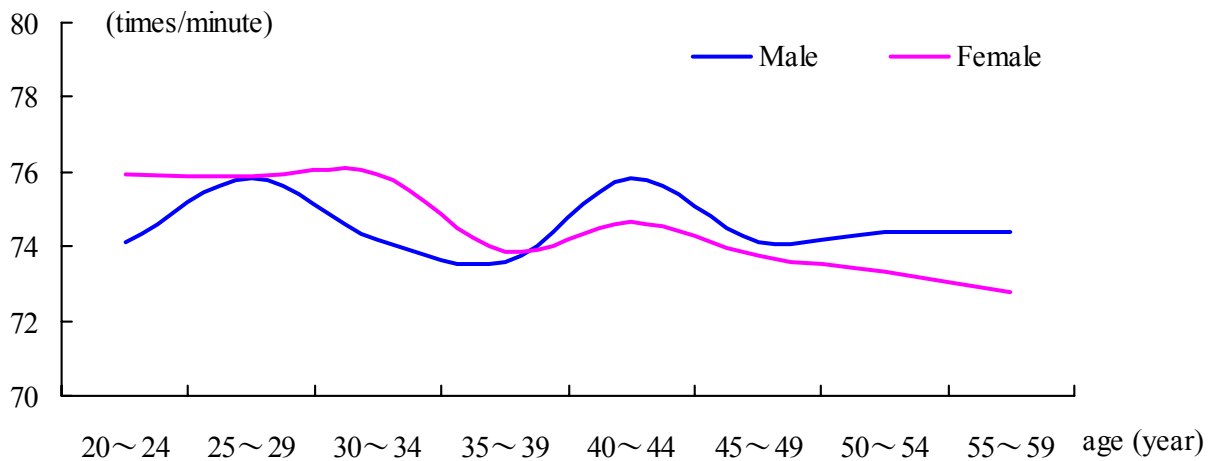


Figure 2-3-1-24 Average resting pulse of adults

#### 3.1.4.2. Blood pressure

In the 20~59 age groups, the average systolic pressure of both males and females tended to increase slowly as age increased. There was no difference in the rate of increase between age groups. The average systolic pressure was 120.1~130.6 mm Hg for males and 109.4~124.9 mmHg for females. The average systolic pressure of males was usually higher than females, and it was significantly higher in the 20~44 age groups (with more than 10 mmHg) ( $P < 0.01$ ) (figure 2-3-1-25 and table 3-3-4-2).

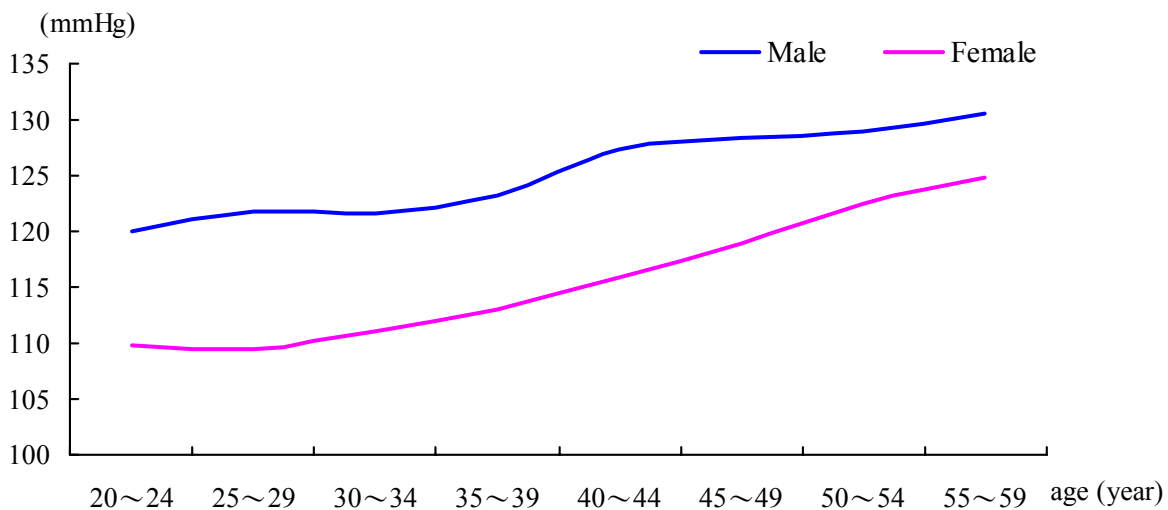


Figure 2-3-1-25 Average systolic pressure of adults



The average diastolic pressure of the 20~59 age groups tended to increase slowly as age increased. The rate of increase between age groups was of no significant difference. The average diastolic pressure was 75.0~81.8 mmHg for males and 68.4~76.8 mmHg for females. The average diastolic pressure of males was significantly higher than that of the females, with about 4.9~7.3 mmHg difference and the difference was significant ( $P < 0.01$ )(figure 2-3-1-26 and table 3-3-4-3).

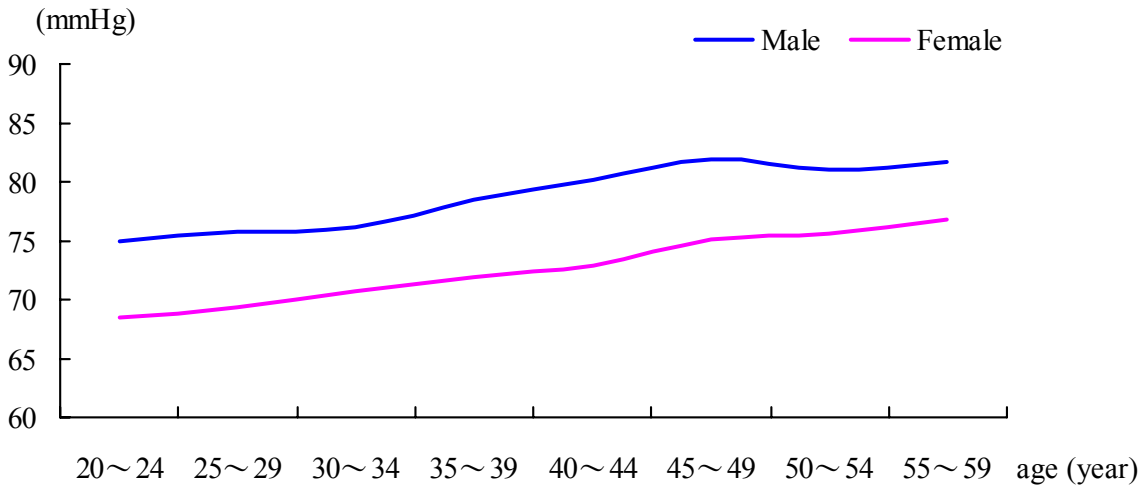


Figure 2-3-1-26 Average diastolic pressure of adults

The average pressure difference of males and females remained fairly stable as age increased before age 45 and the pressure difference increased with age thereafter. The average pressure difference was 44.7~48.9 mmHg for males and 40.1~48.1 mmHg for females. The average pressure difference of males was usually higher than females, particularly at the age of 20~44 and the difference was significant ( $P < 0.05$ ) (figure 2-3-1-27 and table 3-3-4-4).

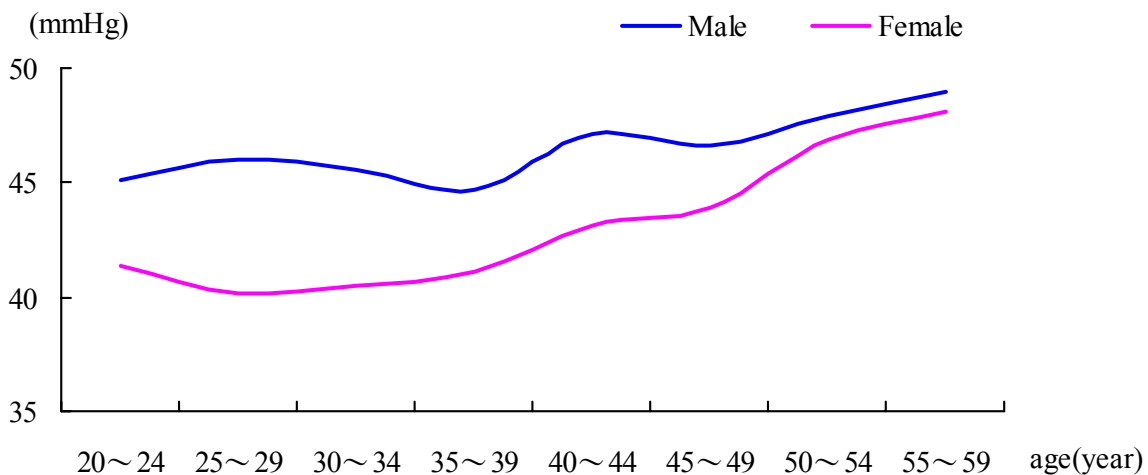


Figure 2-3-1-27 Average pressure difference of adults

3.1.4.3. Vital capacity

The average vital capacity of males at age 30-34 reached the peak and decreased apparently as age increased. The average vital capacity of females at age 20~59 decreased significantly as age increased. The average vital capacity ranged from 3215.9~4008.2 ml for males and 2142.2~2666.9 ml for females. Males has a significantly higher vital capacity than females in all age groups of the adult category, and the difference was more than 1,000 ml ( $P < 0.05$ ) (figure 2-3-1-28 and table 3-3-4-5).

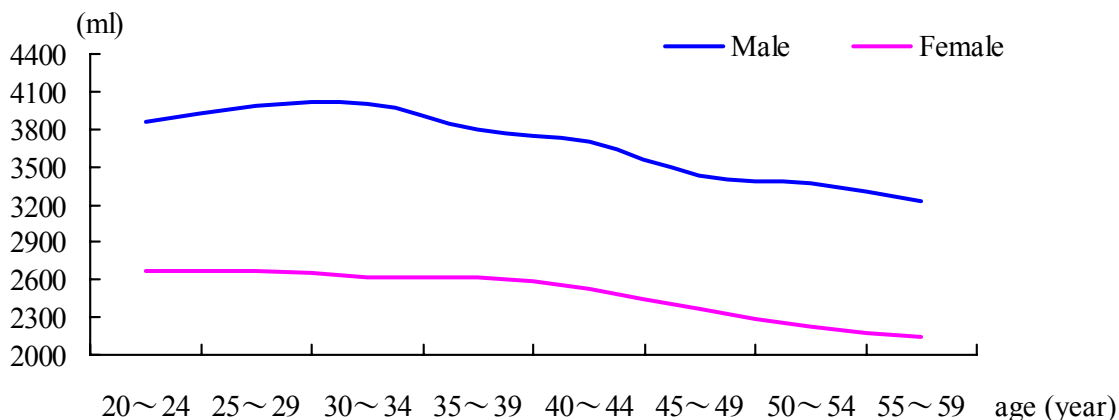


Figure 2-3-1-28 Average vital capacity of adults

The average vital capacity/weight for males and females among 20~59 tended to decrease slowly as age increased. The rate of decrease was of no significant difference between age groups. The average vital capacity/weight was 50.0~60.8 ml/kg for males and 38.8~53.1 ml/kg for females. Males had a higher vital capacity/weight than females, and the difference was significant between males and females ( $P < 0.05$ )(figure 2-3-1-29 and table 3-3-4-6).

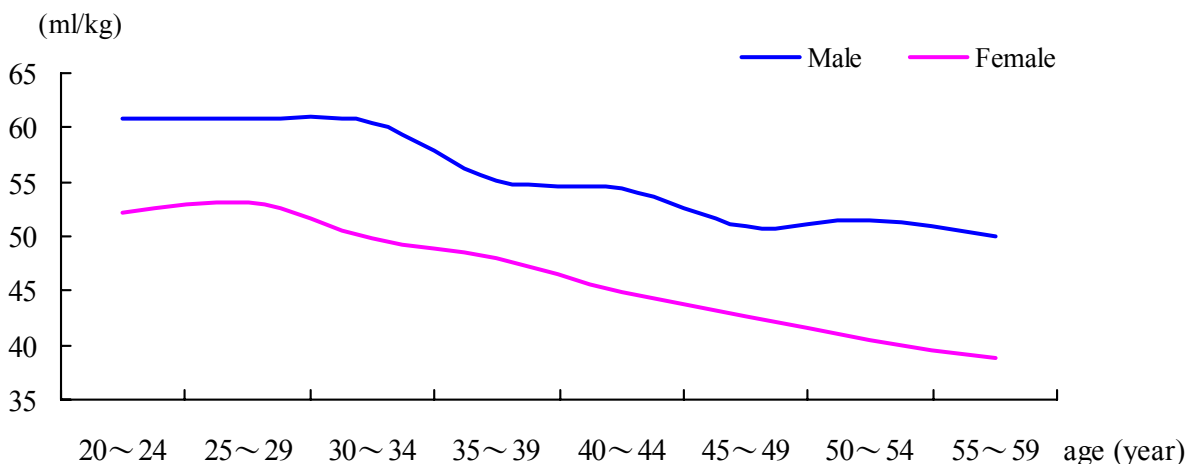


Figure 2-3-1-29 Average vital capacity/weight of adults

#### 3.1.4.4. Step test index

Step test is a simple quantitative load experiment to evaluate cardiovascular function. By observing the relationship between exercising continuously in an established time, the cardiovascular respond and heart rate recovery speed after the exercise (step test index), the cardiovascular function can be assessed.

The average step index of female adults at age 20~54 increased with age, while that of male adults remained fairly stable at age 20~29 and decreased slightly at age 30~54, and the average step index of both male and female adults gradually decreased after age 55. The average step test index ranged from 53.0~58.3 for males and 54.1~62.6 for females. The step test index was slightly higher in females than males except in the 20~24 year age group and no significant gender difference was seen in other age groups ( $P < 0.05$ ) (figure 2-3-1-30 and table 3-3-4-7).

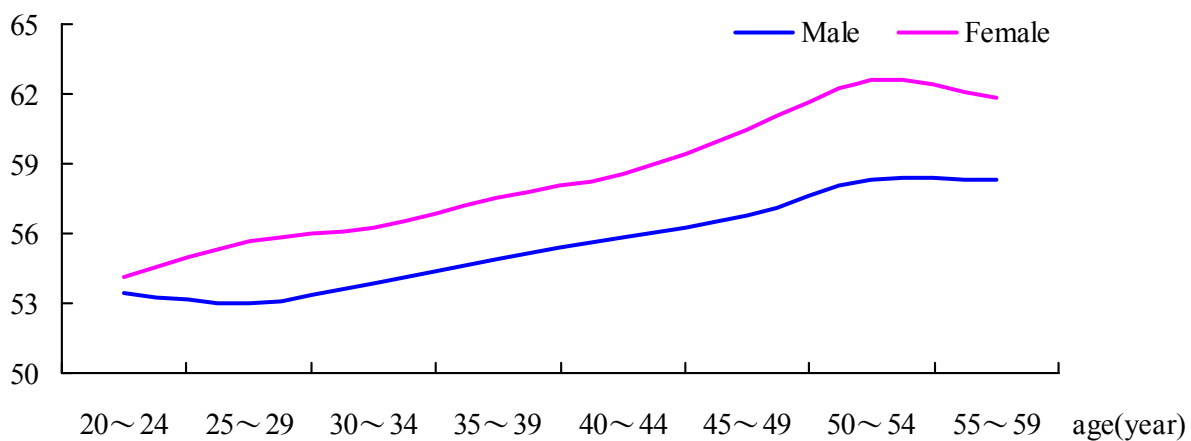


Figure 2-3-1-30 Average step index of adults

### 3.1.5. Physical Fitness

#### 3.1.5.1. Strength

Strength was reflected by four different indexes - vertical jump, push-ups (male)/ one-minute sit-ups (female), grip strength and back strength for age groups between 20~39 years old. For 40 years old and above, grip strength was used to reflected strength.

The indexes for vertical jump and push-ups (male) reached maximum at age 25~29, one-minute sit-ups (female) reached maximum at age 20~24, a decreasing trend with advanced age was observed. Grip strength for both males and females increased with age, however tended to decline thereafter as subjects aged. The indexes for grip strength increased first and then decreased with age. Grip strength and back strength reached maximum at age 35~39 for males and at 40~44 for females. The average back strength increased with age for both males and females and reached a maximum at age 35~39 for males. The indexes for vertical jump, push-ups, grip and back strength in males ranged from 35.8~38.8 cm, 23.5~25.8 times, 38.6~42.9 kg and 103.6~109.0 kg, respectively. For females, the indexes for vertical jump, sit-ups, grip and back strength ranged from 22.6~24.3 cm, 17.0~23.6 times/minute, 21.5~24.0 kg and 55.2~58.4 kg, respectively (figure 2-3-1-31, figure 2-3-1-32, figure 2-3-1-33, figure 2-3-1-34, table

3-3-5-1, table 3-3-5-2, table 3-3-5-3 and table 3-3-5-4).

The strength of males was significantly larger than females ( $P < 0.05$ ) where the strength of females was 60% of males.

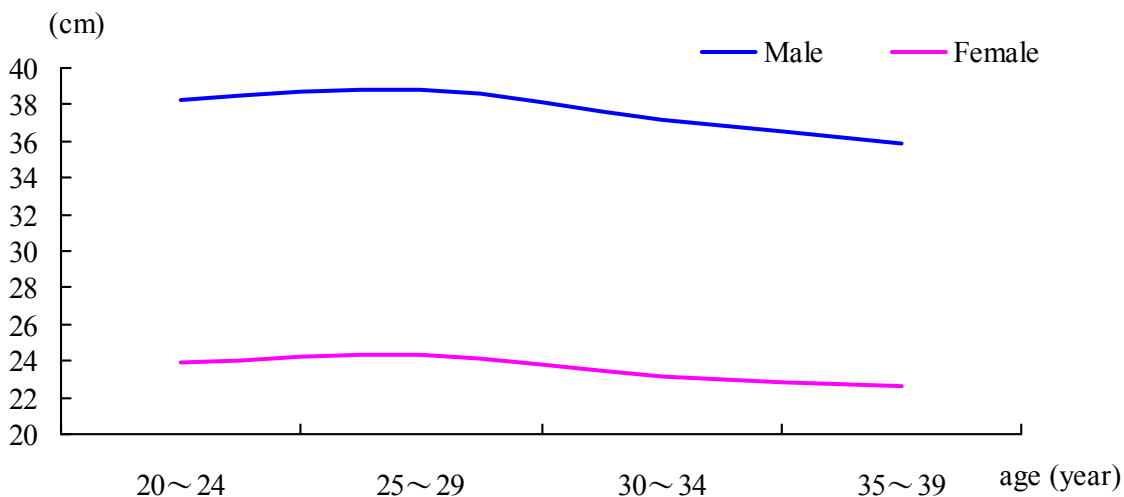


Figure 2-3-1-31 Average vertical jump of adults

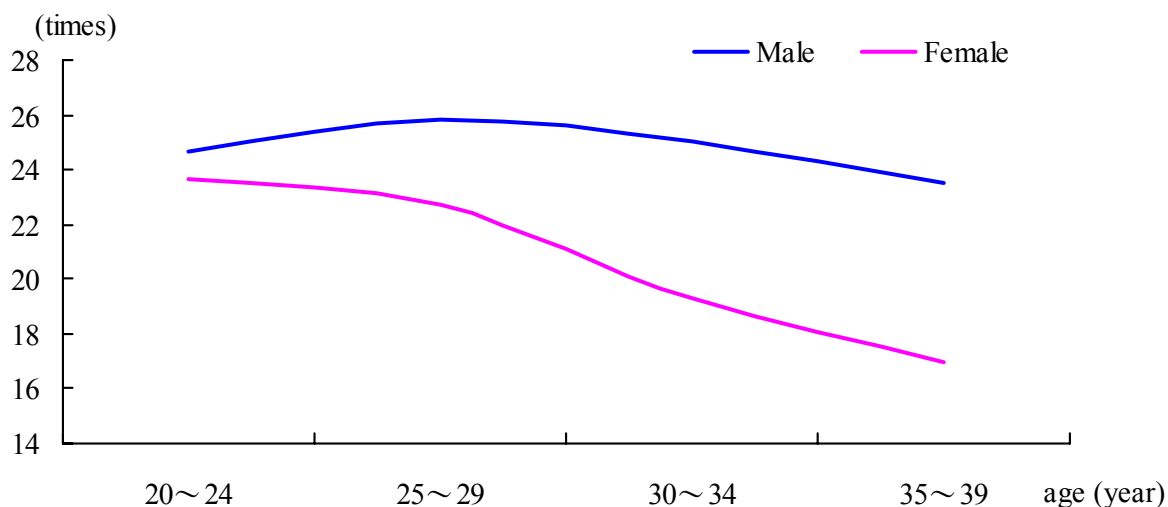


Figure 2-3-1-32 Average push-ups (male)/ One-minute sit-ups (female) of adults

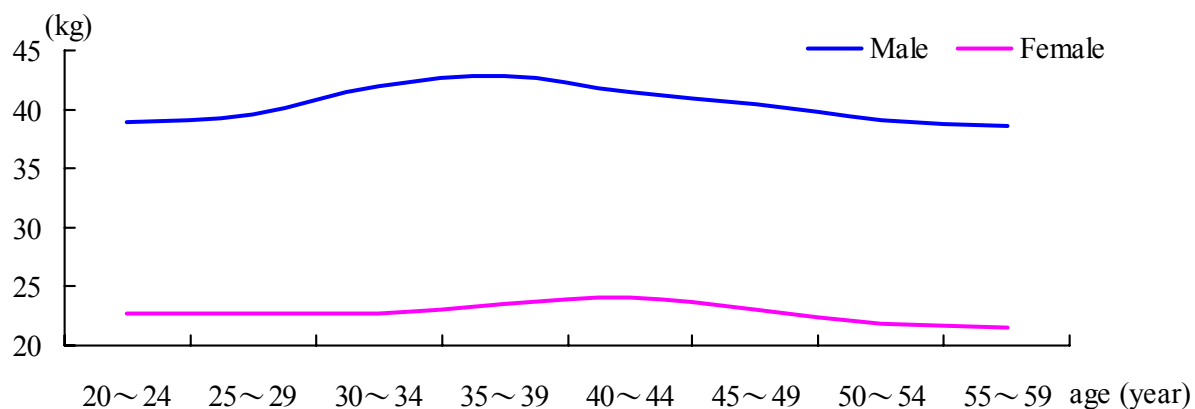


Figure 2-3-1-33 Average grip strength of adults

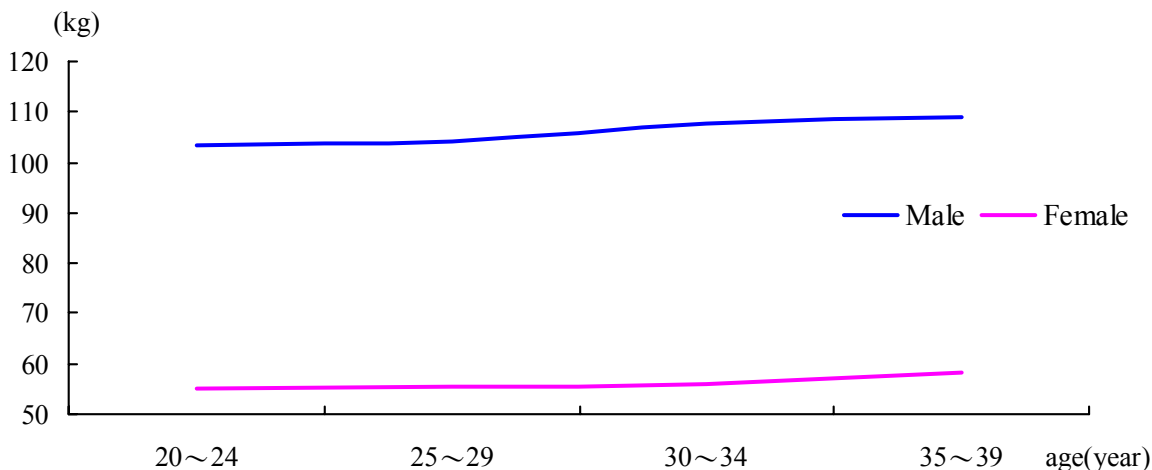


Figure 2-3-1-34 Average back strength of adults

### 3.1.5.2. Flexibility

Sit and reach was used to reflect flexibility.

Between ages 20~59, the average sit and reach for males decreased 3-fold from 3.2 cm to 1.0 cm, indicating that flexibility declined in male adults as age increased. The decline of flexibility mainly appeared after age 50 with a relatively rapid decline. However, the difference seen between age 20~49 was not significantly different. As for females, flexibility index fluctuated between 4.8~6.4 cm and there was no significant different between age groups, indicating that flexibility did not vary during adulthood in females (table 3-3-5-5).

Flexibility is significantly higher in females than males ( $P < 0.05$ ), where the biggest difference (5.3 cm) occurred in the 55~59 year age group. Flexibility of females was obviously better than males (figure 2-3-1-35).

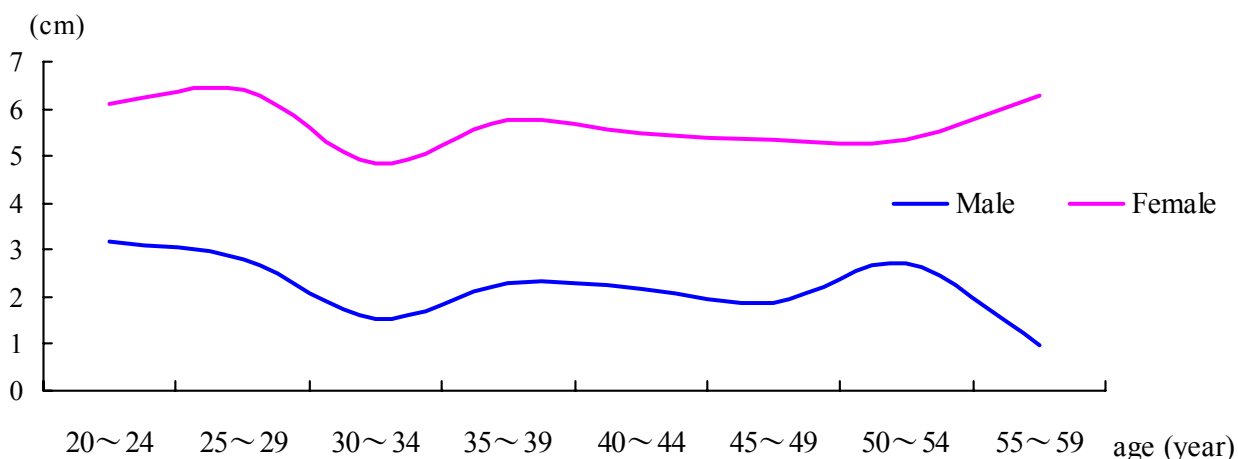


Figure 2-3-1-35 Average sit and reach of adults

3.1.5.3. Respond

Selective respond time was used to reflect response ability.

Adults had the fastest respond time at 25~29 year age group in males and at 20~24 year age group in females, whereas both male and females had the slowest respond time at age 55~59. This showed that response ability decreased as age increased. The average respond time for males and females ranged from 0.41~0.47 seconds and 0.43~0.51 seconds, respectively (table 3-3-5-6). Compared with the same age group, males had a significantly shorter respond time than females, with a difference of 0.03 second ( $P < 0.05$ ). The rate of decrease in respond time with age was generally the same for both males and females (figure 2-3-1-36).

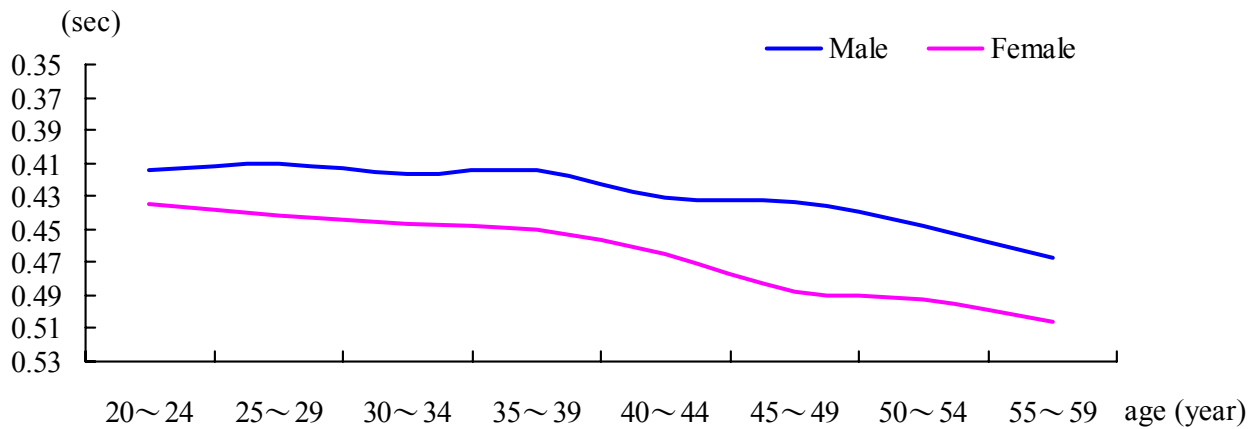


Figure 2-3-1-36 Average selective respond time of adults

3.1.5.4. Balance

One foot stands with eyes closed (OFSEC) was used to test balance ability.

For both males and females, the 25~29 year age group had the longest balance time, whereas the 55~59 year age group had the shortest time, reflecting that balance ability decreased with age. The average OFSEC ranged from 18.8~44.3 seconds for males and 13.0~47.8 seconds for females (table 3-3-5-7). After age 45 of the same age group, males had a better balance ability than females, but the difference was insignificant (figure 2-3-1-37).

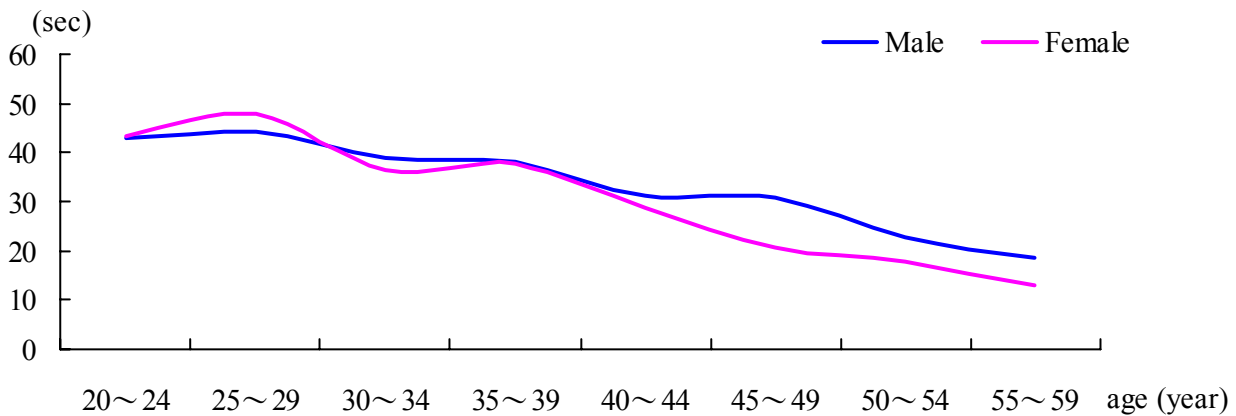


Figure 2-3-1-37 Average time of one foot stands with eyes closed of adults

### 3.2. Comparison of 2005 and 2010 Results on the Physical Fitness Study of Macao Adults

#### 3.2.1. Comparison of Basic Information of the Subjects

In 2010, the total number of adult subjects was 3540 which was less than the number of subjects in 2005 which was 3608. There were 32 selected institutions, an increase of 2 sampling sites from 2005. More samples were drawn from Macao government institutions and fewer samples were drawn from private institutions compared with the samples in 2005. The proportion of adults born in Mainland China decreased and those born in Macao increased compared with the results in 2005. In terms of educational level, the proportion of adults who possessed an associate or university degree increased significantly, those with master and doctoral education increased to some extent; concurrently, the proportion with secondary education or under decreased to an apparent extent. In working environment, there was an obvious increase in the proportion of adults working in an “air conditioned” environment, and those working outdoors in a “naturally ventilated” environment decreased significantly. In terms of working hours, the proportion of adults working 35~40 hours and 40~50 hours per week increased, those working for over 50 hours per week decreased significantly, and the proportion of “non-working” females decreased dramatically (table 2-3-2-1, table 2-3-2-2, table 2-3-2-3 and table 2-3-2-4).

Table 2-3-2-1 Comparison of birthplaces in adults (%)

Birthplace	M			F		
	2005	2010	Difference	2005	2010	Difference
Mainland China	40.1	32.3	-7.8	46.5	41.0	-5.5
Macao	50.3	57.0	6.7	45.3	51.2	5.9
Hong Kong	3.4	5.5	2.1	3.5	3.2	-0.3
Portugal	0.3	0.8	0.5	0.3	0.7	0.4
Others	5.9	4.3	-1.6	4.4	3.9	-0.5

Note: difference equaled to the data in 2010 minus the data in 2005.

**Table 2-3-2-2 Comparison of educational level in adults (%)**

Educational level	M			F		
	2005	2010	Difference	2005	2010	Difference
Below primary school education level	2.7	3.1	0.4	5.4	3.3	-2.1
Primary school	19.8	11.5	-8.3	21.1	13.7	-7.4
Secondary school	44.5	39.4	-5.1	39.3	35.7	-3.6
University	27.8	37.6	9.8	30.4	38.8	8.4
Master	5.0	7.9	2.9	3.8	8.2	4.4
Doctoral	0.2	0.4	0.2	0.0	0.3	0.3

**Table 2-3-2-3 Comparison of working environments in adults (%)**

Working environment	M			F		
	2005	2010	Difference	2005	2010	Difference
Outdoors	23.3	19.1	-4.2	4.6	2.5	-2.1
“Naturally ventilated” indoors	23.6	17.9	-5.7	34.0	23.7	-10.3
“air conditioned” indoors	53.1	63.0	9.9	61.4	73.8	12.4

**Table 2-3-2-4 Comparison of working hours in adults (%)**

Working hours	M			F		
	2005	2010	Difference	2005	2010	Difference
Not working	4.8	3.7	-1.1	19.2	4.6	-14.6
Less than 20 hours	3.5	3.3	-0.2	5.0	8.9	3.9
20~35 hours	5.7	4.9	-0.8	7.2	9.3	2.1
35~40 hours	33.7	40.9	7.2	22.3	31.9	9.6
40~50 hours	34.2	41.5	7.3	31.3	37.4	6.1
50 hours or more	18.2	5.6	-12.6	14.9	7.9	-7.0

### 3.2.2. Comparison of Lifestyle

#### 3.2.2.1. Habits

Compared with the results in 2005, the sleeping hours of adults decreased slightly as well as a decreasing trend in the quality of sleep of male and female adults (table 2-3-2-5). Compared with the results in 2005, the proportion of adults with daily walking hours less than 30 minutes increased significantly, and those with accumulative sitting hours over 6 hours has also increased. The proportion of adults doing physical exercise during their leisure time had increased, and the proportion of those choosing “audio-visual entertainment” had decreased (table 2-3-2-6, table 2-3-2-7, table 2-3-2-8).



**Table 2-3-2-5 Comparison of sleeping hours and quality of sleep in adults (%)**

Sleeping hours and quality	M			F		
	2005	2010	Difference	2005	2010	Difference
Less than 6 hours	11.9	13.6	1.7	14.5	16.4	1.9
6~9 hours	84.6	83.5	-1.1	81.9	80.5	-1.4
9 hours or more	3.5	2.9	-0.6	3.6	3.1	-0.5
Poor quality of sleep	6.6	9.7	3.1	11.9	13.6	1.7
Normal quality of sleep	64.1	69.1	5	65.6	67.8	2.2
Good quality of sleep	29.3	21.1	-8.2	22.4	18.6	-3.8

**Table 2-3-2-6 Comparison of daily walking hours in adults (%)**

Walking hours	M			F		
	2005	2010	Difference	2005	2010	Difference
Less than 30 minutes	35.5	47.1	11.6	36.5	47.7	11.2
30~60 minutes	37.9	32.3	-5.6	30.8	30.6	-0.2
1~2 hours	13.4	10.4	-3.0	15.4	10.5	-4.9
2 hours or more	13.3	10.3	-3.0	17.3	11.2	-6.1

**Table 2-3-2-7 Comparison of daily sitting hours in adults (%)**

Daily sitting hours	M			F		
	2005	2010	Difference	2005	2010	Difference
Less than 3 hours	16.4	17.6	1.2	16.3	15.1	-1.2
3~6 hours	40.8	39.1	-1.7	39.8	36.3	-3.5
6~9 hours	26.4	25.5	-0.9	24.4	26.8	2.4
9~12 hours	12.5	13.6	1.1	14.6	16.7	2.1
12 hours or more	4.0	4.2	0.2	4.9	5.2	0.3

**Table 2-3-2-8 Comparison of activities during leisure time in adults (%)**

Activities during leisure time	M			F		
	2005	2010	Difference	2005	2010	Difference
Physical exercise	36.5	49.1	12.6	25.7	30.1	4.4
Chess or poker	8.8	7.1	-1.7	3.4	3.8	0.4
Traveling	28.6	27.6	-1.0	16.5	17.9	1.4
Social gathering	28.5	32.6	4.1	30.6	39.4	8.8
Audio-visual entertainment	68.3	65.2	-3.1	67.0	63.3	-3.7
House chores	26.6	27.7	1.1	63.5	56.4	-7.1
Sleeping	29.6	30.9	1.3	34.1	35.3	1.2
Others	13.8	16.0	2.2	12.2	16.1	3.9

Compared with the results in 2005, the proportion of those who never smoked increased and the increase in males was greater than that in females. No significant change was found in smoking quantity and the proportion of those quitting smoking. Among smokers, the proportion of males who had smoked for over 10 years increased slightly, and females who had smoked for less than 5 years decreased

significantly, those who had smoked over 15 years increased significantly, which showed that a good number of females had long-term smoking habit (table 2-3-2-9 and table 2-3-2-10).

**Table 2-3-2-9 Comparison of cigarette consumption in adults (%)**

Cigarette consumption	M			F		
	2005	2010	Difference	2005	2010	Difference
None	65.7	71.7	6.0	94.9	96.2	1.3
Less than 10 cigarettes per day	12.8	8.1	-4.7	3.1	2.1	-1.0
10~20 cigarettes per day	10.8	10.1	-0.7	1.0	0.7	-0.3
Over 20 cigarettes per day	3.9	2.6	-1.3	0.2	0.1	-0.1
Quitted smoking for less than 2 years	1.7	1.8	0.1	0.1	0.4	0.3
Quitted smoking for more than 2 years	5.2	5.7	0.5	0.6	0.6	0.0

**Table 2-3-2-10 Comparison of smoking duration in adults (%)**

Smoking years	M			F		
	2005	2010	Difference	2005	2010	Difference
Less than 5 years	19.4	17.2	-2.2	42.7	27.6	-15.1
5~10 years	19.6	17.4	-2.2	27.2	31.6	4.4
10~15 years	17.9	20.1	2.2	21.4	15.8	-5.6
15 years or more	43.0	45.3	2.3	8.7	25.0	16.3

Compared with the results in 2005, the proportion of adult drinking alcohol increased in 2010. In terms of drinking frequency, an increased was seen in the proportion of males who drank once a month, the proportion of those who drank 3 times a week decreased, and the frequency of drinking for females increased. In terms of types of alcohol, the proportion of adults choosing liquor, wine or fruit wine and mixed alcohol increased significantly, and those drinking beer decreased dramatically (table 2-3-2-11 and table 2-3-2-12).

**Table 2-3-2-11 Comparison of drinking frequency in adults (%)**

Drinking frequency	M			F		
	2005	2010	Difference	2005	2010	Difference
Non-drinker	51.7	47.6	-4.1	82.3	80.2	-2.1
Drinker	48.3	52.4	4.1	17.7	19.8	2.1
1 time/month	43.9	48.2	4.3	71.2	67.9	-3.3
1~2 times/week	34.0	34.4	0.4	20.7	21.3	0.6
3~4 times/week	12.1	9.2	-2.9	4.5	5.6	1.1
5~7 times/week	10.0	8.2	-1.8	3.6	5.1	1.5

Table 2-3-2-12 Comparison of alcohol preference in adults (%)

Types of alcohol	M			F		
	2005	2010	Difference	2005	2010	Difference
Liquor	1.4	6.5	5.1	2.0	4.6	2.6
Beer	72.1	56.0	-16.1	53.9	25.6	-28.3
Yellow wine	0.4	0.5	0.1	0.8	0.3	-0.5
Rice wine	3.5	1.7	-1.8	2.2	1.5	-0.7
Wine or fruit wine	16.9	24.2	7.3	33.8	50.8	17.0
Mixed	5.6	11.1	5.5	7.3	17.2	9.9

3.2.2.2. Physical exercise

In 2010, 15.5 % adults participated in physical exercise frequently, which was higher than 2005 (13.6 %). There was a slight increase in the proportion of adults who participated in physical exercise occasionally, a decrease in the proportion of those who never participated in physical exercise was seen, which indicated that there was an improvement in the popularity and promotion of sports for all in Macao.

Compared with the results of adults participating in physical exercise in 2005, there was a significant increase in the proportion of adults who participated in physical exercise for 1~2 times a week, an increase in the proportion of those who participated in physical exercise for 60 minutes or more, a decrease in the proportion of those who participated in physical exercise for less than 30 minutes. For adults with an exercise intensity of “rapid breathing and increased heart rate and perspiring greatly”, the proportion increased significantly in males and no change was seen in females. The proportion of those who persisted to continual exercising for less than 6 months increased, and a decrease was seen in the proportion of those who persisted to continual exercising for 1-5 years. Except for the main exercise purposes of “preventing and curing diseases”, “improving exercise ability” and “relieving pressure and regulating mood”, more males chose “losing weight and keeping fit” and “socializing” than “preventing and curing diseases”, and no change was found in females. For exercise locations, the proportion of those choosing stadium or gym to exercise increased significantly. For those choosing ball games as their first choice, there were differences between males and females. The proportion of males choosing “Badminton” and “others” increased while choosing “Basketball” and others as top choices decreased. For females, the proportion of those choosing “Badminton” and “tennis” as top choices decreased, and those choosing “others” increased. In terms of main obstacles affecting adults to participate in physical exercise, except for “no time” as the main obstacle, an increase was seen in the proportion of non-participants due to “laziness” in males and females (table 2-3-2-13, table 2-3-2-14, table 2-3-2-15, table 2-3-2-16, table 2-3-2-17, table 2-3-2-18 and table 2-3-2-19).

**Table 2-3-2-13 Comparison of exercise frequency per week in adults (%)**

Frequency of exercise	M			F		
	2005	2010	Difference	2005	2010	Difference
Never	32.5	23.6	-8.9	39.4	35.8	-3.6
Less than 1 time	17.7	19.3	1.6	17.8	19.7	1.9
1~2 times	25.1	30.2	5.1	18.6	21.3	2.7
3~4 times	13.7	16.1	2.4	11.5	11.4	-0.1
5 times or more	11.0	10.8	-0.2	12.6	11.8	-0.8

**Table 2-3-2-14 Comparison of exercise duration and self-perception in adults (%)**

Exercise duration and self-perception	M			F		
	2005	2010	Difference	2005	2010	Difference
Less than 30 minutes	34.6	33.3	-1.3	41.7	35.5	-6.2
30~60 minutes	47.2	40.9	-6.3	42.3	44.8	2.5
60 minutes or more	18.2	25.8	7.6	16.0	19.7	3.7
Breathing & heart rate remained almost the same	17.6	14.0	-3.6	20.3	19.1	-1.2
Slight increase in breathing & heart rate and perspiring slightly	54.7	46.6	-8.1	61.1	61.8	0.7
Rapid breathing & increased heart rate and perspiring greatly	27.7	39.3	11.6	18.6	19.1	0.5

**Table 2-3-2-15 Comparison of duration of persistent exercising in adults (%)**

Duration of persistent exercising	M			F		
	2005	2010	Difference	2005	2010	Difference
Less than 6 months	28.5	34.5	6.0	39.6	42.2	2.6
6~12 months	12.9	12.0	-0.9	13.2	13.1	-0.1
1~3 years	14.7	12.5	-2.2	18.2	16.4	-1.8
3~5 years	9.8	6.1	-3.7	9.4	7.6	-1.8
5 years or more	34.1	34.8	0.7	19.6	20.7	1.1

**Table 2-3-2-16 Comparison of exercise purposes in adults (%)**

Exercise purposes	M			F		
	2005	2010	Difference	2005	2010	Difference
Prevent and cure diseases	58.6	56.1	-2.5	65.7	66.9	1.2
Improve exercise ability	61.9	62.0	0.1	41.0	44.0	3
Lose weight and keep fit	20.9	32.6	11.7	44.9	47.8	2.9
Relieve pressure and regulate mood	54.1	55.5	1.4	49.7	56.7	7
Socializing	13.9	18.1	4.2	12.2	12.2	0
Others	12.9	11.7	-1.2	9.0	9.2	0.2

**Table 2-3-2-17 Comparison of exercise locations in adults (%)**

Exercise locations	M			F		
	2005	2010	Difference	2005	2010	Difference
stadium or gym	38.8	55.0	16.2	27.1	43.7	16.6
Park	44.8	49.1	4.3	58.1	54.9	-3.2
Office or residential area	11.7	11.8	0.1	21.0	19.1	-1.9
Open ground	24.1	25.4	1.3	19.4	18.9	-0.5
Road or street	25.6	23.4	-2.2	12.5	12.5	0.0
Recreation club	10.3	13.2	2.9	11.0	10.7	-0.3
Others	15.4	9.0	-6.4	10.7	10.3	-0.4

**Table 2-3-2-18 Comparison of ball games participation in adults (%)**

Ball games	M			F		
	2005	2010	Difference	2005	2010	Difference
Basketball	23.3	18.8	-4.5	10.7	10.6	-0.1
Volleyball	2.1	0.9	-1.2	5.4	3.5	-1.9
Football	25.4	25.0	-0.4	0.8	0.4	-0.4
Table tennis	17.9	16.4	-1.5	19.8	19.8	0
Badminton	17.1	19.4	2.3	50.0	43.8	-6.2
Tennis	6.9	5.1	-1.8	11.0	5.9	-5.1
Golf	0.7	0.3	-0.4	0.8	1.3	0.5
Billiards	6.2	6.1	-0.1	0.8	1.1	0.3
Others	0.3	7.8	7.5	0.6	13.6	13

**Table 2-3-2-19 Comparison of obstacles to participating in physical exercise in adults (%)**

Obstacles to participating physical exercise	M			F		
	2005	2010	Difference	2005	2010	Difference
No interest	11.6	13.0	1.4	15.4	15	-0.4
Laziness	40.9	53.9	13	47.8	56.9	9.1
Not necessary to exercise	3.2	2.6	-0.6	1.8	1.0	-0.8
Too weak	3.0	3.4	0.4	4.6	6.6	2.0
Too much labour intensive work	12.1	8.0	-4.1	6.8	7.4	0.6
Lack of time	53.0	60.4	7.4	54.8	64.3	9.5
Lack of locations and facilities	21.8	25.3	3.5	15.7	17.2	1.5
Lack of guidance	8.7	8.7	0.0	10.1	12.1	2.0
Lack of organization	9.6	13.4	3.8	8.4	9.5	1.1
Lack of money	2.8	2.5	-0.3	2.2	2.1	-0.1
Embarrassment	0.8	0.9	0.1	0.8	0.4	-0.4
Others	13.0	8.9	-4.1	13.5	8.8	-4.7

**3.2.2.3. Occurrence of diseases and understanding of the physical fitness test**

Among the adult samples of 2010 study, 28.8 % of them were diagnosed with diseases in the past five years, which was lower than the proportion of 31.8 % in 2005, and the proportion of those diagnosed with diseases tended to increase for both male and female adults as age increased. In terms of the types of diseases, a significant increase was found in the proportion of “hypertension” and “diabetes”, and a decrease was found in the proportion of “digestive diseases” and “accidental injury”. The differences between genders were displayed by the increase in the proportion of “urinary or reproductive diseases” in males and the increase in the proportion of “cancers” in females (table 2-3-2-20).

**Table 2-3-2-20 Comparison of diseases in adults (%)**

Types of diseases	M			F		
	2005	2010	Difference	2005	2010	Difference
Cancer	4.5	2.9	-1.6	7.6	14.1	6.5
Cardiovascular	7.3	7.4	0.1	6.0	4.1	-1.9
Respiratory	19.3	18.8	-0.5	16.7	15.7	-1
Accidental injury	16.7	11.0	-5.7	11.9	5.8	-6.1
Digestive	27.0	21.9	-5.1	27.8	20.7	-7.1
Hypertension	23.0	32.6	9.6	24.6	25.7	1.1
Endocrine	3.2	1.0	-2.2	7.2	7.8	0.6
Urinary or reproductive	6.0	9.0	3.0	8.5	8.1	-0.4
Diabetes	4.9	7.9	3.0	4.2	6.5	2.3
Others	21.0	22.9	1.9	21.2	26.0	4.8

Compared with the results in 2005, a significant increase was seen in the proportion of adults who had heard of and participated in the physical fitness study, which showed that Macao citizens were familiar with and recognized the physical fitness study. In terms of understanding of the physical fitness study, more adults considered it helpful to improve scientific knowledge of doing exercises and to recognize the importance of physical exercise (table 2-3-2-21 and table 2-3-2-22).

**Table 2-3-2-21 Comparison of adults who had heard of or participated in the physical fitness study (%)**

Heard of or participation status	M			F		
	2005	2010	Difference	2005	2010	Difference
Had heard of	50.3	68.2	17.9	54.3	69.4	15.1
Had never heard of	49.7	31.8	-17.9	45.7	30.6	-15.1
Had participated	15.4	27.1	11.7	18.6	28.7	10.1
Had never participated	84.6	72.9	-11.7	81.4	71.3	-10.1

**Table 2-3-2-22 Comparison of understanding the physical fitness study in adults (%)**

Understanding of the physical fitness study	M			F		
	2005	2010	Difference	2005	2010	Difference
Meaningless	4.2	3.4	-0.8	1.9	2.7	0.8
Understand the physical fitness status of oneself	93.6	95.0	1.4	96.7	96.2	-0.5
Recognize the importance of physical exercise	47.7	58.1	10.4	51.4	60.2	8.8
Improve scientific knowledge of doing exercise	37.9	49.5	11.6	36.2	50.3	14.1

**3.2.3. Comparison of Anthropometric Measurements**

**3.2.3.1. Length indexes**

The height of Macao adults in 2010 was higher than 2005 in each age group. Height increased by 1.6 cm in males and 1.0 cm in females. Compared with that in 2005, significant difference was seen in the 25~49 year age group for males (increased by 2.1 cm in average) and in the 30~59 year age group for females (increased by 2.1 cm in average) ( $p < 0.05$ ). This showed that, with the great improvement in the living standard of Macao citizens in the past 5 years, the height of citizens had also increased substantially (table 2-3-2-23).

In accordance with the increase in height, the sitting height and foot length of male citizens in 2010 were also higher than that in 2005, and significant difference was found in many age groups. No significant change was seen in the sitting height and foot length of females. This indicated that compared with females, the increase of height in males was under greater influence in the increase of the body length (table 2-3-2-24 and table 2-3-2-25).

**Table 2-3-2-23 Comparison of average height in adults (cm)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
20~24 years	170.7	171.3	0.6	158.6	159	0.4
25~29 years	169.5	171.5	2.0*	157.6	158.3	0.7
30~34 years	168.6	171.1	2.5*	157	158.4	1.4*
35~39 years	168.6	170.7	2.1*	156.9	157.9	1.0*
40~44 years	167.2	169.3	2.1*	156	157.4	1.4*
45~49 years	166.5	168.3	1.8*	155.2	156.6	1.4*
50~54 years	166.3	167	0.7	154.7	155.6	0.9*
55~59 years	165.8	166.5	0.7	154.4	155.5	1.1*

\*  $p < 0.05$

**Table 2-3-2-24 Comparison of average sitting height in adults (cm)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
20~24 years	91.5	91.8	0.3	86.1	86.0	-0.1
25~29 years	91.1	92.2	1.1*	85.9	85.8	-0.1
30~34 years	91.2	91.8	0.6*	85.5	85.7	0.2
35~39 years	91.1	92.3	1.2*	85.5	86.0	0.5*
40~44 years	90.6	91.5	0.9*	85.3	85.6	0.3
45~49 years	90.2	91.2	1.0*	84.8	85.2	0.4
50~54 years	90.1	90.2	0.1	84.1	84.3	0.2
55~59 years	89.8	89.7	-0.1	84.0	84.3	0.3

\* p<0.05

**Table 2-3-2- 25 Comparison of average foot length in adults (cm)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
20~24 years	24.9	25.3	0.4	22.8	22.6	-0.2
25~29 years	24.7	25.3	0.6*	22.6	22.5	-0.1
30~34 years	24.7	25.3	0.6*	22.5	22.6	0.1
35~39 years	24.7	25.2	0.5*	22.6	22.5	-0.1*
40~44 years	24.5	25.1	0.6*	22.6	22.6	0.0
45~49 years	24.4	24.9	0.5*	22.5	22.5	0.0
50~54 years	24.3	24.8	0.5*	22.6	22.5	-0.1
55~59 years	24.6	24.8	0.2	22.6	22.5	-0.1

\* p<0.05

### 3.2.3.2. Weight and BMI

Compared with the results in 2005, an increase was found in the weight of male and female adults, with an average increase of 1.8 kg in males and 0.8 kg in females, and there was a significant increase in the weight of males in the 35~49 year age groups and in the 40~49 year age groups of females, and the difference was significant (p<0.05). Compared with that in 2005, no obvious change was seen in the BMI of Macao citizens on the whole, but there was significant change in the obesity rate in 2010. For males, the obesity rate was lower than or basically the same with that in 2005 in the 20-39 year age groups and significant change was seen in obesity rate after 40 years old, especially in the 40~44 and 45~49 year age groups, the obesity rates increased by 9.1 % and 5.3 %, respectively. For females, the obesity rate increased in the 35-39 year age groups, and besides, little change was found in other age groups (table 2-3-2-26~table 2-3-2-28).



**Table 2-3-2-26 Comparison of average weight in adults (kg)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
20~24 years	62.8	64.3	1.5	50.3	51.6	1.3
25~29 years	63.9	66.6	2.7*	50.8	50.3	-0.5
30~34 years	66.8	67.4	0.6	52.1	53.3	1.2
35~39 years	67.2	69.6	2.4*	54.2	55.7	1.5
40~44 years	65.9	69.2	3.3*	55.4	57.0	1.6*
45~49 years	65.5	68.6	3.1*	54.9	56.5	1.6*
50~54 years	65.8	66.2	0.4	55.8	55.9	0.1
55~59 years	65.1	65.3	0.2	56.8	56.5	-0.3

\* p<0.05

**Table 2-3-2-27 Comparison of average BMI in adults**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
20~24 years	21.5	21.9	0.4	20.0	20.4	0.4
25~29 years	22.3	22.6	0.3	20.4	20.1	-0.3
30~34 years	23.5	23.0	-0.5	21.1	21.2	0.1
35~39 years	23.6	23.9	0.3	22.0	22.3	0.3
40~44 years	23.6	24.1	0.5	22.7	23.0	0.3
45~49 years	23.6	24.2	0.6	22.8	23.0	0.2
50~54 years	23.8	23.7	-0.1	23.3	23.1	-0.2
55~59 years	23.6	23.5	-0.1	23.8	23.3	-0.5

\* p<0.05

**Table 2-3-2-28 Comparison of average obesity rate in adults (%)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
20~24 years	7.4	5.4	-2.0	2.0	2.1	0.1
25~29 years	4.7	4.5	-0.2	2.7	1.5	-1.2
30~34 years	12.4	8.3	-4.1*	3.6	3.0	-0.6
35~39 years	9.9	10.8	0.9	2.3	6.9	4.6*
40~44 years	4.5	13.6	9.1*	6.0	6.1	0.1
45~49 years	6.9	12.2	5.3*	5.9	6.7	0.8
50~54 years	8.1	6.9	-1.2	7.8	6.5	-1.3
55~59 years	3.8	7.4	3.6*	9.9	9.9	0.0

\* p<0.05

**3.2.3.3. Circumference indexes**

Compared with 2005, little change was found in chest and waist circumferences of male adults in most age groups. There was an increase in hip circumference resulted in a slight decrease of WHR in 2010. For males, the chest circumferences increased by 1.5 cm and 1.7 cm, respectively in the 40~44 and 45~49 year age groups ( $p < 0.05$ ), and the hip circumferences increased by 2.0 cm, 1.6 cm, 1.3 cm and 1.8 cm, respectively in the 25~29, 35~39, 40~44 and 45~49 year age groups ( $p < 0.05$ ). For females, there was a trend of decreased chest, waist and hip circumferences as well as WHR. The chest circumference of females decreased by 1.4 cm, 2.2 cm and 2.6 cm in the 25~29, 50~54 and 55~59 year age groups, respectively ( $p < 0.05$ ); the waist circumference of females increased by 2.3 cm, 2.2 cm, 2.3 cm, 2.2 cm and 2.6 cm in the 20~24, 30~34, 35~39, 40~44 and 45~49 year age groups, respectively; and the hip circumference increased by 1.3 cm, 1.6 cm, 1.6 cm and 1.0 cm in the 30~34, 35~39, 40~44 and 45~49 year age groups, respectively ( $p < 0.05$ ) (table 2-3-2-29~table 2-3-2-32).

**Table 2-3-2-29 Comparison of average chest circumference in adults (cm)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
20~24 years	87.7	88.5	0.8	81.0	80.4	-0.6
25~29 years	89.4	90.5	1.1	81.3	79.9	-1.4*
30~34 years	92.2	92.0	-0.2	83.1	82.7	-0.4
35~39 years	92.7	92.9	0.2	84.9	84.4	-0.5
40~44 years	92.0	93.5	1.5*	86.5	85.9	-0.6
45~49 years	92.1	93.8	1.7*	86.5	85.9	-0.6
50~54 years	92.2	92.2	0.0	88.4	86.2	-2.2*
55~59 years	92.0	91.9	-0.1	89.3	86.7	-2.6*

\*  $p < 0.05$

**Table 2-3-2-30 Comparison of average waist circumference in adults (cm)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
20~24 years	76.9	78.7	1.8	68.1	70.4	2.3*
25~29 years	79.6	80.6	1.0	69.2	70.1	0.9
30~34 years	83.6	82.0	-1.6	71.8	74.0	2.2*
35~39 years	84.5	85.0	0.5	74.4	76.7	2.3*
40~44 years	84.3	85.2	0.9	76.2	78.4	2.2*
45~49 years	85.2	86.6	1.4	76.8	79.4	2.6*
50~54 years	85.9	85.4	-0.5	79.4	79.9	0.5
55~59 years	86.6	85.7	-0.9	81.7	81.4	-0.3

\*  $p < 0.05$

**Table 2-3-2-31 Comparison of average hip circumference in adults (cm)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
20~24 years	90.7	91.8	1.1	88.3	89.4	1.1
25~29 years	91.2	93.2	2.0*	88.3	88.7	0.4
30~34 years	92.9	93.5	0.6	89.1	90.4	1.3*
35~39 years	92.7	94.3	1.6*	90.4	92.0	1.6*
40~44 years	92.6	93.9	1.3*	90.8	92.4	1.6*
45~49 years	91.9	93.7	1.8*	90.9	91.9	1.0*
50~54 years	92.4	93.0	0.6	91.8	91.7	-0.1
55~59 years	92.0	92.5	0.5	92.5	92.1	-0.4

\* p<0.05

**Table 2-3-2-32 Comparison of average WHR of adults**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
20~24 years	0.85	0.86	0.01	0.77	0.79	0.02*
25~29 years	0.87	0.86	-0.01	0.78	0.79	0.01
30~34 years	0.90	0.88	-0.02*	0.80	0.82	0.02*
35~39 years	0.91	0.90	-0.01*	0.82	0.83	0.01*
40~44 years	0.91	0.91	0.00	0.84	0.85	0.01
45~49 years	0.93	0.92	-0.01	0.84	0.86	0.02*
50~54 years	0.93	0.92	-0.01	0.86	0.87	0.01
55~59 years	0.94	0.93	-0.01*	0.88	0.88	0.00

\* p<0.05

**3.2.3.4. Width indexes**

Compared with the results in 2005, the shoulder and pelvis width of male adults in 2010 tended to decrease resulting in a much thinner and higher figure due to the significant longitudinal increase in height and sitting height, of which the shoulder width decreased by 0.7 cm, 0.5 cm, 0.5 cm and 0.9 cm in the 20~24, 30~34, 35~39 and 55~59 year age groups, respectively (p<0.05), and the pelvis width decreased by 0.4 cm, 0.7 cm, 0.5 cm, 0.3 cm, 0.8 cm and 0.7cm in the 30~34, 35~39, 40~44, 45~49, 50~54 and 55~59 year age groups, respectively (p<0.05). For females, the shoulder and pelvis width increased after age 40, of which the shoulder width increased by 0.6 cm, 0.5 cm, 0.3 cm and 0.3 cm in the 40~44, 45~49, 50~54 and 55~59 year age groups, respectively (p<0.05), and the pelvis width increased by 0.4 cm in the 35~39, 40~44 and 45~49 year age groups, respectively (p<0.05)(table 2-3-2-33 and table 2-3-2-34).

**Table 2-3-2-33 Comparison of average shoulder width in adults (cm)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
20~24 years	38.8	38.1	-0.7*	34.7	34.4	-0.3
25~29 years	39.1	38.9	-0.2	34.7	34.5	-0.2
30~34 years	38.9	38.4	-0.5*	34.9	34.8	-0.1
35~39 years	38.9	38.4	-0.5*	34.7	35.0	0.3
40~44 years	38.4	38.3	-0.1	34.5	35.1	0.6*
45~49 years	38.2	38.1	-0.1	34.4	34.9	0.5*
50~54 years	38.0	37.7	-0.3	34.3	34.6	0.3*
55~59 years	37.8	36.9	-0.9*	34.2	34.5	0.3*

\* p<0.05

**Table 2-3-2-34 Comparison of average pelvis width in adults (cm)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
20~24 years	27.0	26.9	-0.1	26.5	26.6	0.1
25~29 years	27.2	27.2	0.0	26.7	26.5	-0.2
30~34 years	27.5	27.1	-0.4*	26.8	27.1	0.3
35~39 years	27.9	27.2	-0.7*	27.2	27.6	0.4*
40~44 years	27.8	27.3	-0.5*	27.4	27.8	0.4*
45~49 years	27.8	27.5	-0.3*	27.5	27.9	0.4*
50~54 years	28.0	27.2	-0.8*	27.8	28.0	0.2
55~59 years	28.1	27.4	-0.7*	28.2	28.4	0.2

\* p<0.05

**3.2.3.5. Body composition**

Compared with the results in 2005, the upper arm skinfold thickness tended to decrease in male adults in each age group except in the 20~24 year age group in 2010 (table 2-3-2-35). The subscapular skinfold thickness of male decreased in all age groups in 2010, (table 2-3-2-36). The abdominal skinfold thickness of adult males in 2010 decreased by 1.9 mm, 4.1 mm, 1.4 mm and 3.4 mm in the 25~29, 30~34, 50~54 and 55~59 year age groups, respectively (p<0.05). No significant change was found in the upper skinfold thickness of female adults in both studies (table 2-3-2-35), and the subscapular skinfold thickness of females was lower than that in 2005 (table 2-3-2-36). The abdominal skinfold thickness of females tended to decrease, except in the 30~34 and 35~39 year age groups and significant difference was seen in these age groups (table 2-3-2-37). The most significant decrease was seen in the subscapular skinfold thickness of both males and females (table 2-3-2-36).

**Table 2-3-2-35 Comparison of average upper arm skinfold thickness in adults (mm)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
20~24 years	11.3	10.5	-0.8	18.4	19.1	0.7
25~29 years	12.6	10.5	-2.1*	18.7	18.7	0.0
30~34 years	14.7	11.2	-3.5*	19.3	20.5	1.2
35~39 years	14.0	12.0	-2.0*	20.8	21.9	1.1
40~44 years	12.8	11.5	-1.3*	21.8	22.2	0.4
45~49 years	11.9	10.5	-1.4*	21.6	22.0	0.4
50~54 years	12.8	9.4	-3.4*	22.3	22.3	0.0
55~59 years	12.6	9.1	-3.5*	23.5	22.4	-1.1

\* p<0.05

**Table 2-3-2-36 Comparison of average subscapular skinfold thickness in adults (mm)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
20~24 years	15.6	14.2	-1.4*	18.9	14.4	-4.5*
25~29 years	17.9	15.0	-2.9*	19.0	14.2	-4.8*
30~34 years	21.3	16.1	-5.2*	21.4	17.3	-4.1*
35~39 years	21.0	19.5	-1.5*	23.0	19.0	-4.0*
40~44 years	20.3	18.5	-1.8*	24.6	19.4	-5.2*
45~49 years	20.3	18.3	-2.0*	24.4	19.9	-4.5*
50~54 years	21.1	17.0	-4.1*	25.8	19.9	-5.9*
55~59 years	21.2	16.5	-4.7*	26.9	20.0	-6.9*

\* p<0.05

**Table 2-3-2-37 Comparison of average abdominal skinfold thickness in adults (mm)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
20~24 years	17.8	19.2	1.4	24.3	21.7	-2.6*
25~29 years	21.5	19.6	-1.9*	23.6	20.8	-2.8*
30~34 years	25.1	21.0	-4.1*	24.2	23.6	-0.6
35~39 years	24.3	24.3	0.0	25.8	24.3	-1.5
40~44 years	23.4	23.6	0.2	28.0	25.2	-2.8*
45~49 years	23.9	24.1	0.2	28.0	26.2	-1.8*
50~54 years	23.6	22.2	-1.4*	31.2	26.5	-4.7*
55~59 years	25.0	21.6	-3.4*	32.3	26.8	-5.5*

\* p<0.05

The percentage body fat in 2005 was higher than that in 2010 for both males and females, while the lean body mass in 2010 was higher than that in 2005 for both males and females (table 2-3-2-38 and 2-3-2-39).

**Table 2-3-2-38 Comparison of average percentage body fat in adults (%)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
20~24 years	17.0	15.9	-1.1	25.3	23.2	-2.1
25~29 years	18.7	16.3	-2.4	25.5	22.9	-2.6
30~34 years	21.3	17.2	-4.1	27.2	25.5	-1.7
35~39 years	20.8	19.2	-1.6	29.0	27.4	-1.6
40~44 years	19.9	18.5	-1.4	30.5	27.7	-2.8
45~49 years	19.4	17.9	-1.5	30.3	27.9	-2.4
50~54 years	20.3	16.8	-3.5	31.5	28.1	-3.4
55~59 years	20.3	16.4	-3.9	32.8	28.2	-4.6

\* p<0.05

**Table 2-3-2-39 Comparison of average lean body mass in adults (kg)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
20~24 years	51.7	53.7	2	37.2	39.3	2.1
25~29 years	51.5	55.3	3.8	37.5	38.7	1.2
30~34 years	52.1	55.5	3.4	37.5	39.2	1.7
35~39 years	52.8	55.9	3.1	38.0	40.0	2
40~44 years	52.6	55.9	3.3	38.1	40.8	2.7
45~49 years	52.1	56.0	3.9	37.8	40.3	2.5
50~54 years	52.1	54.9	2.8	37.9	39.9	2
55~59 years	51.6	54.4	2.8	37.6	40.1	2.5

\* p<0.05

### 3.2.4. Comparison of Physiological Function

#### 3.2.4.1. Resting pulse

Compared with 2005, a significant decrease was seen in the resting pulse of males and females in each age group except for males in the 20~24, 25~29 and 40~44 year age groups and females in the 20~24 year age groups (p<0.05) (table 2-3-2-40).

**Table 2-3-2-40 Comparison of average resting pulse in adults (times/minute)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
20~24 years	75.3	74.1	-1.2	77.1	76.0	-1.1
25~29 years	74.6	75.9	1.3*	79.0	75.9	-3.1*
30~34 years	77.4	74.2	-3.2*	78.6	76.0	-2.6*
35~39 years	77.6	73.6	-4.0*	79.0	73.8	-5.2*
40~44 years	77.2	75.8	-1.4	77.1	74.7	-2.4*
45~49 years	77.3	74.1	-3.2*	76.5	73.7	-2.8*
50~54 years	77.3	74.4	-2.9*	74.7	73.3	-1.4*
55~59 years	76.7	74.4	-2.3*	74.9	72.8	-2.1*

\* p<0.05

**3.2.4.2. Blood pressure**

Compared with 2005, the systolic pressure and pressure difference tended to increase, and diastolic pressure tended to decrease in both males and females in 2010. The systolic pressure of males in 2010 increased significantly in all age groups except in the 30~34, 35~39 and 55~59 year age groups (table 2-3-2-41). There was a significant decrease in diastolic pressure of males in the 30~34, 35~39, 40~44 and 50~54 year age groups in 2010 (table 2-3-2-42). The systolic pressure of females in the 20~39 year age groups increased significantly in 2010 (table 2-3-2-41) and the diastolic pressure of females in the 40~59 year age groups decreased significantly (table 2-3-2-42). The pressure difference increased dramatically for both males and females, except for adults in the 55~59 year age groups (table 2-3-2-43).

**Table 2-3-2-41 Comparison of average systolic pressure in adults (mmHg)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
20~24 years	117.5	120.1	2.6*	104.6	109.8	5.2*
25~29 years	116.5	121.7	5.2*	104.4	109.4	5.0*
30~34 years	120.0	121.6	1.6	105.3	111.1	5.8*
35~39 years	120.8	123.2	2.4	108.8	113.0	4.2*
40~44 years	123.5	127.3	3.8*	115.3	115.9	0.6
45~49 years	125.6	128.4	2.8*	119.0	119.0	0.0
50~54 years	126.2	128.9	2.7*	123.0	122.5	-0.5
55~59 years	131.3	130.6	-0.7	127.7	124.9	-2.8

\* p<0.05

**Table 2-3-2-42 Comparison of average diastolic pressure in adults (mmHg)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
20~24 years	76.0	75.0	-1.0	67.3	68.4	1.1
25~29 years	75.1	75.7	0.6	68.2	69.3	1.1
30~34 years	78.7	76.0	-2.7*	69.5	70.6	1.1
35~39 years	79.8	78.5	-1.3*	71.9	71.9	0.0
40~44 years	82.2	80.1	-2.1*	75.4	72.8	-2.6*
45~49 years	82.9	81.8	-1.1	76.7	75.0	-1.7*
50~54 years	82.9	81.0	-1.9*	78.7	75.7	-3.0*
55~59 years	83.1	81.7	-1.4	79.1	76.8	-2.3*

\* p<0.05

**Table 2-3-2-43 Comparison of average pressure difference in adults (mmHg)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
20~24 years	41.5	45.1	3.6*	37.3	41.3	4.0*
25~29 years	41.4	46.0	4.6*	36.3	40.1	3.8*
30~34 years	41.4	45.6	4.2*	35.8	40.5	4.7*
35~39 years	41.4	44.7	3.3*	36.9	41.1	4.2*
40~44 years	41.2	47.1	5.9*	39.9	43.1	3.2*
45~49 years	42.7	46.6	3.9*	42.3	43.9	1.6*
50~54 years	43.4	47.9	4.5*	44.3	46.8	2.5*
55~59 years	48.6	48.9	0.3	48.6	48.1	-0.5

\* p<0.05

3.2.4.3. Vital capacity and vital capacity/weight ratio

Compared with 2005, no significant change was found in the vital capacity of both males and females in 2010, and the vital capacity/weight of males and females tended to decrease as a whole. There was a significant increase in the vital capacity of males in the 30~34 year age groups and a significant decrease in females in the 25~29, 45~49 year age groups (table 2-3-2-44). Compared with 2005, the vital capacity/weight of males increased by 3.0 in the 30~34 year age groups and decreased by 3.5 in the 45~49 year age groups ( $p<0.05$ ). The vital capacity/weight of females decreased significantly in the 20~24, 25~29, 30~34 and 45~49 year age groups (table 2-3-2-45).

Table 2-3-2-44 Comparison of average vital capacity in adults (ml)

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
20~24 years	3901.7	3865.1	-36.6	2761.2	2666.9	-94.3
25~29 years	3942.7	3981.7	39.0	2801.6	2660.2	-141.4*
30~34 years	3766.6	4008.2	241.6*	2703.2	2626.2	-77.0
35~39 years	3782.5	3793.4	10.9	2658.7	2621.5	-37.2
40~44 years	3617.5	3698.1	80.6	2534.8	2516.8	-18.0
45~49 years	3498.6	3431.9	-66.7	2446.6	2363.2	-83.4*
50~54 years	3283.9	3363.3	79.4	2252.6	2224.2	-28.4
55~59 years	3167.6	3215.9	48.3	2140.8	2142.2	1.4

\*  $p<0.05$

Table 2-3-2-45 Comparison of average vital capacity/weight in adults (ml/kg)

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
20~24 years	63.0	60.8	-2.2	55.6	52.3	-3.3*
25~29 years	62.3	60.8	-1.5	55.7	53.1	-2.6*
30~34 years	57.3	60.3	3.0*	52.5	49.8	-2.7*
35~39 years	57.0	55.2	-1.8	49.7	48.0	-1.7
40~44 years	55.4	54.4	-1.0	46.4	44.9	-1.5
45~49 years	54.3	50.8	-3.5*	45.4	42.6	-2.8*
50~54 years	50.8	51.4	0.6	40.9	40.5	-0.4
55~59 years	49.3	50.0	0.7	38.5	38.8	0.3

\*  $p<0.05$

3.2.4.4. Step index

Compared with 2005, the step index of males and females in 2010 tended to increase as a whole, and a significant difference was found in adults after age 40 (table 2-3-2-46).



**Table 2-3-2-46 Comparison of average step index in adults**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
20~24 years	52.3	53.4	1.1	53.5	54.1	0.6
25~29 years	52.4	53.0	0.6	54.4	55.6	1.2
30~34 years	50.1	53.9	3.8	55.6	56.3	0.7
35~39 years	52.4	54.9	2.5	56.3	57.5	1.2
40~44 years	57.1	55.8	-1.3*	57.4	58.5	1.1*
45~49 years	58.6	56.8	-1.8*	60.3	60.4	0.1*
50~54 years	57.7	58.3	0.6*	61.9	62.6	0.7*
55~59 years	54.1	58.3	4.2*	60.3	61.8	1.5*

\* p<0.05

### 3.2.5. Comparison of Physical Fitness

#### 3.2.5.1. Strength

Compared with 2005, vertical jump and push-ups tended to increase in male in the 25~29 and 30~34 year age groups (table 2-3-2-47 and table 2-3-2-48), and no significant change was seen in the vertical jump or one-minute sit-ups in females. The grip and back strength decreased dramatically in both males and females with significant difference except in the grip strength of males in the 30~34, 35~39 and 55~59 year age groups (table 2-3-2-49 and table 2-3-2-50).

**Table 2-3-2-47 Comparison of average vertical jump in adults (cm)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
20~24 years	38.8	38.3	-0.5	24.6	23.9	-0.7
25~29 years	37.3	38.8	1.5*	24.0	24.3	0.3
30~34 years	35.4	37.1	1.7*	23.2	23.2	0.0
35~39 years	34.2	35.8	1.6	22.1	22.6	0.5

\* p<0.05

**Table 2-3-2-48 Comparison of average push-ups (male) and one-minute sit-ups (female) in adults (times)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
20~24 years	24.2	24.6	0.4	22.2	23.6	1.4
25~29 years	22.7	25.8	3.1*	21.6	22.7	1.1
30~34 years	19.7	25.0	5.3*	18.7	19.3	0.6
35~39 years	18.3	23.5	5.2*	15.5	17.0	1.5

\* p<0.05

**Table 2-3-2-49 Comparison of average back strength in adults (kg)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
20~24 years	119.2	103.6	-15.6*	62.4	55.2	-7.2*
25~29 years	118.7	104.1	-14.6*	64.6	55.5	-9.1*
30~34 years	122.5	107.9	-14.6*	66.4	55.9	-10.5*
35~39 years	118.7	109.0	-9.7*	70.0	58.4	-11.6*

\* p<0.05

**Table 2-3-2-50 Comparison of average grip strength in adults (kg)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
20~24 years	42.3	38.9	-3.4*	24.0	22.6	-1.4*
25~29 years	42.2	39.5	-2.7*	24.9	22.7	-2.2*
30~34 years	43.2	41.9	-1.3	25.0	22.7	-2.3*
35~39 years	43.7	42.9	-0.8	25.8	23.6	-2.2*
40~44 years	42.9	41.5	-1.4*	25.1	24.0	-1.1*
45~49 years	42.7	40.5	-2.2*	24.7	23.0	-1.7*
50~54 years	40.8	39.1	-1.7*	23.7	21.9	-1.8*
55~59 years	39.7	38.6	-1.1	22.6	21.5	-1.1*

\* p<0.05

**3.2.5.2. Flexibility**

Compared with 2005, there was no obvious change in the flexibility of males and females, but significant difference was found in the sit and reach of females in the 30~34 year age groups (table 2-3-2-51).

**Table 2-3-2-51 Comparison of average sit and reach in adults (cm)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
20~24 years	3.4	3.2	-0.2	5.4	6.1	0.7
25~29 years	2.3	2.8	0.5	6.0	6.4	0.4
30~34 years	1.7	1.5	-0.2	6.9	4.8	-2.1*
35~39 years	2.5	2.3	-0.2	5.8	5.8	0.0
40~44 years	2.7	2.2	-0.5	5.7	5.5	-0.2
45~49 years	2.6	1.9	-0.7	5.8	5.3	-0.5
50~54 years	1.4	2.7	1.3	6.0	5.4	-0.6
55~59 years	0.3	1.0	0.7	6.2	6.3	0.1

\* p<0.05

**3.2.5.3. Respond**

Compared with 2005, no significant change was seen in the average respond time of males (except in the 20~24 and 30~34 year age groups, an increase in average respond time was seen), but a substantial increase with significant difference was found in the average respond time in females (except in the 55~59 year age groups) (table 2-3-2-52).

**Table 2-3-2-52 Comparison of average selective respond time in adults(sec)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
20~24 years	0.39	0.41	0.02*	0.42	0.43	0.01*
25~29 years	0.41	0.41	0.00	0.43	0.44	0.01*
30~34 years	0.40	0.42	0.02*	0.43	0.45	0.02*
35~39 years	0.41	0.41	0.00	0.44	0.45	0.01*
40~44 years	0.43	0.43	0.00	0.45	0.47	0.02*
45~49 years	0.43	0.43	0.00	0.46	0.49	0.03*
50~54 years	0.44	0.45	0.01	0.48	0.49	0.01*
55~59 years	0.45	0.47	0.02	0.50	0.51	0.01

\* p<0.05

**3.2.5.4. Balance**

Compared with 2005, the balance of males and females tended to increase as a whole, of which there was a significant increase in the average of one foot stands with eyes closed (OFSEC) of males in the 30~34, 40~44, 45~49 and 50~54 year age groups, and females in the 35~39 and 50~54 year age groups (table 2-3-2-53).

**Table 2-3-2-53 Comparison of average OFSEC time in adults (sec)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
20~24 years	48.3	43.2	-5.1	46.1	43.5	-2.6
25~29 years	42.4	44.3	1.9	43.5	47.8	4.3
30~34 years	30.7	38.7	8.0*	32.2	36.5	4.3
35~39 years	34.8	38.1	3.3	27.6	37.6	10.0*
40~44 years	24.2	31.3	7.1*	24.5	28.9	4.4
45~49 years	20.7	30.6	9.9*	18.7	20.5	1.8
50~54 years	17.7	22.9	5.2*	14.3	17.9	3.6*
55~59 years	17.9	18.8	0.9	12.1	13.0	0.9

\* p<0.05

### 3.3. Summary

#### 3.3.1. Basic Information

There were 3540 subjects in 2010 from 10 government institutions and 22 private institutions. Compared with the results in 2005, the main birth places of adults were Macao and Mainland China; however, the proportion of those born in Mainland China decreased and those born in Macao increased in 2010 study. Education levels were mainly secondary school and university education, but the proportion of university degree (including master and doctoral degree) increased significantly. Most of the adults were working indoor with an “air-conditioned” environment. Most adults worked 35~40 hours and 40~50 hours per week and the proportion of those who worked 35~40 hours and 40~50 hours per week had also increased. There was a significant decrease in the proportion of non-working females.

#### 3.3.2. Lifestyle

In 2010, the number of sleeping hours of adults decreased slightly, and most adults slept 6~9 hours per day. Adults who considered their sleeping quality to be average accounted for the highest proportion. There was an increase in the proportion with bad sleeping quality, and a decrease in the proportion with good sleeping quality. Most adults walked for less than 30 minutes and 30~60 minutes each day, and a significant increase in the proportion of those with daily walking hours less than 30 minutes was seen. Most adults had an accumulative average sitting time of 3~6 hours, and the proportion of sitting for over 6 hours increased. The main activity participated during leisure time was “Audio-visual entertainment” but the proportion was decreasing, while the proportion of those participating in “physical exercise” had increased.

Compared with the results in 2005, the proportion of adults who never smoked increased with a greater increase in males than that in females. No significant change was found in the smoking quantity among smokers and the proportion of those quitting smoking. A significant decrease in the proportion of females who had smoked for less than 5 years and a significant increase in the proportion of females who had smoked for over 15 years were found, which indicated that female adults had a long-term smoking habit. An increase in the proportion of adults who drank alcohol was seen, with a decrease in drinking frequency for males and an increase for females. In regards to types of alcohol being consumed, a significant increase in the proportion of those who chose liquor, wine or fruit wine and mixed alcohol was found, and there was a significant decrease in the proportion of those drinking beer.

15.5 % adults participated in physical exercise frequently and 54.1 % participated in exercise occasionally in 2010, both of which were higher than the results in 2005. Most physical exercisers participated in physical exercise for 1~2 times a week in average with an exercise duration of 30~60 minutes each time and feeling of “slight increase in breathing & heart rate and perspiring slightly”. Compared with the results in 2005, an increase in the proportion of those with exercise frequency of 1~2 times per week and exercise duration of more than 60 minutes each time were seen, and the proportion of those with exercise intensity of “rapid breathing and increased heart rate and perspiring greatly” increased

significantly for males and changed little for females. The persistent time of physical exercise remained polarized. The proportion of those who persisted to continue exercising for less than 6 months increased, and those for 1~5 years decreased, which indicated that a significant proportion of adults had just developed the habit of exercising. In terms of exercise purposes, except for the main purposes of “preventing and curing diseases”, “improving exercise ability” and “relieving pressure and regulating mood”, more males chose “losing weight and keeping fit” and “socializing”, and less chose “preventing and curing diseases”, and little change was found in females. In terms of exercise locations, “park” and “gym and stadium” remained as the top choices; however, the proportion of those choosing “gym and stadium” increased. In terms choosing ball games as their first choice, the top choices of males were “football”, “basketball”, “badminton”, “table tennis”, and the top choices of females were badminton”, “table tennis” and “basketball”, and a significant increase in the proportion of those taking “other ball games” as the first choice for males and females was found, which showed that their interest in ball game were more extensive. The main obstacles that hindered adults to participate in physical exercise, except for considering “no time” as the main obstacle, an increase was seen in the proportion of those who did not participate physical exercise due to “laziness” for both males and females.

### **3.3.3. Occurrence of Diseases and Understanding of Physical Fitness Study**

Among the adult subjects in 2010, the proportion of those diagnosed with diseases in the past five years was higher than in 2005. Significant increase was seen in the proportion of adults diagnosed with “hypertension”.

Compared with 2005, a great increase was found in 2010 in adults who had heard of and participated in the “physical fitness study”, which indicated that Macao adults had been more familiarized with and better recognized the physical fitness study due to years of promotion. In regards to understanding of the physical fitness study, more adults considered that the study was “to improve scientific knowledge of doing exercises” and “to recognize the importance of physical exercising”.

### **3.3.4. Anthropometric, Physiological Function and Physical Fitness Information**

Anthropometric indexes including length and width indexes of both males and females were fully developed and tended to decrease as age increased between age 20~59. Weight, circumference measurements, skinfold thickness and BMI of males continued to increase before age 40, then remained stable or decreased slightly thereafter; for females, the indexes continued to increase. The waist circumference increased faster than hip circumference, which resulted in an increase in WHR. After age 35, there was a significant increase in the proportion of those with a WHR over the standard and in obesity.

For adults aged 20~59, overall physiological function declined gradually with age as shown by the decrease in heart and lung function, gradual increase in blood pressure and pressure difference, significant decrease of vital capacity; nonetheless, step test index increased. Males generally had a better physiological function than females of the same age.

Physical fitness tended to decline with age; however, the decline of physical fitness varied according to age, genders and indexes. Grip and back strength varied slightly with age and remained at their maximum for a fairly long period. On the other hand, explosive force, muscle endurance strength and balance declined rather quickly with age. Flexibility remained basically the same for females during adulthood except for certain age groups. On comparison between males and females, flexibility of females was better than males. For the other physical fitness indexes, males were better than females with the exception of balance ability in which no difference among genders was observed.

Compared with the study results in 2005, differences were seen in the aspects of shape, function and fitness in adults.

Height of adults in each age group in 2010 was higher than that in 2005. The height of males increased by 1.6 cm in average, with an average height of 171.3 cm in the age groups of 20~24, and the height of female increased by 1.0 cm in average, with an average height of 159.0 cm at age 20~24. This showed that in the past 5 years, with great improvement in the living standard of Macao citizens, the height of citizens had also enhanced.

In 2010, the weight of males and females increased with no significant change in BMI, but significant change was seen in obesity rate. The proportion of obese people increased significantly at age 40~49 in males and 35-39 in females.

In 2010, the chest and waist circumferences of males varied little and hip circumferences increased, which resulted in a decrease in WHR; moreover, shoulder and pelvis width decreased. For females, chest circumference decreased, waist and hip circumferences and WHR increased, and shoulder and pelvis width increased after 40 years old. The skinfold thickness tended to decrease for both males and females, and the most significant decrease was seen in subscapular skinfold thickness.

When results of the physiological functions were compared with that in 2005, there was a decrease in resting pulse and diastolic pressure in both males and females in 2010, whereas an increase in systolic pressure and pressure difference were seen. Vital capacity/weight ratio tended to decrease and step test index increased.

In terms of physical fitness, results were compared with that in 2005, explosive force and muscle endurance strength increased in males, and basically there was no change in female adults. The grip strength and back strength decreased significantly, with a slight decrease in flexibility and an increase in balance for both males and females. A significant decrease in respond capability was found in female.

## 4. Seniors

### 4.1. Physical Fitness Conditions of Seniors in 2010

#### 4.1.1. Basic Information of the Subjects

Subjects were divided into two groups according to genders and were further classified according to age from age 60, with a five years difference in each age group, i.e. 60~64 and 65~69, having a total of 4 groups. Table 2-4-1-1 showed the number of subjects in each group.

298 samples (136 males and 162 females) of over age 60 were drawn from Macao public or private institutes and communities that were mainly located in the north and central areas. 66 subjects (25 males and 41 females) were randomly drawn from senior centers in the north area (Paróquia de Nossa Senhora de Fátima), they were Centro de Dia da Ilha Verde, Asilo de Betânia, Centro de Convívio Fai Chi Kei, Centro de Convívio "Kei Hong Lok Yuen" do Centro Pastoral da Areia Preta, Centro I Chon da União Geral das Associações dos Moradores de Macau, Associação de Amizade dos Moradores da Zona de Nordeste de Macau, Centro Comunitário de Iao Hon, Centro de Apoio aos Idosos da União Geral das Associações dos Moradores de Macau, Centro de Convívio "Clube de Terceira Idade, and supplemental testing site (Centro de Dia de Mong - Há). 24 subjects (0 male and 24 females) were randomly drawn from senior centers in the central area (Paróquia de Santo António and Paróquia de S. Lázaro), they were Casa para Anciãos da Paróquia de Santo António, Centro de Convívio da Associação de Mútuo Auxílio dos Moradores do Bairro de San Kio and supplemental testing site (Centro de Convívio Casa dos "Pinheiros"). 203 subjects (42 males and 161 females) were randomly drawn from senior centers in the south area (Paróquia de São Francisco Xavier, Paróquia de Nossa Senhora do Carmo, Paróquia de S. Lourenço and Paróquia da Sé Catedral), they were Centro de Dia do Porto Interior, Centro de Convívio "Missão Luterana de Hong Kong e Macau / Centro de Terceira Idade Yan Kei", Centro de Cuidados Especiais Longevidade (Serviço de Apoio Domiciliário), União Geral das Associações dos Idosos de Macau, Centro de Serviço aos Empregados da Praça de Ponte e Horta, Macao Polytechnic Institute - Seniors Academy Instituto Politécnico de Macau - Academia do Cidadão Sénior, Associação das Idosas de Fu Lun de Macau, Centro de Dia da Praia do Manduco, and supplemental testing sites (Centro de Lazer e Recreação dos Anciãos da União Geral das Associações dos Moradores de Macau, Centro de Convívio da Associação dos Habitantes das Ilhas Kuan Iek) (table 3-4-1-1). Table 3-4-1-2 showed the distribution of the subjects in the senior centers.

Gender	Number of senior subjects	
	60~64 years	65~69 years
Male	109	94
Female	262	126
Total	371	220

Among the 591 senior subjects, 54.7 % of males and 66.2 % of females were born in Mainland China,

while only 30.0 % of males and 26.3 % of females were born in Macao. Significant difference among genders was seen in the birth place of the subjects (figure 2-4-1-1, table 3-4-1-3). The proportion of senior subjects that had elementary level education (primary school or below) was relatively low (34.5 % for males and 54.1 % for females), and the proportion of seniors having secondary education (secondary school or university degree) was higher (63.1 % for males and 45.9 % for females). Educational level of males and females was significantly different between age groups ( $P < 0.05$ ), with which the educational level of the 60-64 year age group was generally higher than that of the 65-69 age group (figure 2-4-1-2, table 3-4-1-4). Having a labor intensive occupation currently or before retirement had the highest proportion in the senior subjects, with accounted for 56.7 % males and 57.5 % females. The proportion of senior subjects having a non-labor intensive occupation currently or before retirement was 43.3 % for males and 42.5 % for females. The proportion of labor intensive senior subjects tended to increase with age for males, and decrease with age for females (figure 2-4-1-3, 3-4-1-5). Working indoor currently or before retirement accounted for a larger proportion (71.7 % of males and 96.3 % of females). No significant difference in working environment between age groups was observed (figure 2-4-1-4, table 3-4-1-6).

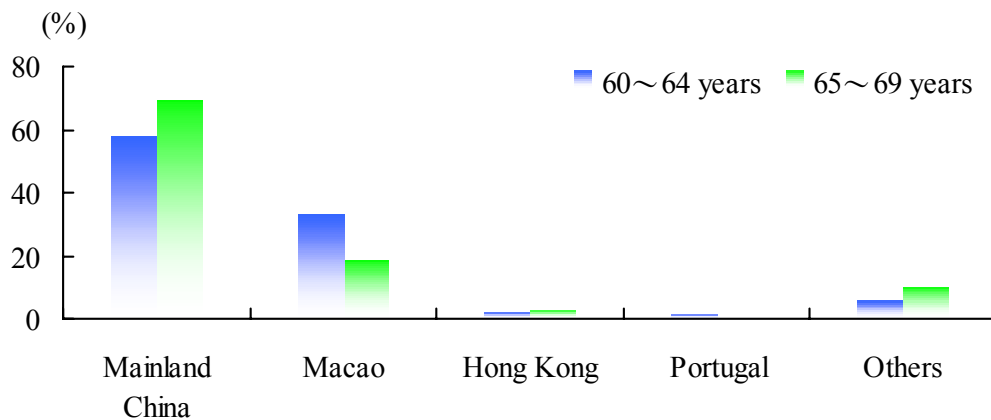


Figure 2-4-1-1 Birth places

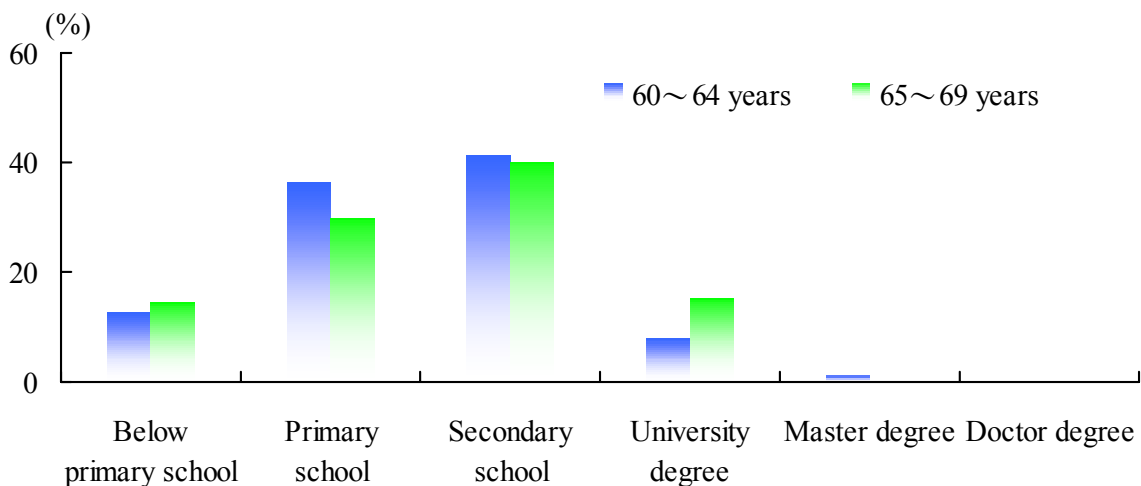


Figure 2-4-1-2 Education levels



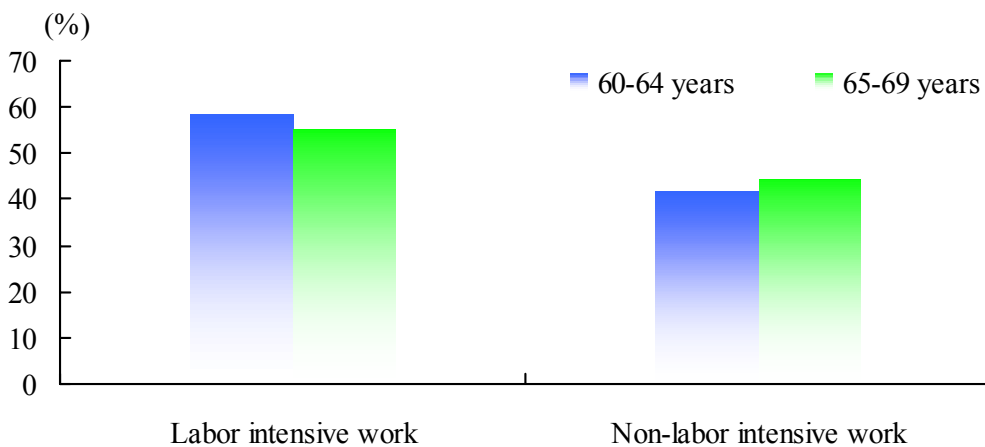


Figure 2-4-1-3 Work intensity

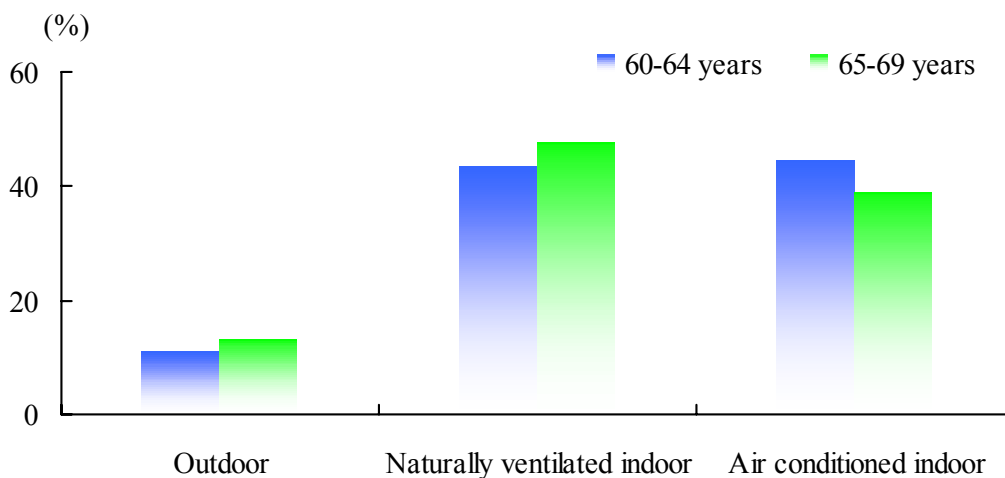


Figure 2-4-1-4 Working environments

In addition, among the studied seniors, 48.8 % of males and 53.9 % of females did not work, which accounted for the highest proportion. Nevertheless, the proportion of males in the 60-64 year age group who did not work was lower than that of females of the same age group ( $P < 0.05$ ). About 6.9 % of males and 4.9 % of females were still working for an average of above 50 hours per week (table 3-4-1-7).

#### 4.1.2. Lifestyle

Habits, physical exercise, occurrence of diseases and understanding of the physical fitness study were examined in the senior subjects (age 60~69).

##### 4.1.2.1. Habits

Habits included daily sleeping hours and sleeping quality, accumulated walking and sitting hours, activity manners during leisure time, smoking and alcohol consumption.

Results showed that 69.2 % of seniors slept for an average of 6~9 hours daily, 27.1 % slept for less than 6 hours, and 3.7 % for 9 hours or above (table 3-4-2-1). The amount of sleeping time differed between males and females. More females slept for an average of less than 6 hours daily than males ( $P < 0.05$ ) while more males slept for 6~9 hours compared to females ( $P < 0.05$ ). Proportion of females who slept for 9 hours or more was 0.5 % higher than males (figure 2-4-1-5). In terms of different age groups, the percentage of subjects sleeping for more than 6 hours in age groups of 60~64 was higher than in age groups of 65~69 (figure 2-4-1-6).

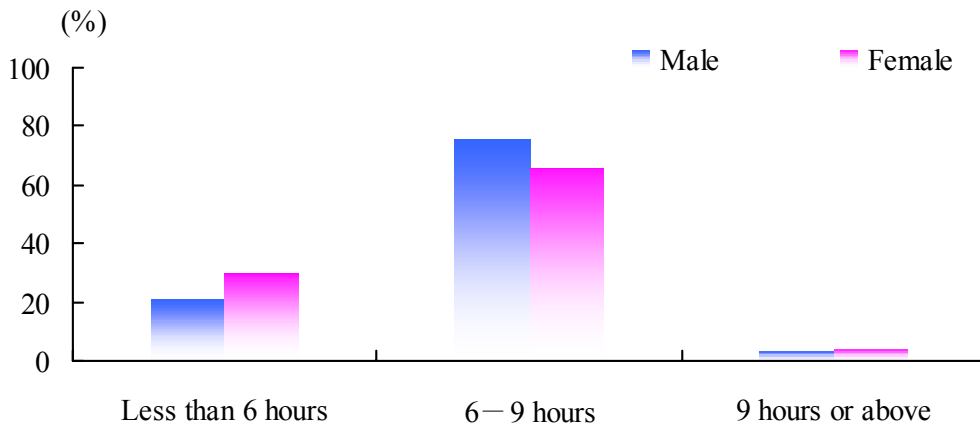


Figure 2-4-1-5 Sleeping hours between genders

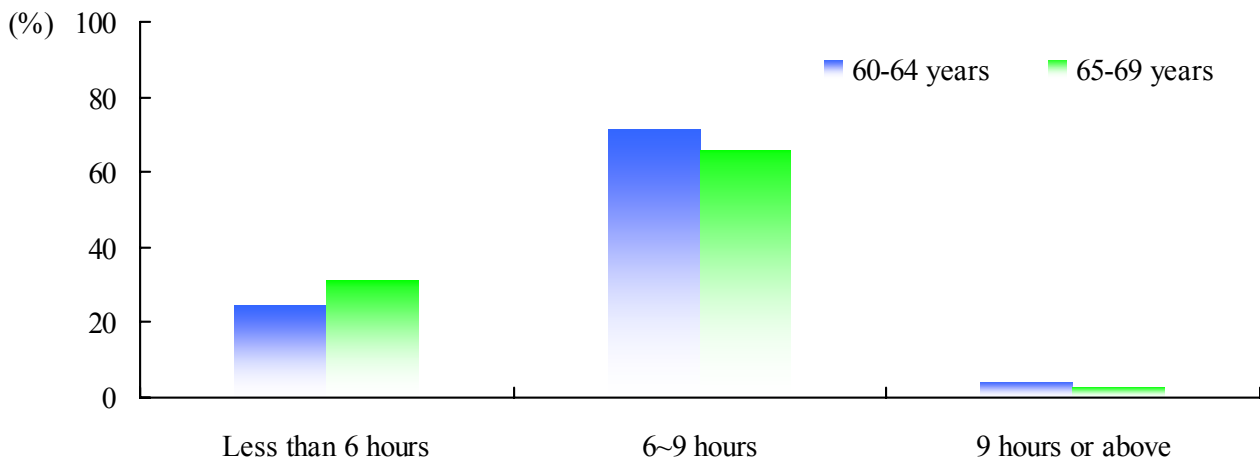


Figure 2-4-1-6 Sleeping hours among age groups

Good quality sleep refers to falling asleep quickly with a fair amount of deep sleeping time and no signs of insomnia. Among the senior subjects, 26.9 % considered themselves slept fairly well while 56 % considered themselves having an average sleeping quality. Males and females had a significant difference in sleeping quality ( $P < 0.05$ ). More males (58.0 %) than females considered themselves sleeping fairly well and having an average sleeping quality (figure 2-4-1-7 and table 3-4-2-2).

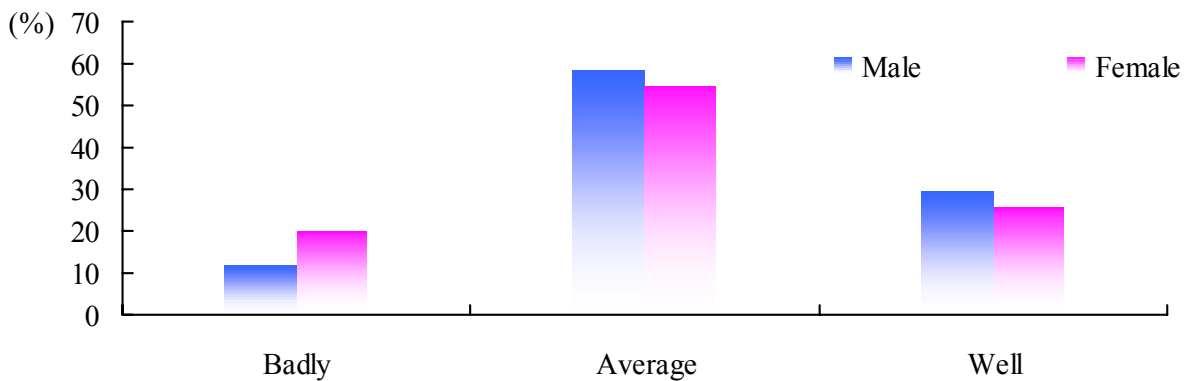


Figure 2-4-1-7 Sleeping quality between genders

The results for average daily walking hours showed that 22 % of seniors walked for less than 30 minutes, 35.9 % walked for 30~60 minutes, 24.5 % walked for 1~2 hours and 17.6 % for over 2 hours. There was no significant difference between males and females in walking hours. As age increased, more people walked longer (above 2 hours) while the proportion of seniors walking for 1~2 hours decreased (figure 2-4-1-8, 2-4-1-9 and table 3-4-2-3).

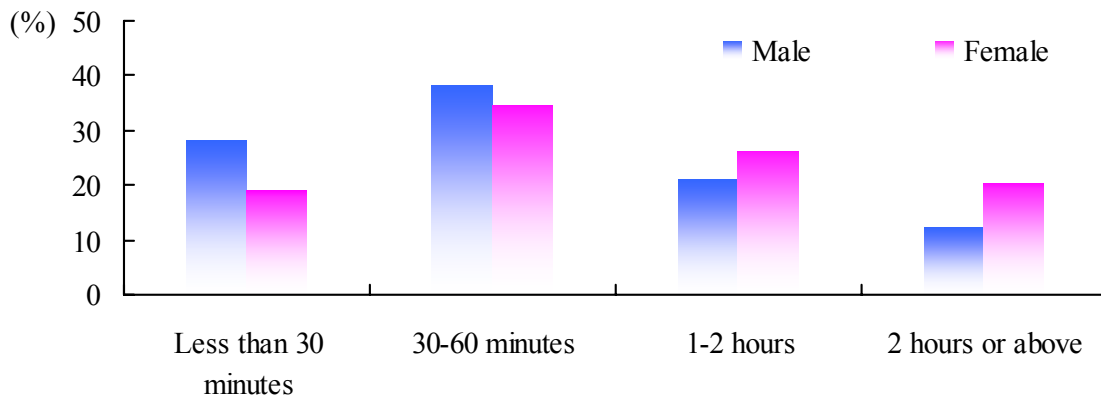


Figure 2-4-1-8 Daily walking hours between genders

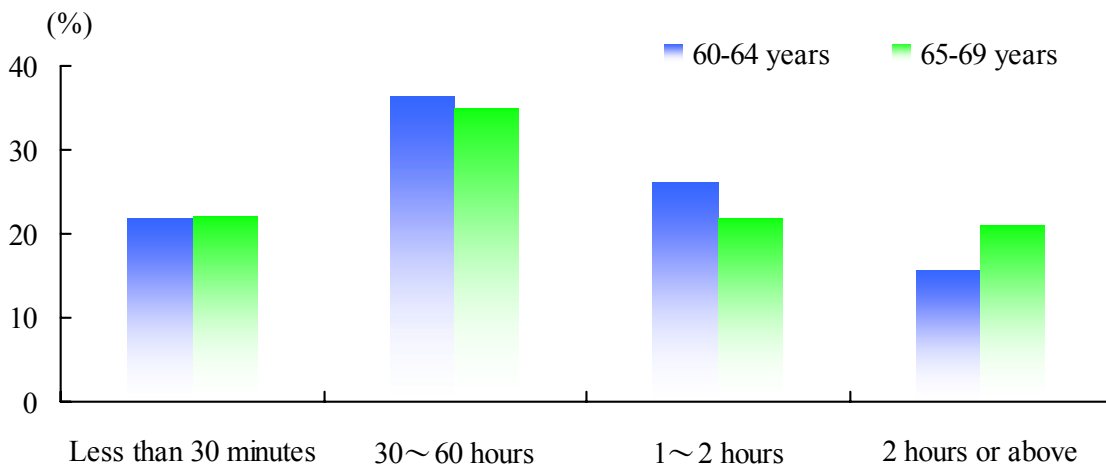


Figure 2-4-1-9 Daily walking hours among age groups

Among the senior subjects, 31.3 % sat for an average of less than 3 accumulated hours per day, 50.4 % sat for 3~6 hours, 13.5 % sat for 6~9 hours and 4.8 % sat for 9 hours or above. Overall, there was a significant difference between males and females in sitting hours ( $P < 0.01$ ). More females sat for a shorter period of time (less than 3 hours daily) ( $P < 0.01$ ) and less females sat for more than 6 hours daily compared to males ( $P < 0.01$ ). No significant difference was seen among age groups in accumulative sitting time (figure 2-4-1-10, 2-4-1-11 and table 3-4-2-4).

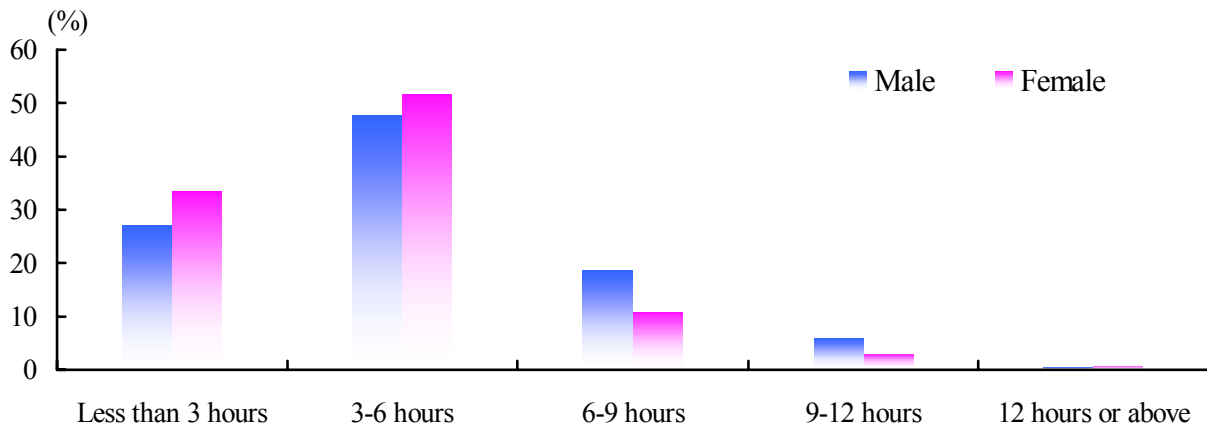


Figure 2-4-1-10 Accumulated sitting hours between genders

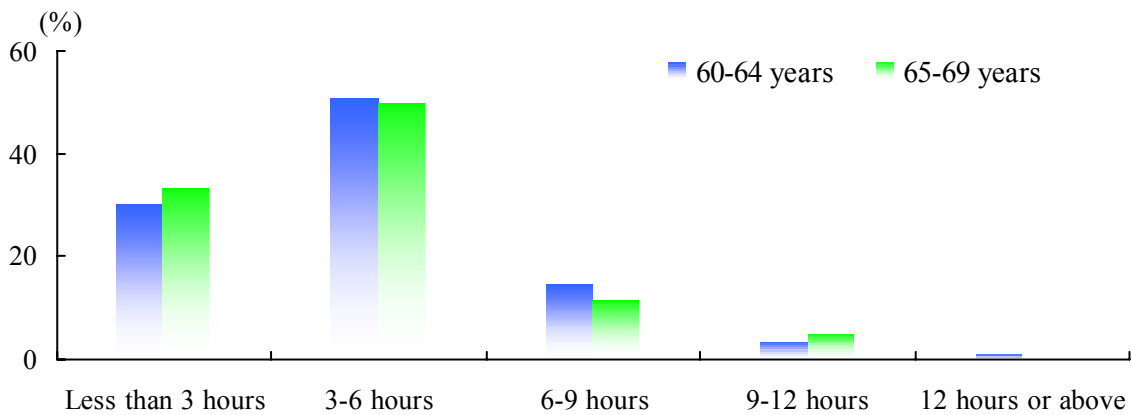


Figure 2-4-1-11 Accumulated sitting hours among age groups

Among the 591 studied seniors, only 10.8 % were current smokers or smoked previously, in which 18.8 % smoked less than 10 cigarettes daily and 21.9 % smoked 10-20 cigarettes daily. 6.3 % had quit smoking for less than 2 years and 39.2 % had quit for 2 years or more (table 3-4-2-5). Among the smokers, 78.1 % had smoked for more than 15 years. A significantly higher percentage of males (30 %) smoked compared to females (0.8 %) ( $P < 0.01$ ). The percentage of senior smokers decreased as age increased (figure 2-4-1-12 and table 3-4-2-6).

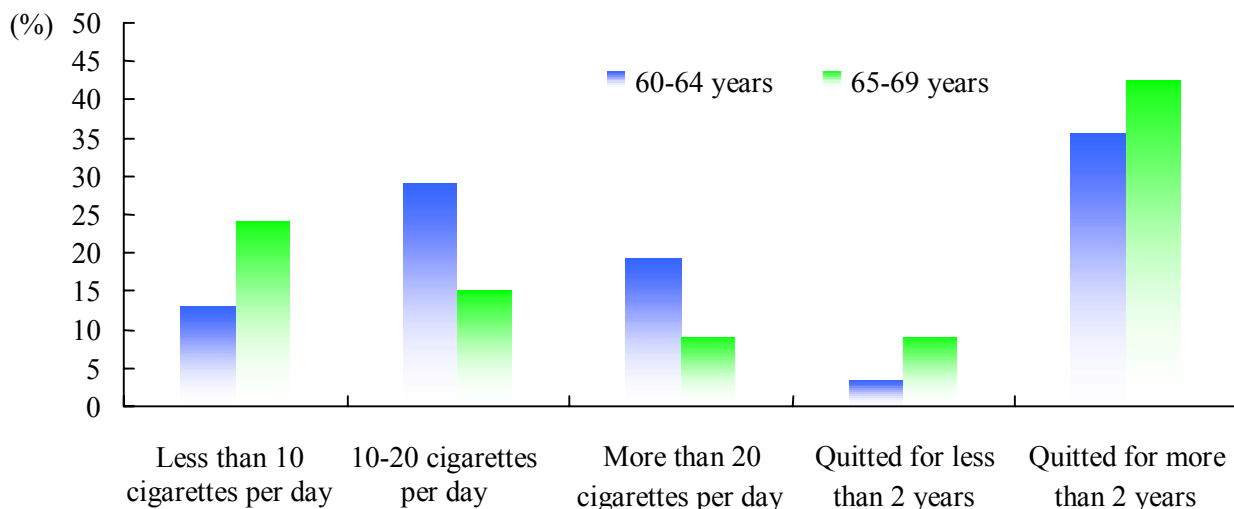


Figure 2-4-1-12 Smoking patterns among age groups

Among the subjects, 18.8 % consumed alcohol, in which 52.3 % drank once a month (occasionally), 19.8 % drank 5~7 times a week. The proportion of subjects drinking once a month was higher than drinking 5~7 times a week. The above characteristics existed between genders and age groups. The types of alcohol chosen were mainly beer (40.9 %), rice wine (6.4 %), wine or fruit wine (43.6 %) and mixed wine (6.4 %). Significant difference was found in the types of alcohol among genders ( $P < 0.01$ ); however, no difference was found among age groups. The most common alcohol drank by males was beer (57.5 %) and wine or fruit wine (78.4%) for females (figure 2-4-1-13, table 3-4-2-7, table 3-4-2-8 and table 3-4-2-9).

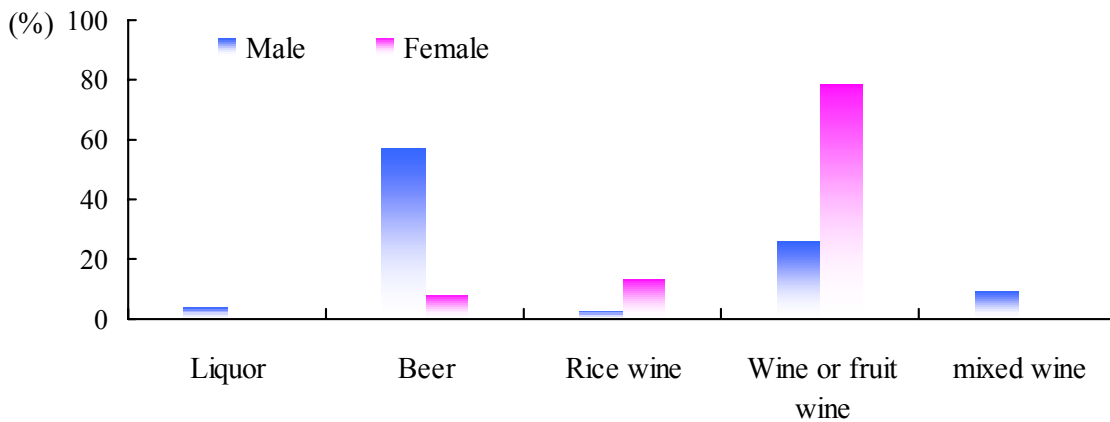


Figure 2-4-1-13 Types of alcohol consumed

Seniors spent most of their leisure time on physical exercise (50.1 %), housework (61.3 %), audio-visual entertainment (57.2 %), and social gathering (23.5 %). Males and female seniors had different activity choices during their leisure time. Males had more activities arranged during leisure time such as physical exercise (48.8 %), audio-visual entertainment (59.6 %), social gathering (24.6 %), housework (35.5 %), chess and card games (10.3 %) while females mainly focused on physical exercise (50.8 %), housework (74.7 %), audio-visual entertainment (55.9 %), and social gathering (22.9 %). Leisure activities were generally the same between different age groups (figure 2-4-1-14 and table 3-4-2-10).

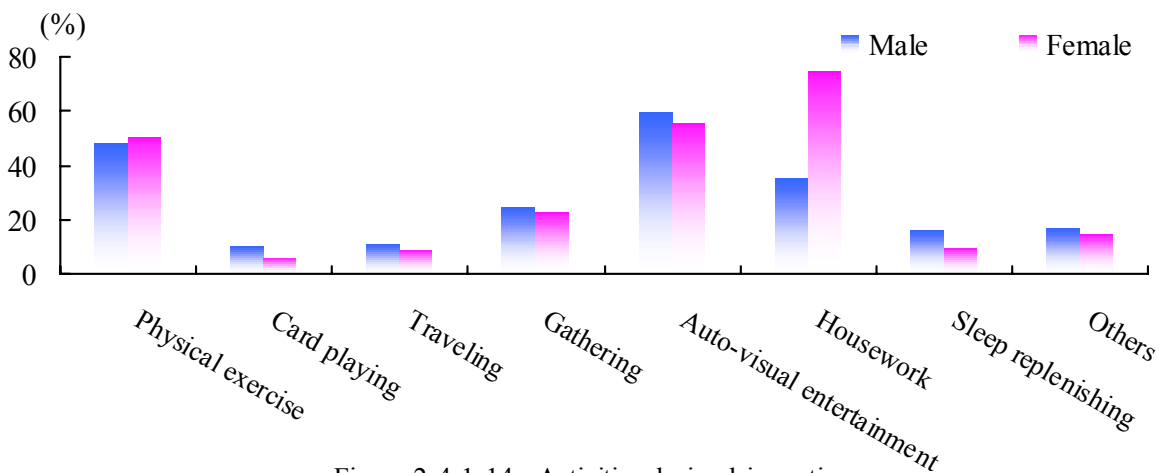


Figure 2-4-1-14 Activities during leisure time

4.1.2.2. Physical exercise

Information regarding purposes of physical exercise, major types of exercise, exercise frequency, exercise duration, persistence on exercising, perception during exercise, locations of exercise, major obstacles of exercising, and frequently watched sports events were examined in the senior subjects.

Among the studied subjects, 84.8 % participated in physical exercise. Most of the participants exercised 5 times or more per week (52.1 %), each session for more than 30 minutes (76.8 %) and had a moderate intensity level or above during exercise (60.1 %). In addition, most seniors had persisted to continuous exercising for 5 years or above (52 %), followed by 1-3 years (19.6 %), and this trend applied to both genders. The proportion of seniors who exercised 5 times a week or above increased with age ( $P < 0.05$ ). In terms of exercise intensity, the proportion was highest in moderate intensity, followed by low intensity in seniors (table 3-4-2-11, table 3-4-2-12, table 3-4-2-13 and table 3-4-2-14).

“Frequent exerciser” was defined as people who exercised 3 times or more per week, each time exercised for longer than 30 minutes with moderate exercise intensity and the study showed that 33% of seniors were frequent exercisers.

Frequent exercisers usually possessed good exercising habits and a long exercise history. 51.9 % of frequent exercisers had persisted in exercising for 5 years or more. The duration of seniors persistent to continuous exercising differed among age groups but not among genders. As age increased, the percentage of seniors persisted to exercising for 3~5 years and 5 years or more increased.

Main purposes for seniors to participate in physical exercise was to prevent and cure diseases (77.6 %), followed by to improve exercise ability (40.1 %), to relieve pressure and regulate mood (27.5 %), to socialize (19.4 %) and others (9.6 %). The purpose of physical exercise differed between males and females. The purpose of exercising for most females (80.4 %) was to prevent and cure diseases, which was higher than males (72.4 %). As age increased, subjects who desired to prevent and cure diseases by exercising increased, which accounted for 75.7 % in the 60-64 age group and 80.6 % in the 65-69 age group, an increase of 4.9% (figure 2-4-1-15, 2-4-1-16 and table 3-4-2-15).

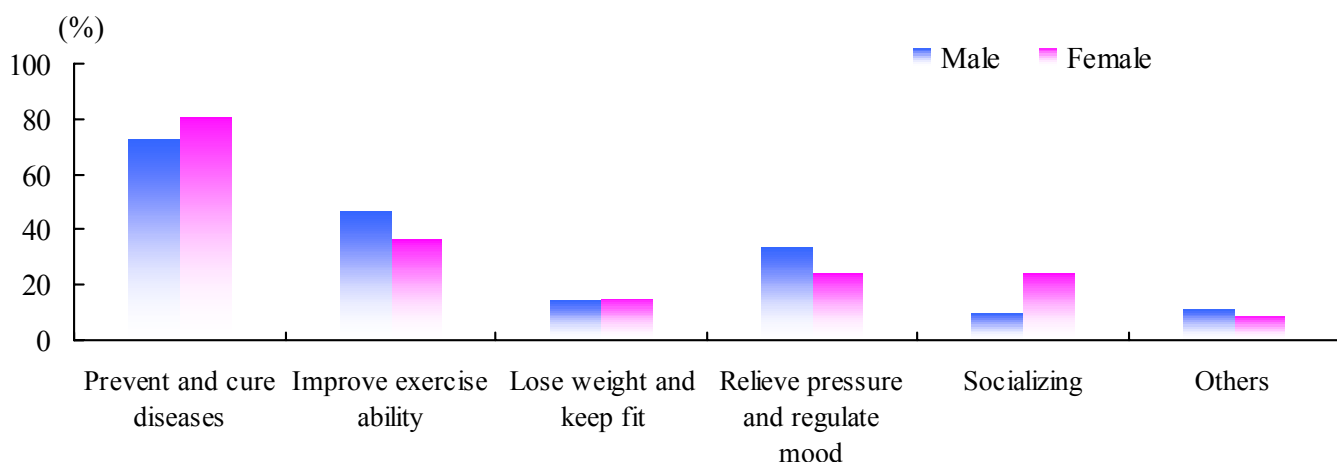


Figure 2-4-1-15 Exercise purposes between genders

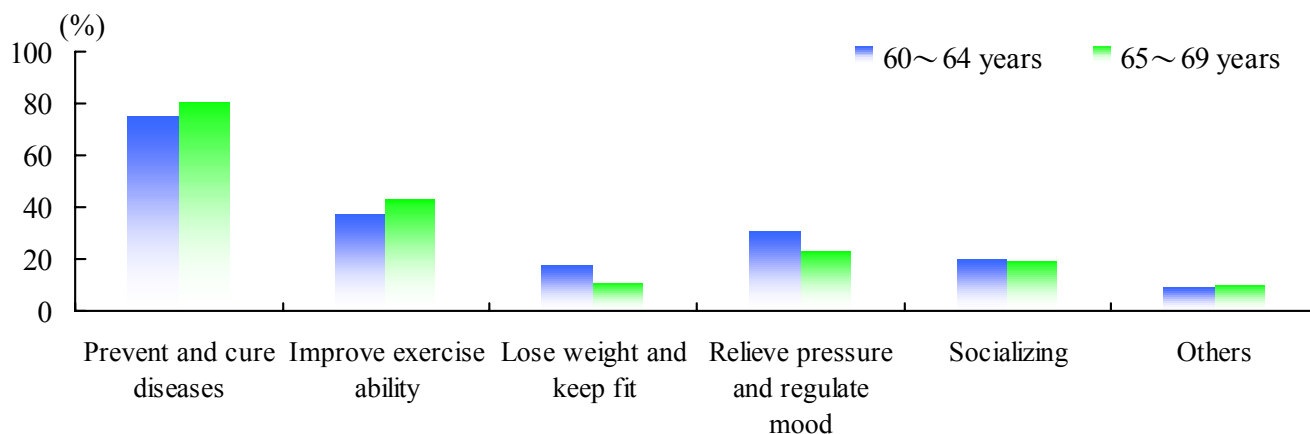


Figure 2-4-1-16 Exercise purposes among age groups

Major locations for seniors to exercise were park (68.5 %), gym and stadium (30.1 %), open area (21 %), road or street (15 %), and office or residential area (13.2 %). As age increased, the percentage of males choosing gym and stadium and open area decreased,, those choosing park increased while the percentage of females choosing gym and stadium decreased, and those choosing park and open area increased (table 3-4-2-16).

Frequent exercisers chose park, gym and stadium as their major exercise locations. Males and females chose different locations to exercise. Males usually chose park, open area, road or street, gym and stadium, while females usually chose park, gym and stadium, open area, office or residential area. As age increased, the percentage of seniors choosing park, open area, road or street to exercise increased, whereas those choosing gym, stadium, office or residential area to exercise decreased.

Major types of exercise that seniors participated in were walking (58.4 %), martial arts and qigong (32.4 %), aerobics and yangko (26.4 %), swimming (17.6%). Difference among genders in the types of exercise was found. For males, exercises participated were walking (73 %), jogging (19 %), swimming (17.2 %), work out and strength training (14.4 %), martial arts and qigong (13.8 %), hiking (12.6 %) and ball games (9.8 %). For females, exercises participated included walking (50.6 %), martial arts and qigong (42.3%), aerobics and yangko (35.3 %) and swimming (17.8 %). The percentage of seniors participated in walking increased with age, 55.9 % in the 60~64 age group and 62.2 % in the 65~69 group. As age increased, the proportion of seniors choosing jogging, swimming, hiking and biking decreased. The percentage of females participated in work out and strength training decreased to 4.3 % from 8.6 % at age 60, and males choosing ball games, martial arts and qigong decreased with different degrees. No difference in the types of exercise participated between frequent exercisers and occasional exercisers were seen (figure 2-4-1-17 and table 3-4-2-17).

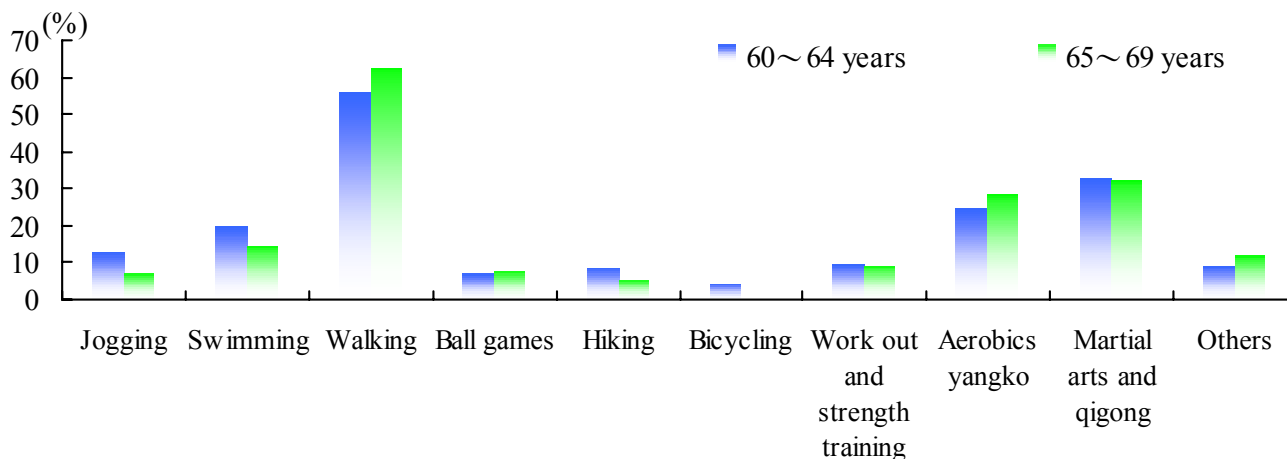


Figure 2-4-1-17 Types of exercise among age groups

Various obstacles affected seniors to exercise, among which laziness and lack of time were the major ones. The obstacles that affected both genders, both age groups and frequent exercisers to exercise were the same as above. The major obstacles that hindered non-exercisers to exercise were laziness (38.9 %), lack of time (27.8 %), without interest (25.6 %) and not necessary to exercise because of their physical weakness (21.1 %) (table 3-4-2-18).

Among the 591 senior subjects, the mostly watched sports events were football (35.6 %), followed by swimming (30.9 %), gymnastics (30.9 %), and basketball (26.4 %); the same applied to seniors of both genders and both age groups. As age increased, the proportion of females watching football, basketball, volleyball, gymnastics and swimming increased (table 3-4-2-19).

**4.1.2.3. Occurrence of diseases**

Among the subjects, 66.3 % of seniors were diagnosed with diseases. Hypertension was the most common disease (59 %), followed by others (26.0 %), diabetes (19.8 %), cardiovascular disease (14.8 %) and digestive disease (13 %). No significant difference among genders was seen in the occurrence of diseases. As age increased, the proportion of seniors diagnosed with diseases increased, in which 62 % in the 60~64 age group and 74.5 % in the 65~69 age group were diagnosed with diseases. The top three diseases diagnosed in the two age groups were hypertension, diabetes and others (table 3-4-2-20 and table 3-4-2-21).

**4.1.2.4. Understanding of the physical fitness study**

Among the senior subjects, 60.6 % of seniors had heard of the physical fitness study, and the percentages of males and females from the two age groups were similar. 35.9 % of the seniors had previously participated in the physical fitness study, and the percentage was higher in females (39.7%) than in males (28.6 %) (P<0.01). As age increased, the proportion of subjects who had previously participated in the physical fitness study decreased. As for the meaning of the study, 94.2 % seniors considered it as “to understand their fitness status”, 52.8 % considered it as “to recognize the importance of physical exercise” and 42.8 % considered it as “to improve scientific knowledge of fitness”. The



meaning of the physical fitness study was the same for both males and females of the two age groups (table 3-4-2-22 and table 3-4-2-23).

### 4.1.3. Anthropometric Measurements

#### 4.1.3.1. Length indexes

Average height and sitting height decreased slightly as age increased in both male and females. The foot length decreased slightly in males and increased slightly in females with age. The average height, sitting height and foot length ranged from 166.0~164.7 cm (males) and 153.8~153.3 cm (females), 89.0~88.4 cm (males) and 83.0~82.5 cm (females), and 24.8~24.7 cm (males) and 22.3~22.4 cm (females), respectively (table 3-4-3-1, 3-4-3-2, 3-4-3-3).

The average height, sitting height and foot length of males were significantly higher than those of the females ( $P < 0.01$ ) (figure 2-4-1-18, 2-4-1-19, and 2-4-1-20).

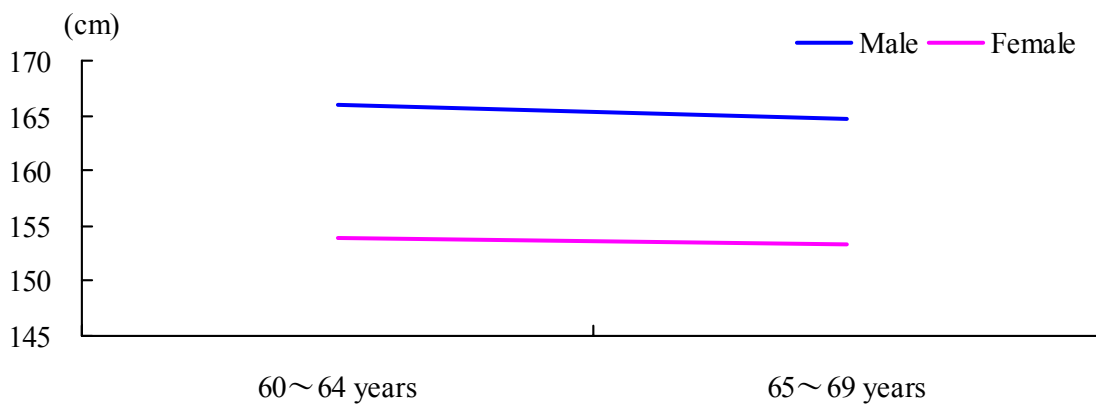


Figure 2-4-1-18 Average height of seniors

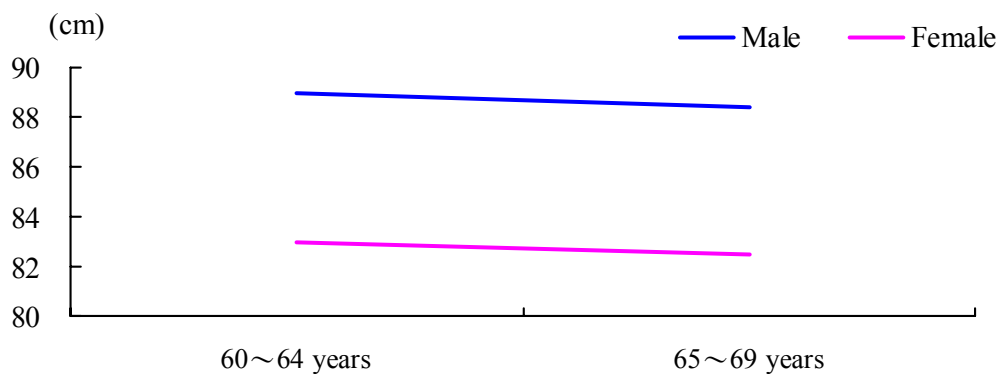


Figure 2-4-1-19 Average sitting height of seniors

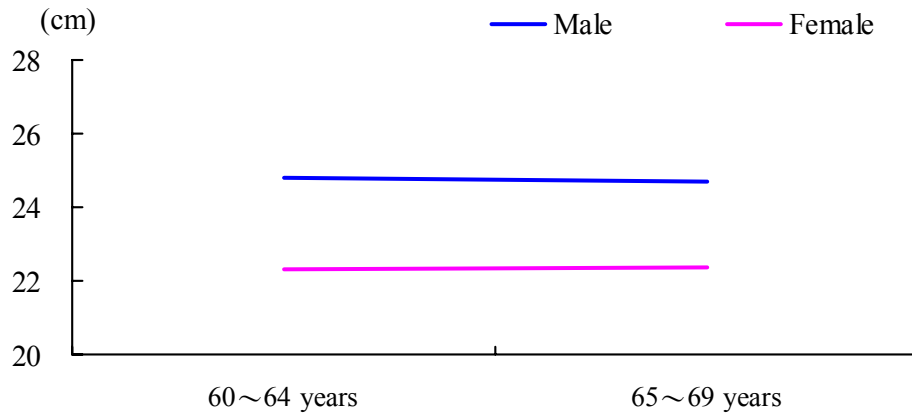


Figure 2-4-1-20 Average foot length of seniors

#### 4.1.3.2. Weight and BMI

Weight of males and females increased slightly as age increased. The average weight for males and females ranged from 65.1~66.1 kg and 55.2~56.9 kg, respectively (table 3-4-3-4).

BMI for males and females remained fairly constant and the average varied slightly as age increased. The average BMI for males and females ranged from 23.6~24.3 and 23.4~24.2, respectively (table 3-4-3-5).

The average weight of males was higher than females. The weight and BMI difference between males and females ranged from 9.2~9.9 kg and 0.2~0.1, respectively and there was no significant difference (figure 2-4-1-21 and figure 2-4-1-22).

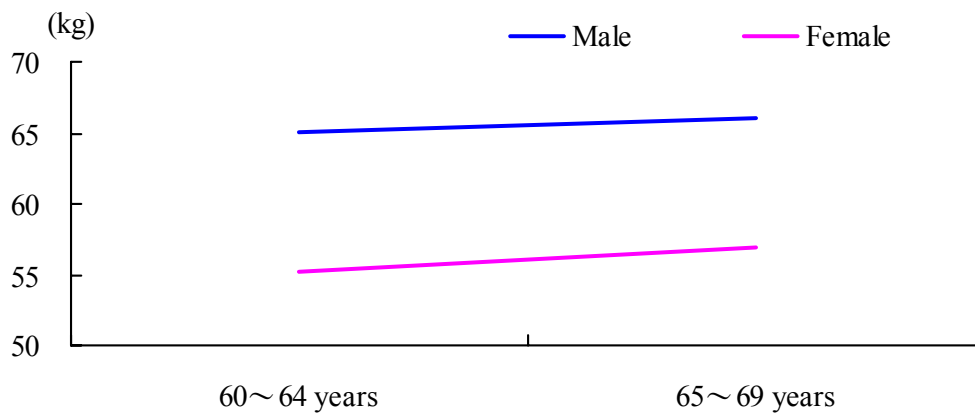


Figure 2-4-1-21 Average weight of seniors

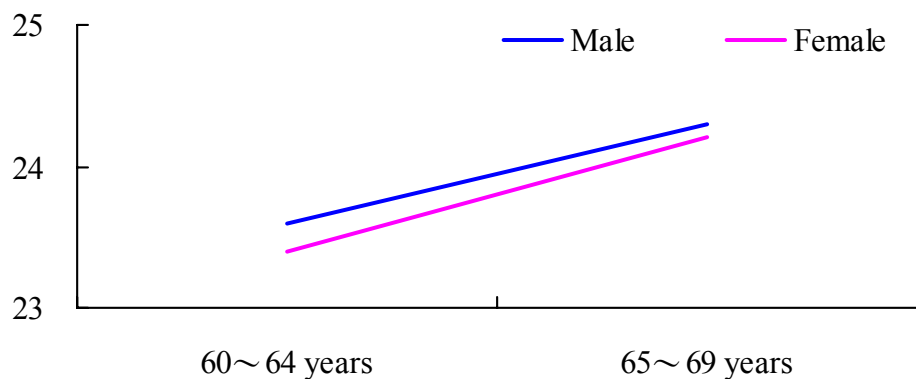


Figure 2-4-1-22 Average BMI of seniors

BMI increased with age in the 60~69 age groups. According to the recommended standard for BMI grouping by the Chinese Obesity Problem Working Team, a BMI of  $\geq 28.0$  is considered obese. The percentages of seniors with BMI  $\geq 28.0$  were 2.8 % for males and 10.7 % for females in the 60~64 age groups, 9.6 % for males and 13.5 % for females in the 65~69 age group. The rate of obesity was higher in females than males ( $P < 0.05$ ) (figure 2-4-1-23 and table 3-4-3-6).

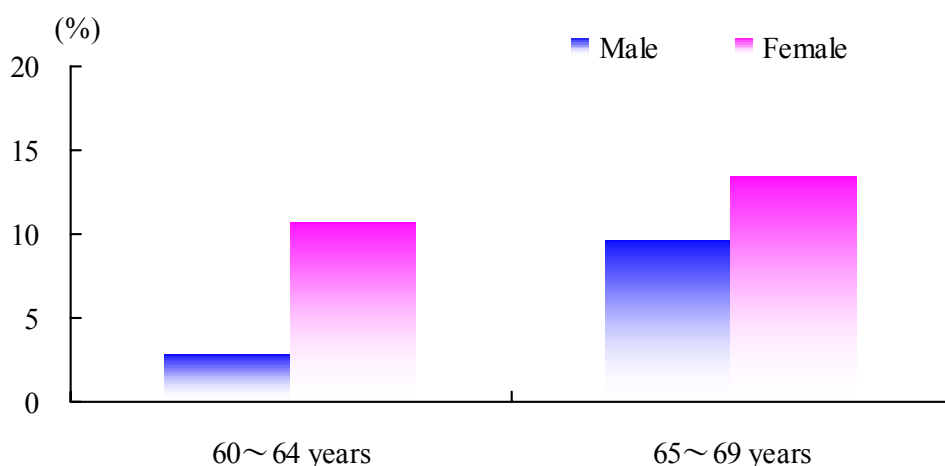


Figure 2-4-1-23 Obesity rate of seniors

#### 4.1.3.3. Circumference indexes

Average chest, waist and hip circumferences of males and females increased as age increased. The average chest, waist and hip circumferences ranged from 91.6~92.3 cm (males) and 85.8~86.8 cm (females), 86.4~89.3 cm (males) and 81.3~84.3cm (females) and 93.0~94.6 cm (males) and 90.9~91.8 cm (females), respectively (table 3-4-3-7, table 3-4-3-8 and table 3-4-3-9).

WHR of males and females increased with age, ranged from 0.929~0.943 and 0.893~0.918, respectively (table 3-4-3-10).

Significant difference among genders was observed in the chest, waist and hip circumference and WHR of males and females ( $P < 0.05$ ) (figure 2-4-1-24, figure 2-4-1-25, figure 2-4-1-26, figure 2-4-1-27).

According to the internationally recognized ACSM (American College of Sports Medicine) standard,  $WHR \geq 1.03$  for male seniors and  $\geq 0.90$  for female seniors indicate that too much fat accumulates around the waist area, which will result in a higher risk of having diseases (hypertension, type II diabetes and dyslipidemia, etc.).

In the 60~69 age group, the proportion of males with a  $WHR \geq 1.03$  ranged from 6.4~7.3 % and the proportion of females with a  $WHR \geq 0.90$  ranged from 46.7~61.1 %.

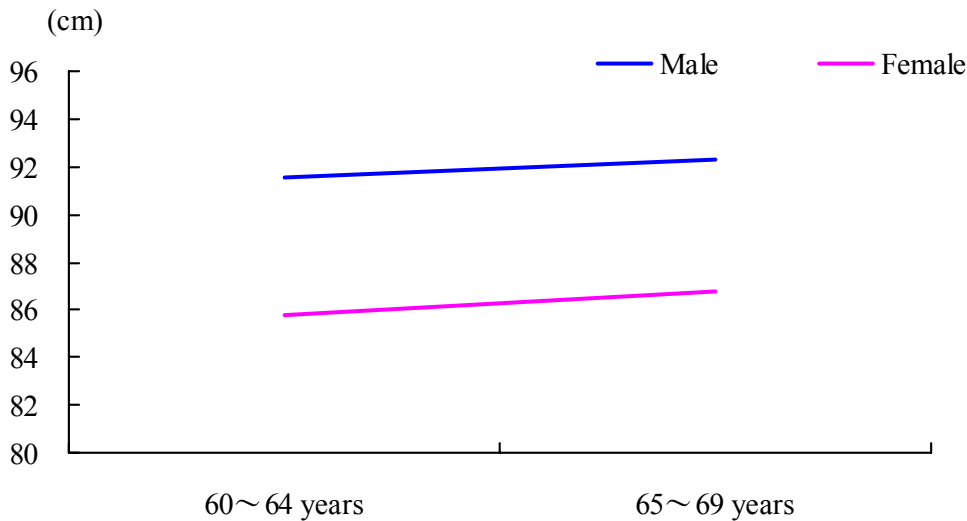


Figure 2-4-1-24 Average chest circumference of seniors

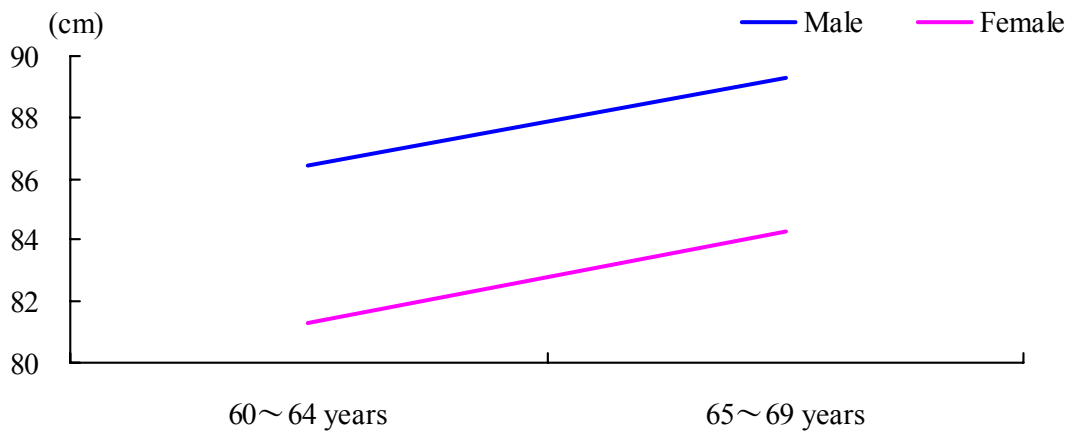


Figure 2-4-1-25 Average waist circumference of seniors

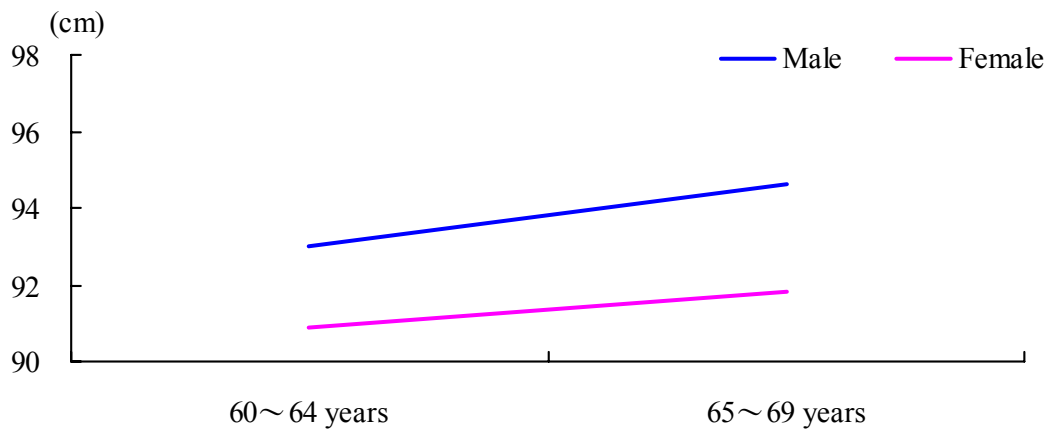


Figure 2-4-1-26 Average hip circumference of seniors

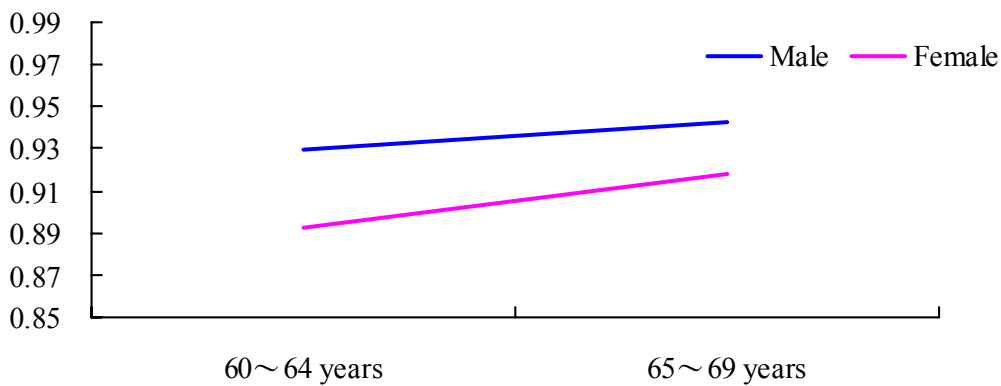


Figure 2-4-1-27 Average WHR of seniors

**4.1.3.4. Width indexes**

Average shoulder and pelvis width of males and females remained stable and varied slightly with age. The average shoulder width for males and females ranged from 36.7~36.8 cm and 34.5~34.7 cm, respectively. The average pelvis width for males and females ranged from 27.2~27.6 cm and 28.5~28.9 cm, respectively (table 3-4-3-11 and table 3-4-3-12).

The average shoulder width of males was 2.1~2.2 cm higher than females ( $P < 0.01$ ) while the average pelvis width was similar between males and females with no significant difference (figure 2-4-1-28 and figure 2-4-1-29).

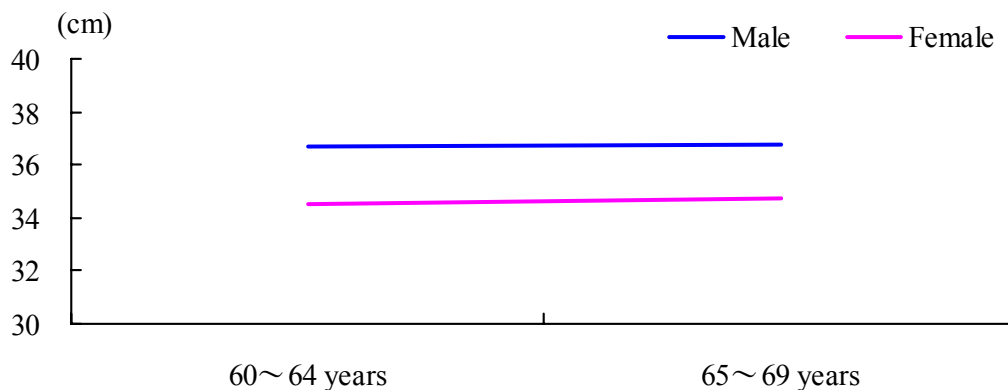


Figure 2-4-1-28 Average shoulder width of seniors

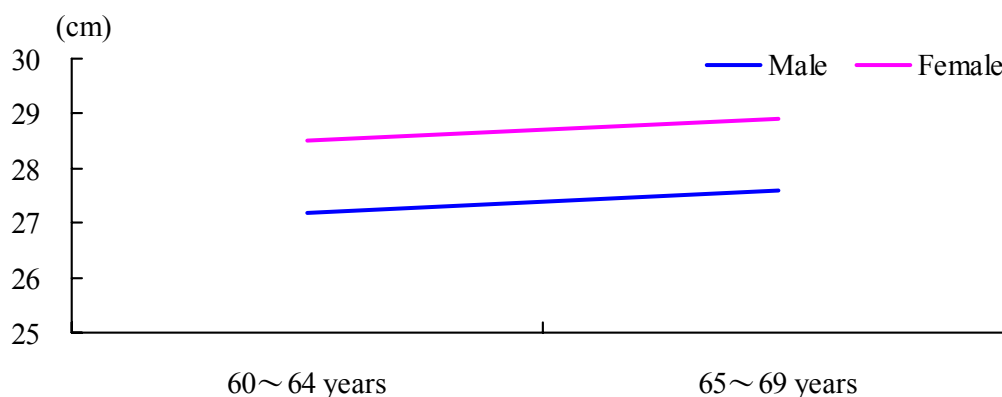


Figure 2-4-1-29 Average pelvis width of seniors

#### 4.1.3.5. Body composition

As age increased, the average skinfold thickness of the upper arm, subscapular and abdominal increased in males and females. The average skinfold thickness of the upper arm, subscapular and abdominal ranged from 9.4~11.1 mm (males) and 21.0~22.1 mm (females), 17.1~18.5 mm (males) and 19.2~20.7 mm (females) and 22.2~22.4 mm (males) and 25.8~28.1 mm (females), respectively (table 3-4-3-13, table 3-4-3-14 and table 3-4-3-15).

The average skinfold thickness of the three measuring sites was higher in females than in males, but the difference increased as age increased. The differences in the upper arm, subscapular and abdominal skinfold thickness between males and females ranged from 11~11.6 mm, 2.1~2.2 mm and 3.6~5.7 mm, respectively, with significant difference among genders ( $P < 0.01$ ) (except the subscapular skinfold thickness in the 65~69 year age group) (figure 2-4-1-30, figure 2-4-1-31 and figure 2-4-1-32).

As age increased, percentage body fat increased in males and females. Percentage body fat of males and females ranged from 16.9%~18.2% and 27.0%~28.5%, respectively. The percentage body fat of females was significantly higher than males with significant difference among genders ( $P < 0.01$ ) (figure 2-4-1-33).

Lean body mass of males and females remained stable after aging. The average lean body mass of males and females ranged from 54.1~53.8 kg and 39.9~40.2 kg, respectively (Table 3-4-3-17). Lean body

mass of males was significantly higher than females, with difference ranging from 13.6~14.2 kg ( $P < 0.01$ ) (figure 2-4-1-34).

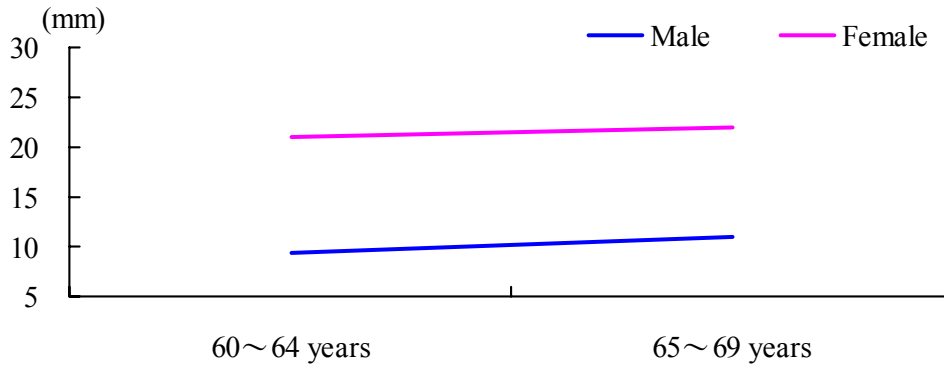


Figure 2-4-1-30 Average upper arm skinfold thickness of seniors

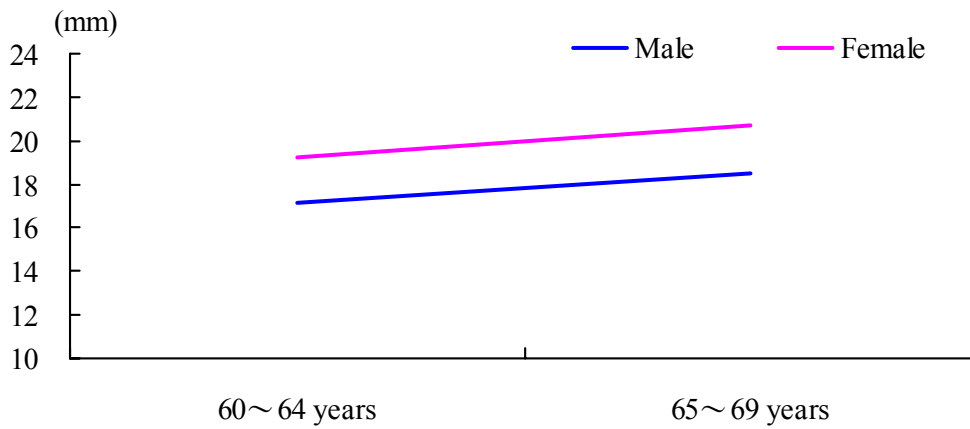


Figure 2-4-1-31 Average subscapular skinfold thickness of seniors

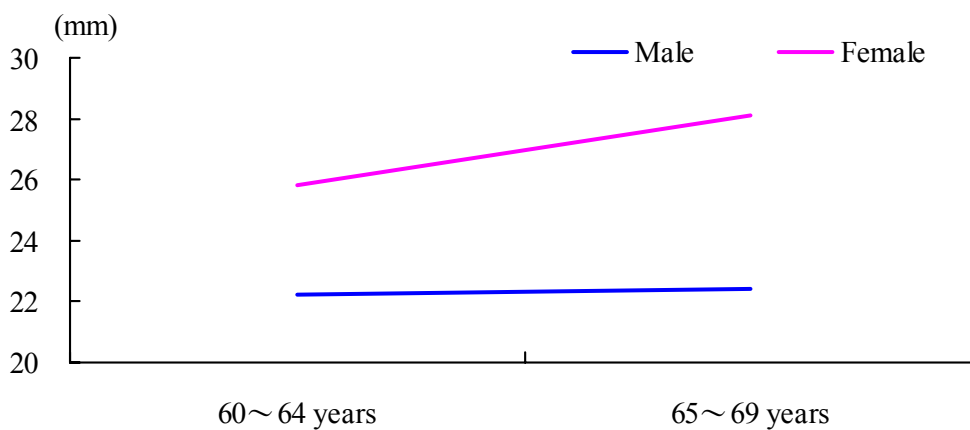


Figure 2-4-1-32 Average abdominal skinfold thickness of seniors

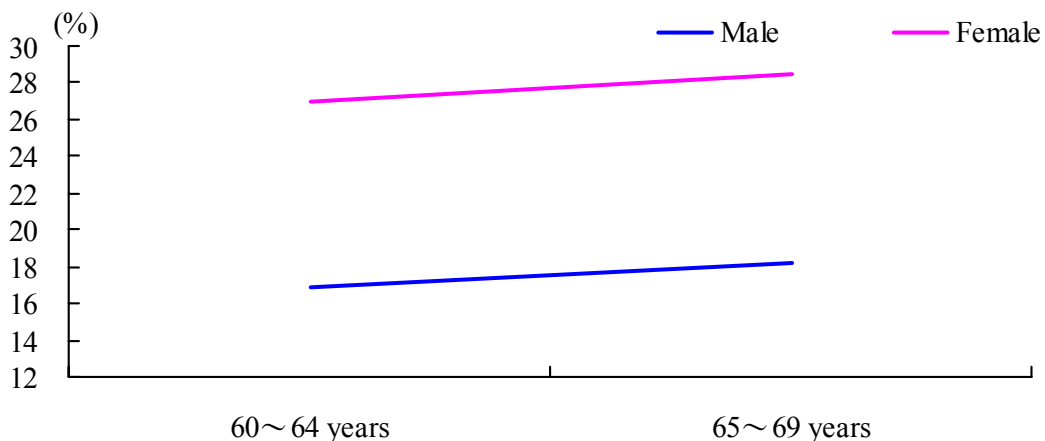


Figure 2-4-1-33 Average percentage body fat of seniors

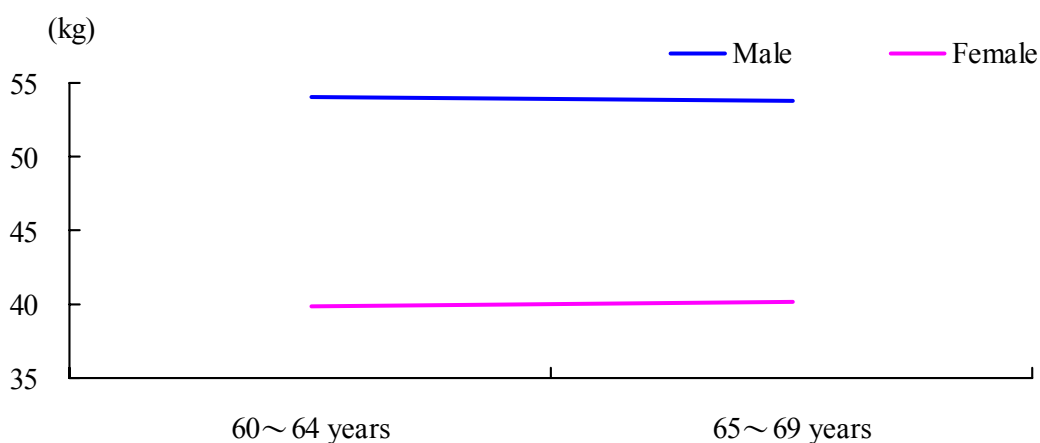


Figure 2-4-1-34 Average lean body mass of seniors

#### 4.1.4. Physiological Function

##### 4.1.4.1. Resting pulse

Average resting pulse of males and females at age 60~69 was stable as age increased, with no difference between age groups. The average resting pulse ranged from 74.4~74.7 times/minute for males and 73.2~73.9 times/minute for females with no significant difference among genders (figure 2-4-1-35 and table 3-4-4-1).

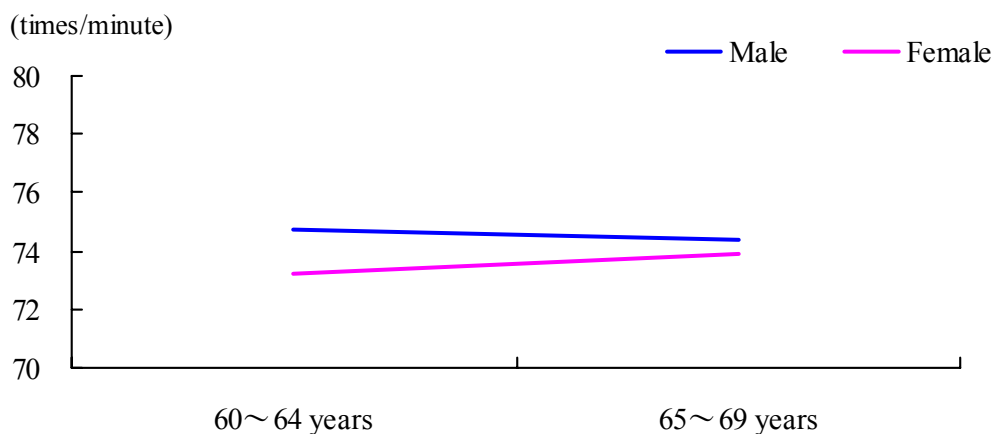


Figure 2-4-1-35 Average resting pulse of seniors



4.1.4.2. Blood pressure

In the 60~69 year age groups, the average systolic pressure of males and females was fairly stable as age increased, with no significant difference between both age groups. The average systolic pressures of males in the 60~64 and 65~69 year age groups were 131.8 mmHg and 133.4 mmHg, respectively. As for females, the systolic pressures of the 60~64 and 65~69 year age groups were 127.8 mmHg and 132.8 mmHg, respectively. The systolic pressure of males was slightly higher than females, with no significant difference. The systolic pressure of females of the 65~69 year age groups increased with an average difference of 5.0 mmHg (figure 2-4-1-36 and table 3-4-4-2).

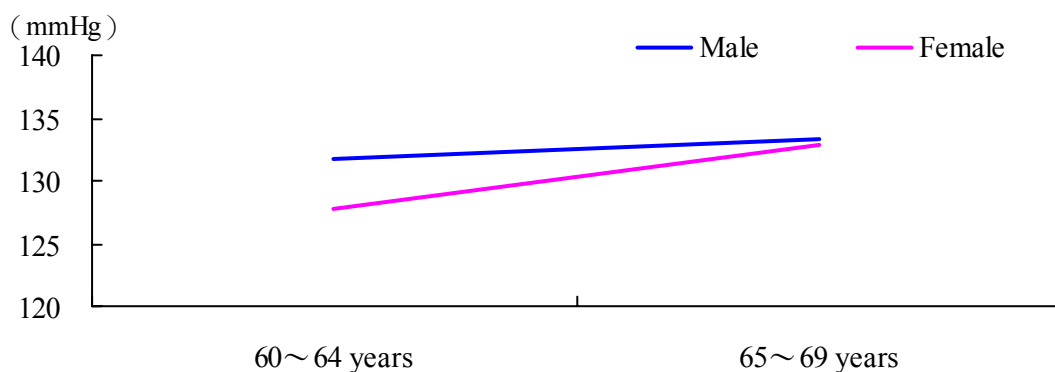


Figure 2-4-1-36 Average systolic pressure of seniors

As for diastolic pressure, the increase tended to be stable and there was no significant difference between both age groups. The average diastolic pressure of the 60~64 and 65~69 year age groups in males were 80.1 mmHg and 77.6 mmHg, respectively and were 76.9 mmHg and 77.9 mmHg in females, respectively. No significant difference among genders was observed (figure 2-4-1-37 and table 3-4-4-3).

The average pressure difference tended to increase slowly as age increased, but was of no significant difference between age groups. The average pressure differences of the 60~64 and 65~69 year age groups in males were 51.6 mmHg and 55.9 mmHg, respectively and were 50.9 mmHg and 54.8 mmHg in females, respectively. Males had a slightly higher pressure difference, but no significant difference among genders was found (figure 2-4-1-38 and table 3-4-4-4).

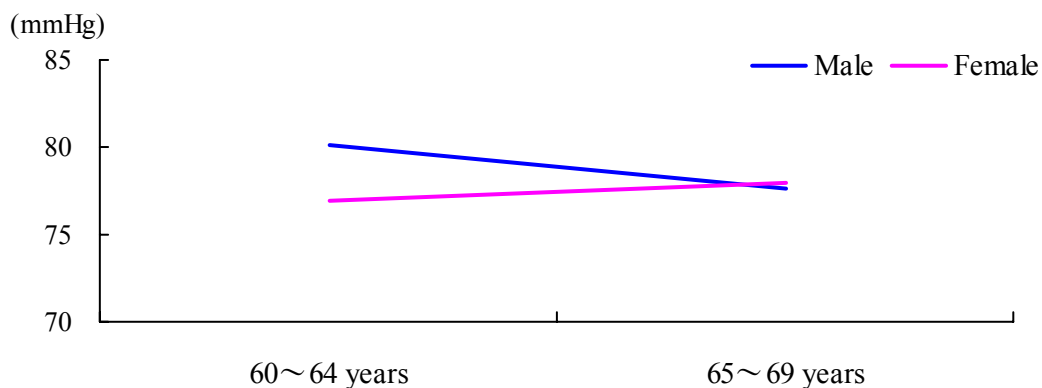


Figure 2-4-1-37 Average diastolic pressure of seniors

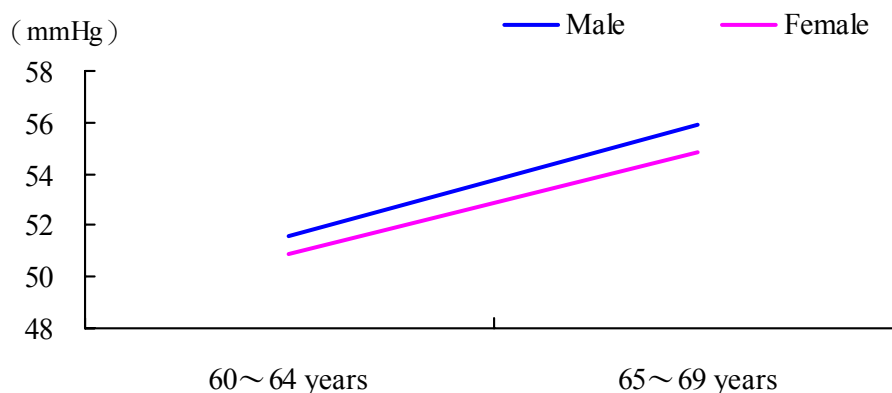


Figure 2-4-1-38 Average pressure difference of seniors

#### 4.1.4.3. Vital capacity

Average vital capacity of males and females at age 60~69 decreased significantly as age increased. Comparison between both age groups showed that the average vital capacity decreased by 326.8 ml in males and decreased by 78.8 ml in females. The difference between the two age groups was significant ( $P < 0.01$ ). The average vital capacity of the 60~64 and 65~69 year age groups in males were 2998.2 ml and 2671.4 ml, respectively and were 1896.2 ml and 1817.4 ml in females, respectively. The vital capacities of males were 1102.0 ml and 854.0 ml higher than females in the 60~64 and 65~69 year age groups, respectively. Significant difference among genders in vital capacity was found ( $P < 0.01$ ) (figure 2-4-1-39 and table 3-4-4-5).

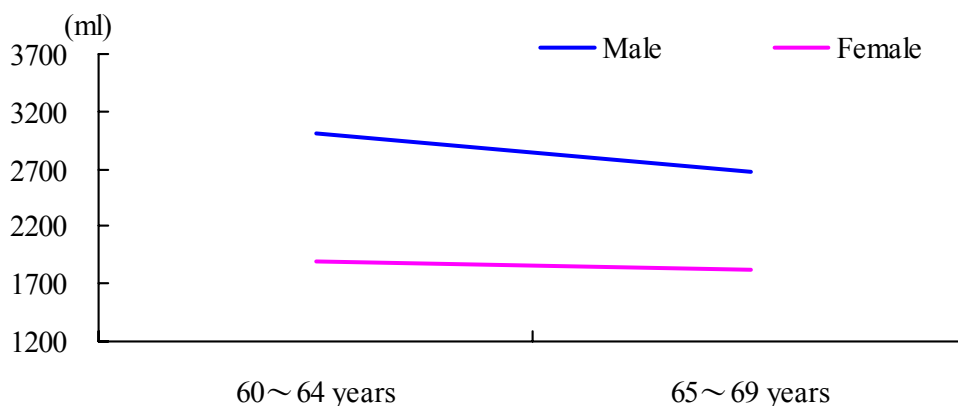


Figure 2-4-1-39 Average vital capacity of seniors

Average vital capacity/weight tended to decrease as age increased. The average vital capacity/weight of males was 46.5 ml/kg and 41.1 ml/kg in the 60~64 and 65~69 year age groups, respectively, with a significant difference between both age groups ( $P < 0.05$ ). The average vital capacity/weight of females was 35.1 ml/kg and 32.7ml/kg in the 60~64 and 65~69 age groups, respectively, with no significant difference between both age groups. Males had a slightly higher vital capacity compared to females, and the difference was significant ( $P < 0.01$ ) (figure 2-4-1-40 and table 3-4-4-6).

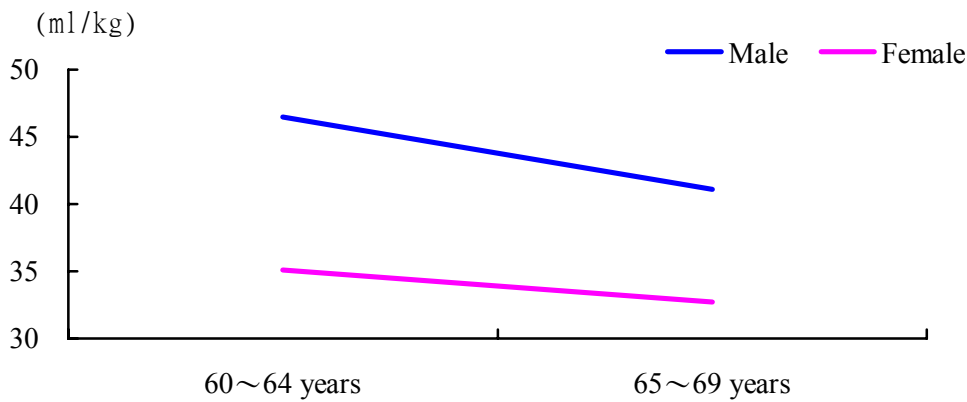


Figure 2-4-1-40 Average vital capacity/weight of seniors

#### 4.1.5. Physical Fitness

##### 4.1.5.1. Strength

Grip strength was used to reflect strength.

In the 60-69 year age groups, the average grip strength for males and females decreased as age increased. Comparison between the 60~64 to the 65~69 year age groups showed that grip strength decreased by 1.4 kg ( $P < 0.05$ ). The average grip strength ranged from 36.1~34.7 kg for males and there was no decrease for females in the two age groups. The average grip strength ranged from 20.2~20.5 Kg in the two age groups. Compared within the same age group, males had a significantly higher grip strength than females ( $P < 0.05$ ) with a difference of 15.9 kg and 14.2 kg in the 60~64 and 65~69 year age groups, respectively (figure 2-4-1-41 and table 3-4-5-1).

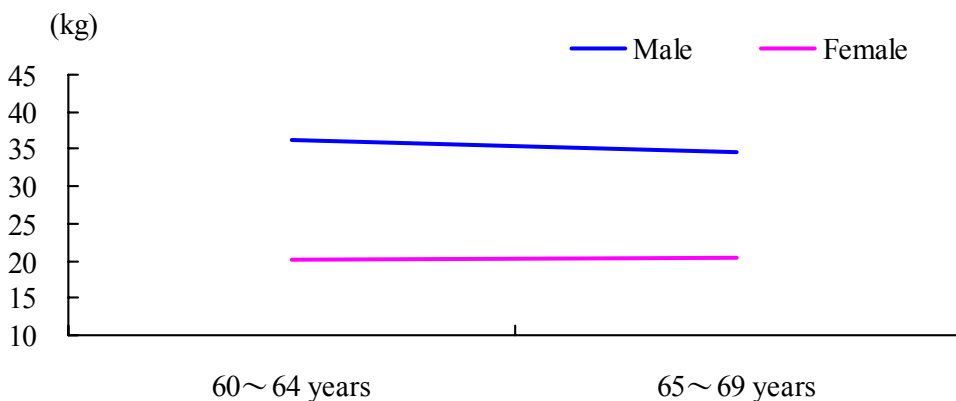


Figure 2-4-1-41 Average grip strength of seniors

##### 4.1.5.2. Flexibility

Sit and reach was used to reflect flexibility.

In the 60-69 year age groups, the average sit and reach for males and females tended to decrease slowly as age increased. Comparison between the 60~64 and 65~69 year age groups showed that flexibility index decreased by 1.4 cm for males, and average sit and reach increased as age increased by

1.2 cm in females. Average sit and reach ranged from -0.9~2.3 cm for males and 6.3~7.5 cm for females in both age groups. Comparison of the same age group showed that females had a significantly higher flexibility index than males ( $P < 0.01$ ); with 7.2 cm and 9.8 cm difference in the 60~64 and 65~69 year age groups, respectively (figure 2-4-1-42 and table 3-4-5-2).

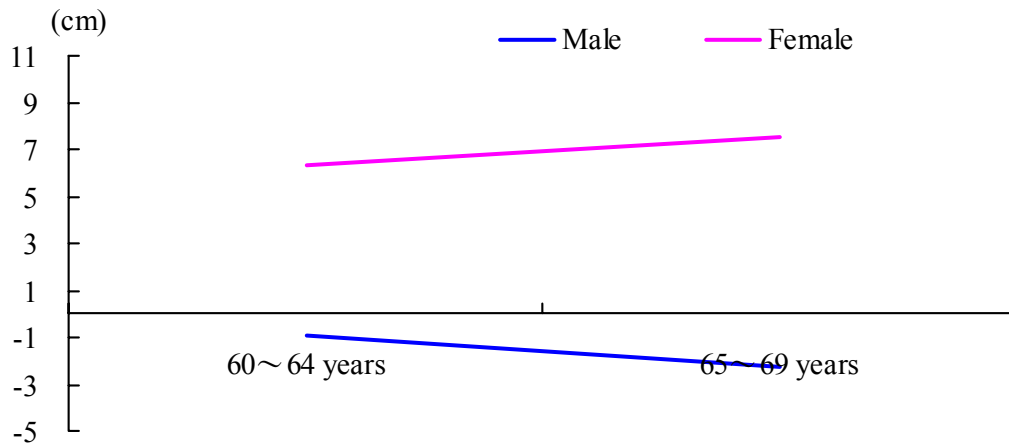


Figure 2-4-1-42 Average sit and reach of seniors

#### 4.1.5.3. Respond

Respond time was used to reflect respond ability.

In the 60~69 year age groups, the average respond time increased apparently with age, especially in females. Comparison between the 60~64 and 65~69 year age groups showed that the respond time of males increased by 0.03 seconds while females increased by 0.08 seconds. The average respond time ranged from 0.48~0.51 seconds for males and 0.55~0.63 seconds for females. The response ability was better in males than females ( $P < 0.01$ ) (figure 2-4-1-43 and table 3-4-5-3).

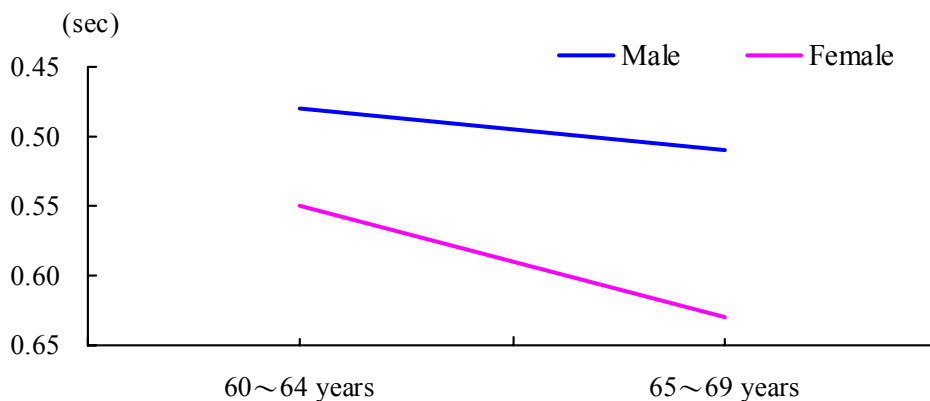


Figure 2-4-1-43 Average respond time of seniors

4.1.5.4. Balance

One foot stands with eyes closed (OFSEC) was used to reflect balance.

In the 60~69 year age groups, the average OFSEC for males and females decreased slowly as age increased. Comparison between the 60~64 and 65~69 year age groups showed that OFSEC decreased by 4.7 seconds in males and 2.8 seconds in females. The average OFSEC ranged from 14.4~9.7 seconds for males and 10.2~7.4 seconds for females. Comparison within the same age group showed that males had a better balance ability than females ( $P < 0.05$ ) (figure 2-4-1-44 and table 3-4-5-4).

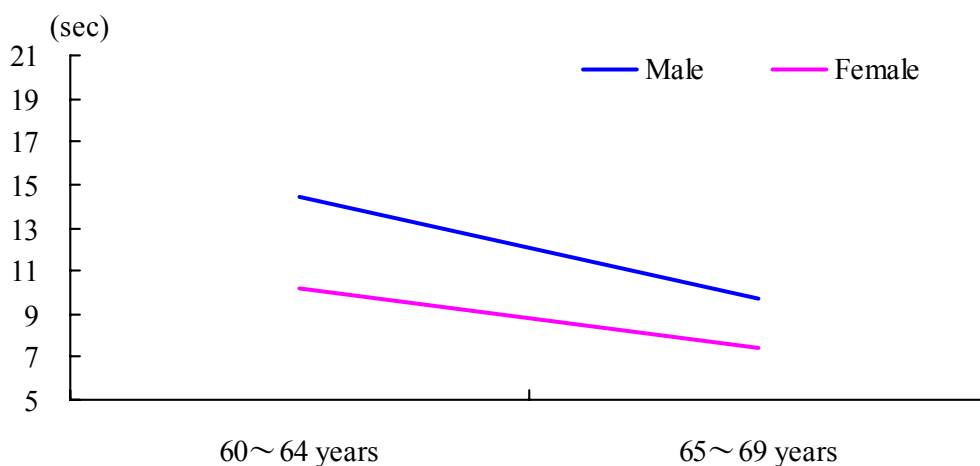


Figure 2-4-1-44 Average one foot stands with eyes closed (OFSEC) of seniors

4.2. Comparison of 2005 and 2010 Results on the Physical Fitness Study of Macao Seniors

In order to discover and comprehend the changes and current patterns of the physical status of Macao seniors, to master their physical fitness and development trend, and to provide scientific evidence in the assessment of their health, comparative analysis was carried out on the anthropometric, physiological function and physical fitness indexes of seniors in the 60~69 age groups based on the data of 2005 and 2010 physical fitness study of Macao seniors.

4.2.1. Comparison of Basic Information of the Subjects

In 2005 and 2010, seniors in the 60~69 year age groups were studied. The characteristics of the samples were basically similar in the two studies (table 2-4-2-1 and table 2-4-2-2).

Table 2-4-2-1 Comparison of basic characteristics in seniors

Characteristics	2005	2010
Source	7 communities in Macao	7 communities in Macao
Age range	60-69 years	60-69 years
Group	differed by 5 years with 2 age groups	differed by 5 years with 2 age groups
Category	Male and female	Male and female
Sampling principle	stratified, random and cluster sampling	stratified, random and cluster sampling
Number of samples	486	591

**Table 2-4-2-2 Comparison of senior sampling size per community**

Year	Community	60-64 years	65-69 years	Total
2005	S. Francisco	5	9	14
	Na. Sra. do Carmo	29	32	61
	Paróquia de S. Lourenço	31	19	50
	Paróquia da Sé Catedral	28	25	53
	Paróquia de Santo António	54	47	101
	Paróquia de S. Lázaro	23	20	43
	Paróquia de Nossa Sra. de Fátima	85	79	164
	<b>Total</b>	<b>255</b>	<b>231</b>	<b>486</b>
2010	S. Francisco	3	1	4
	Na. Sra. do Carmo	56	29	85
	Paróquia de S. Lourenço	47	29	76
	Paróquia da Sé Catedral	42	22	64
	Paróquia de Santo António	80	68	148
	Paróquia de S. Lázaro	42	19	61
	Paróquia de Nossa Sra. de Fátima	101	52	153
	<b>Total</b>	<b>371</b>	<b>220</b>	<b>591</b>

#### 4.2.2. Comparison of Lifestyle

Among seniors (aged 60-69), 4 aspects were studied: lifestyle, physical exercise, occurrence of diseases and the understanding of physical fitness study, and the comparison of results were shown as follows.

##### 4.2.2.1. Habits

For habits, information regarding the following 9 areas was examined: sleeping hours, sleeping quality, accumulative daily walking hours, daily sitting hours, smoking, smoking history, drinking history, drinking frequency and types of alcohol.

Study results showed that, compared with the results in 2005 study, statistical significance was found in the sleeping hours for seniors in the 60-69 year age groups in 2010 ( $P < 0.01$ ). Proportion of males sleeping for less than 6 hours increased by 7.8 %, seniors sleeping for 6~9 hours decreased by 3.3 % and those sleeping for over 9 hours decreased by 4.6 %. Compared with the results in 2005, the proportion of females sleeping for less than 6 hours increased by 3.2%, sleeping for 6~9 hours decreased by 1.1%, and sleeping for over 9 hours decreased by 2.0% in 2010 (table 2-4-2-3).

**Table 2-4-2-3 Comparison of sleeping hours in seniors (%)**

Sleeping hours	M			F		
	2005	2010	Difference	2005	2010	Difference
Less than 6 hours	13.5	21.3	7.8**	26.9	30.1	3.2**
6—9 hours	78.5	75.2	-3.3	67.1	66.0	-1.1
9 hours or more	8.0	3.4	-4.6**	5.9	3.9	-2.0**

Note: difference equaled to the data in 2010 minus the data in 2005, and this also apply to the following. \*\*

$P < 0.01$ , \*  $P < 0.05$

In terms of sleeping quality, when results were compared with that in 2005, no significant difference was found in males. However, some differences were seen in females as revealed by the results that the proportion of seniors with average sleeping quality increased by 10.8%, and the proportion of seniors with satisfactory sleeping quality decreased by 9.4% (table 2-4-2-4).

**Table 2-4-2-4 Comparison of sleeping quality in seniors (%)**

Sleeping quality	M			F		
	2005	2010	Difference	2005	2010	Difference
Bad	13.0	11.8	-1.2	21.3	19.8	-1.5
Average	58.0	58.6	0.6	43.8	54.6	10.8
Good	29.0	29.6	0.6	34.9	25.5	-9.4

The study results indicated that significant difference was seen in average daily accumulative walking hours for seniors in 2010 and 2005 ( $P < 0.01$ ). Compared with the results in 2005, the proportion of males with accumulative daily walking hours less than 30 minutes increased by 18.6%, within 30-60 minutes increased by 9.4%, within 1-2 hours decreased by 10.8 %, and over 2 hours decreased by 17.2%. The proportion of females with accumulative daily walking hours less than 30 minutes increased by 11.5 %, and those over 2 hours decreased by 10.7 % (table 2-4-2-5).

**Table 2-4-2-5 Comparison of daily walking hours in seniors (%)**

Accumulative daily walking hours	M			F		
	2005	2010	Difference	2005	2010	Difference
Less than 30 minutes	9.5	28.1	18.6**	7.3	18.8	11.5**
30—60 minutes	29.0	38.4	9.4**	31.8	34.5	2.7
1—2 hours	32.0	21.2	-10.8**	29.7	26.3	-3.4
2 hours or more	29.5	12.3	-17.2**	31.1	20.4	-10.7**

In general, no significant difference was found in the daily sitting hours in 2010 when compared with the results in 2005. The proportion of males with daily sitting hours within 3-6 hours decreased by 5.7 % and those within 6-9 hours increased by 3.2 %. For all other indexes and for the proportion of daily sitting hours in females, no significant change was seen (table 2-4-2-6).

**Table 2-4-2-6 Comparison of daily sitting hours in seniors (%)**

Sitting hours	M			F		
	2005	2010	Difference	2005	2010	Difference
Less than 3 hours	25.0	27.1	2.1	33.9	33.5	-0.4
3-6 hours	53.5	47.8	-5.7	52.4	51.8	-0.6
6—9 hours	15.5	18.7	3.2	11.5	10.8	-0.7
9—12 hours	4.0	5.9	1.9	1.7	3.1	1.4
12 hours or more	2.0	0.5	-1.5	0.3	0.8	0.5

In terms of smoking, significant difference in smoking was found in 2010 in males when compared with 2005 study ( $P < 0.01$ ), where there was no significant difference in females. The proportion of males who never smoked increased by 11.0 %, those smoking less than 10 cigarettes a day decreased by 6.1 %, those who smoked 10-20 cigarettes a day decreased by 8.1 %. This showed that some of the seniors had

realized the harm of smoking to human health and reduced the amount of smoking. The study also indicated that there were changes in smoking duration for males, as revealed by the significant difference in the proportion of those who had smoked for 10~15 years, which had increased by 6.6 % in 2010 compared with that in 2005 (table 2-4-2-7 and table 2-4-2-8).

**Table 2-4-2-7 Comparison of cigarette consumption in seniors (%)**

Cigarette consumption	M			F		
	2005	2010	Difference	2005	2010	Difference
Never	59.0	70.0	11.0	96.5	99.2	2.7
Less than 10 cigarettes per day	11.5	5.4	-6.1**	1.7	0.3	-1.4
10~20 cigarettes per day	15.0	6.9	-8.1**	1.4	0.0	-1.4
20 cigarettes or more per day	1.5	4.4	2.9*	0.3	0.0	-0.3
Quitted smoking for less than 2 years	2.0	1.5	-0.5	0.0	0.3	0.3
Quitted smoking for 2 years or more	11.0	11.8	0.8	0.0	0.3	0.3

**Table 2-4-2-8 Comparison of smoking duration in seniors (%)**

Smoking years	M			F		
	2005	2010	Difference	2005	2010	Difference
Less than 5 years	2.4	4.9	2.5	10.0	0.0	-10.0
5–10 years	3.7	6.6	2.9	0.0	0.0	0.0
10–15 years	4.9	11.5	6.6*	0.0	0.0	0.0
15 years or more	89.0	77.0	-12.0	90.0	100.0	10.0

In 2010, no significant difference was seen in the proportion of seniors in drinking when results were compared with the 2005 study, but there was a decrease in drinking frequency in males and females. The proportion of seniors who consumed alcohol 5~7 times a week decreased by 9.0 % in males and 7.9 % in females, and the proportion of females who consumed alcohol once a month increased by 15.9 % (table 2-4-2-9 and table 2-4-2-10).

**Table 2-4-2-9 Comparison of alcohol consumption in seniors (%)**

Alcohol consumption	M			F		
	2005	2010	Difference	2005	2010	Difference
Yes	36.0	36.5	0.5	10.1	9.5	-0.6
No	64.0	63.5	-0.5	89.9	90.5	0.6

**Table 2-4-2-10 Comparison of drinking frequency in seniors (%)**

Frequency of drinking	M			F		
	2005	2010	Difference	2005	2010	Difference
Once a month	43.1	44.6	1.5	51.7	67.6	15.9**
1–2 times per week	19.4	27.0	7.6*	24.1	8.1	-16.0**
3–4 times per week	6.9	6.8	-0.1	0.0	8.1	8.1*
5–7 times per week	30.6	21.6	-9.0*	24.1	16.2	-7.9*



Significant difference was seen in the types of alcohol that the subjects frequently drank ( $P<0.01$ ). More males drank beers with an increased of 11.7 %, the proportion of those drinking liquor decreased by 5.6 %, and those drinking rice wine decreased by 12.6 %. Compared of 2010 and 2005 results showed that the proportion of female drinking rice wine decreased by 31.1 %, and there was an increase of 54.3 % in those drinking wine or fruit wine and a decrease of 17.2 % in those drinking mixed wine in 2010 (table 2-4-2-11).

**Table 2-4-2-11 Comparison of alcohol preference in seniors (%)**

Types of alcohol	M			F		
	2005	2010	Difference	2005	2010	Difference
Liquor	9.7	4.1	-5.6	0.0	0.0	0.0
Beer	45.8	57.5	11.7**	6.9	8.1	1.2
Rice wine	15.3	2.7	-12.6 **	44.8	13.5	-31.3 **
Wine or fruit wine	19.4	26.0	6.6	24.1	78.4	54.3 **
Mixed	9.7	9.6	-0.1	17.2	0.0	-17.2

**4.2.2.2. Physical exercise**

The study of physical exercise included: activities during leisure time, frequently watched sports, the purposes of doing physical exercise, major types of exercise, exercise frequency, exercise duration, persistence on exercising, main locations of exercise, and major obstacles of exercising.

Study results showed that no significant difference was found in the activities during leisure time in general for seniors in 2010 and 2005. However, a decrease was seen in the proportion of male and female seniors in chess or poker, social gathering and doing house work (table 2-4-2-12).

**Table 2-4-2-12 Comparison of activities during leisure time in seniors (%)**

Activities during leisure time	M			F		
	2005	2010	Difference	2005	2010	Difference
Physical exercise	44.0	48.8	4.8	49.0	50.8	1.8
Chess or poker	13.0	10.3	-2.7	9.1	6.2	-2.9
Traveling	9.0	11.3	2.3	7.7	9.0	1.3
Social Gathering	33.5	24.6	-8.9	41.3	22.9	-18.4
Audio-visual entertainment	57.0	59.6	2.6	50.0	55.9	5.9
Housework	44.0	35.5	-8.5	84.3	74.7	-9.6
Sleeping	8.0	15.8	7.8	7.0	9.5	2.5
Others	26.5	16.7	-9.8	8.7	14.7	6.0

Significant difference was seen in the frequently watched sports for seniors in 2010 and 2005 ( $P<0.01$ ). The proportion of males watching volleyball, softball and others decreased by 2.1%, 0.5% and 22.3%, respectively, and the proportion of males watching other sports increased. The proportion of females watching softball, wrestling and judo and others decreased by 0.3%, 0.3% and 38.7%, respectively, and the proportion of females watching other sports increased. (table 2-4-2-13).

**Table 2-4-2-13 Comparison of frequently watched sports in seniors (%)**

Sports	M			F		
	2005	2010	Difference	2005	2010	Difference
Basketball	22.5	36.3	13.8**	11.9	18.5	6.6*
Volleyball	14.0	11.9	-2.1	6.3	20.4	14.1**
Football	41.0	57.1	16.1**	15.4	18.5	3.1
Gymnastics	5.0	11.3	6.3*	9.1	38.9	29.8**
Swimming	14.0	20.2	6.2*	11.5	39.3	27.8**
Martial arts	9.0	10.1	1.1	4.9	18.0	13.1**
Boxing	3.0	3.0	0.0	0.0	0.0	0.0
Table tennis	9.5	20.2	10.7**	5.2	14.7	9.5*
Billiards	0.5	5.4	4.9	0.3	0.0	-0.3
Golf	0.5	0.6	0.1	0.0	0.0	0.0
Badminton	1.5	5.4	3.9	3.1	7.6	4.5
Baseball	0.5	0.6	0.1	0.0	0.0	0.0
Softball	0.5	0.0	-0.5	0.0	0.0	0.0
Wrestling or judo	2.0	3.6	1.6	0.3	0.0	-0.3
Others	42.5	20.2	-22.3**	64.3	25.6	-38.7**
Weight- lifting	0.0	1.8	1.8	0.0	0.0	0.0
Fencing	0.0	0.0	0.0	0.0	0.5	0.5

The study showed that there was significant difference between 2010 and 2005 results on the purposes of doing physical exercise in seniors ( $P < 0.01$ ), as indicated by an increase of 8 % (males) and 7.1 % (females) in the purpose of losing weight and keeping fit, an increase of 12.2% (males) and 3.2% (females) in relieving pressure and regulating mood. The proportion of those who exercised for preventing and curing diseases and improving exercise ability decreased. Those who exercised for the purpose of socializing decreased by 5.6% in males, while an increase of 8.0% was shown in females (table 2-4-2-14).

**Table 2-4-2-14 Comparison of exercise purposes in seniors (%)**

Exercise purposes	M			F		
	2005	2010	Difference	2005	2010	Difference
Prevent and cure diseases	83.4	72.4	-11.0**	91.3	80.4	-10.9**
Improve exercise ability	52.2	47.1	-5.1	46.7	36.4	-10.3**
Lose weight and keep fit	6.4	14.4	8.0*	7.9	15.0	7.1*
Relieve pressure and regulate mood	21.7	33.9	12.2**	21.0	24.2	3.2
Socializing	15.9	10.3	-5.6	16.2	24.2	8.0*
Others	10.2	11.5	1.3	6.6	8.6	2.0

Results in both studies showed that the top five sports that male and female seniors participated in descending order were: walking, martial arts and qigong, aerobics and yangko, swimming and jogging. Significant difference was found in the type of exercise for males and females in 2010 and 2005 ( $p < 0.01$ ). The top 3 sports for males in 2005 in descending order were walking, martial arts or qigong and

swimming; for females, they were walking, aerobics or yangko, martial arts or qigong. In 2010, the top 3 sports were walking, jogging and swimming for males, and they were walking, martial arts or qigong, aerobics or yangko for females. There was a decrease in the proportion of males choosing aerobics or yangko, martial arts, qigong and others, and an increase of those choosing other sports. For females, a decrease was seen in the proportion of those choosing walking, work out and strength training and aerobics or yangko, and an increase of those choosing other sports (table 2-4-2-15).

**Table 2-4-2-15 Comparison of sports participated by seniors (%)**

Exercise events	M			F		
	2005	2010	Difference	2005	2010	Difference
Jogging	12.7	18.9	6.2*	5.2	6.2	1.0
Swimming	14.1	17.2	3.1	10.4	17.8	7.4*
Walking	68.8	73.0	4.2	64.6	50.6	-14**
Ball games	7.0	9.8	2.8	4.4	5.9	1.5
Hiking	7.6	12.6	5	2.2	4.6	2.4
Biking	4.5	4.6	0.1	0.9	1.9	1.0
Work out and strength training	1.9	14.4	12.5**	8.3	7.1	-1.2
Aerobics and yangko	10.8	9.7	-1.1	35.8	35.3	-0.5
Martial arts and qigong	17.2	13.8	-3.4	31.4	42.3	10.9**
Others	8.9	8.0	-0.9	6.6	11.0	4.4

Results in both studies showed that a significant difference between 2010 and 2005 was found in the frequency of physical exercise per week ( $P<0.01$ ). In 2010, a decrease was seen in the proportion of seniors who never exercised and in those who exercised for 5 times or more per week. Nonetheless, the proportion of seniors who exercised for less than 1 time, 1-2 times and 3-4 times a week increased (table 2-4-2-16).

**Table 2-4-2-16 Comparison of exercise frequency per week in seniors (%)**

Frequency of exercise per week	M			F		
	2005	2010	Difference	2005	2010	Difference
Never	21.5	14.3	-7.2 **	19.9	15.7	-4.2
Less than 1 time	2.0	9.9	7.9 **	2.8	5.7	2.9
1 – 2 times	11.0	22.7	11.7**	5.6	10.3	4.7 *
3 – 4 times	12.0	20.7	8.7 **	8.7	18.0	9.3**
5 times or more	53.5	32.5	-21.0 **	62.9	50.3	-12.6 **

The results in both studies indicated that there was a significant difference in the duration of physical exercise between 2010 and 2005 ( $P<0.01$ ). In 2010, the proportion of seniors who exercised for less than 30 minutes each time increased by 5.9 % (males) and 2.0 % (females), those who exercised for 30~60 minutes decreased by 0.7 % in males and 12.7 % in females, and those who exercised for 60 minutes or more each time increased by 5.3 % in males and 10.7 % in females (table 2-4-2-17).

**Table 2-4-2-17 Comparison of exercise duration in seniors (%)**

Duration of exercise	M			F		
	2005	2010	Difference	2005	2010	Difference
Less than 30 minutes	21.7	27.6	5.9*	18.8	20.8	2.0
30–60 minutes	47.8	47.1	-0.7	47.6	34.9	-12.7**
60 minutes or more	30.6	25.3	-5.3*	33.6	44.3	10.7**

Results in both 2010 and 2005 studies indicated that there was a significant difference in the persistence duration in seniors to continue exercising ( $P<0.01$ ). The proportion of seniors persisted to continual exercising for less than 6 months increased the most, and the proportion of those who persisted to continual exercising for 3-5 years or over 5 years decreased (table 2-4-2-18).

**Table 2-4-2-18 Comparison of persistent exercising in seniors (%)**

Duration of persistent exercising	M			F		
	2005	2010	Difference	2005	2010	Difference
Less than 6 months	7.0	17.2	10.2**	3.5	9.5	6.0*
6–12 months	5.7	5.7	0.0	6.6	6.7	0.1
1–3 years	21.7	20.1	-1.6	19.2	19.3	0.1
3-5 years	14.0	7.5	-6.5*	16.2	11.0	-5.2*
5 years or more	51.6	49.4	-2.2	54.6	53.4	-1.2

Results in 2010 and 2005 studies showed that seniors choosing park, office or residential area as exercise locations decreased, and those choosing gym and stadium and open area increased in 2010 (table 2-4-2-19).

**Table 2-4-2-19 Comparison of exercise locations in seniors (%)**

Location of doing physical exercise	M			F		
	2005	2010	Difference	2005	2010	Difference
Gym and stadium	17.2	24.7	7.5	17.5	33.0	15.5
Park	70.1	69.5	-0.6	72.5	67.9	-4.6
Office or residential area	12.7	9.8	-2.9	16.2	15.0	-1.2
Open ground area	17.2	29.3	12.1	10.5	16.5	6.0
Road or street	19.1	28.2	9.1	10.0	8.0	-2.0
Recreation club	1.9	5.2	3.3	7.9	5.8	-2.1

Results in both studies showed that the main obstacles that affected seniors to participate in physical exercise were laziness and lack of time. Significant difference was found in seniors in terms of the main obstacles for participating in physical exercise ( $P<0.01$ ). In the 2010 study, the proportion of seniors who considered laziness as the main obstacle for them to participate in physical exercise increased by 17.6% for males and 13.7% for females. There was an increase in the proportion of seniors who considered lack of interest, location, facilities and guidance, and organization as main obstacles (table 2-4-2-20).

**Table 2-4-2-20 Comparison of obstacles to participating in physical exercise in seniors (%)**

Obstacles to participating in physical exercise	M			F		
	2005	2010	Difference	2005	2010	Difference
No interest	10.0	15.9	5.9*	6.3	10.6	4.3
Laziness	19.5	37.1	17.6**	17.1	30.8	13.7**
Not necessary to exercise	1.5	3.5	2.0	1.7	1.0	-0.7
Too weak	6.5	9.4	2.9	9.8	16.4	6.6*
Too labor intensive	6.0	4.1	-1.9	3.1	3.1	-0.0
Lack of time	27.5	27.6	0.1	28.0	38.7	10.7**
Lack of locations and facilities	5.5	9.4	3.9	2.8	5.1	2.3
Lack of guidance	3.0	7.1	4.1	2.4	6.8	4.4
Lack of organization	4.0	6.5	2.5	3.1	5.8	2.7
Lack of money	1.0	3.5	2.5	0.0	0.0	0.0
Others	44.5	21.2	-23.3**	49.0	21.9	-27.1**
Embarrassment	0.0	0.0	0.0	0.0	0.3	0.3

**4.2.2.3. Occurrence of diseases**

The results in both studies indicated that compared with 2005, the proportion of seniors diagnosed with cancer, hypertension, digestive diseases and diabetes increased in 2010 (table 2-4-2-21).

**Table 2-4-2-21 Comparison of diseases in seniors (%)**

Types of diseases	M			F		
	2005	2010	Difference	2005	2010	Difference
Cancer	3.6	4.4	0.8	3.4	6.2	2.8
Cardiovascular	13.9	17.6	3.7	16.2	13.2	-3.0
Respiratory	8.0	7.4	-0.6	4.5	6.6	2.1
Accidental injury	5.1	3.7	-1.4	2.8	3.5	0.7
Digestive	8.0	11.8	3.8	13.4	13.6	0.2
Hypertension	54.0	52.9	-1.1	52.0	62.3	10.3
Endocrine	5.1	0.0	-5.1	4.5	1.6	-2.9
Urinary or reproductive	8.0	11.0	3.0	3.9	1.6	-2.3
Diabetes	13.1	21.3	8.2	15.1	19.1	4.0
Others	27.0	19.9	-7.1	38.0	29.2	-8.8

**4.2.2.4. Understanding of the physical fitness study**

From the data in 2010 and 2005, most seniors considered the physical fitness study as a route to understand their fitness status. In the 2010 study, an increase was seen in the proportion of seniors who considered the physical fitness study helpful to recognize the importance of physical exercise and to improve scientific knowledge of exercising (table 2-4-2-22).

**Table 2-4-2-22 Comparison of understanding of the physical fitness study in seniors (%)**

Understanding of the physical fitness study	M			F		
	2005	2010	Difference	2005	2010	Difference
Meaningless	2.0	4.5	2.5	7.0	2.6	-4.4
To understand the physical fitness status of oneself	96.0	92.6	-3.4	94.1	95.1	1.0
To recognize the importance of physical exercise	45.5	55.7	10.2**	37.4	51.3	13.9**
To improve scientific knowledge of doing exercise	26.0	41.8	15.8**	16.4	43.3	26.9**

### 4.2.3. Comparison of Anthropometric Measurements

#### 4.2.3.1. Length indexes

Comparison of results in the two studies showed that no significant difference was seen in the average height of seniors in 2010 and 2005, and the differences in height were 1.5 cm and 1.6 cm in the 60-64 and 65-69 year age groups, respectively, with no significant difference in males. For females, the differences were 1.1 cm and 2.6 cm in the 60-64 and 65-69 year age groups, respectively, with no significant difference (table 2-4-2-23).

**Table 2-4-2-23 Comparison of average height in seniors (cm)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
60~64 years	164.5	166.0	1.5	152.7	153.8	1.1
65~69 years	163.1	164.7	1.6	150.7	153.3	2.6

In terms of sitting height, comparison of results in the two studies showed that there were no significant difference in the average height of seniors, and the differences were 0.3 cm and 1.0 cm in the 60-64 and 65-69 year age groups for males, with no significant difference, and the differences were 0.3 cm and 1.2 cm in the 60-64 and 65-69 year age groups for females, with no significant difference (table 2-4-2-24).

**Table 2-4-2-24 Comparison of average sitting height in seniors (cm)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
60~64 years	88.7	89.0	0.3	82.7	83.0	0.3
65~69 years	87.4	88.4	1.0	81.3	82.5	1.2

In both 2010 and 2005 studies, no significant difference was found in the average foot length of seniors. There were differences of 0.5 cm and 0.6 cm in the 60-64 and 65-69 year age groups for males, with no significant difference; differences were -0.2 cm and 0.1 cm in the 60-64 and 65-69 year age groups for females, with no significant difference (table 2-4-2-25).

**Table 2-4-2-25 Comparison of average foot length in seniors (cm)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
60~64 years	24.3	24.8	0.5	22.5	22.3	-0.2
65~69 years	24.1	24.7	0.6	22.3	22.4	0.1

**4.2.3.2. Weight and BMI**

Comparison of results in the two studies showed that no significant difference was seen as a whole in the average weight of seniors in 2010 and 2005. However, the study results in 2010 indicated that there was significant difference between the average weight of males in the 60-64 and 65-69 year age groups in 2010 and 2005 ( $P < 0.05$ ), which showed that the weight of male seniors increased by 2.1 kg and 3.9 kg in the two age groups compared with that in 2005. For females, there was no significant difference in weight, with a difference of -1.3 kg and 1.5 kg in the 60~64 and 65~69 year age group, respectively (table 2-4-2-26).

**Table 2-4-2-26 Comparison of average weight in seniors (kg)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
60~64 years	63.0	65.1	2.1*	56.5	55.2	-1.3
65~69 years	62.2	66.1	3.9*	55.4	56.9	1.5

No significant difference was seen in the overall average BMI of seniors in the 2010 and 2005 studies. However, study results showed that there was significant difference between 2010 and 2005 results in the average BMI of males in the 60-64 and 65-69 age year groups ( $P < 0.05$ ), which increased by 0.3 and 0.9, respectively compared with that in 2005, while the average BMI of females decreased by 0.8 and 0.2 in the 60-64 and 65-69 year age groups, respectively (table 2-4-2-27).

**Table 2-4-2-27 Comparison of average BMI in seniors**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
60~64 years	23.3	23.6	0.3	24.2	23.4	-0.8
65~69 years	23.4	24.3	0.9*	24.4	24.2	-0.2

There was no significant difference on the overall obesity rate of seniors in the study of 2010 and 2005. In 2010, the obesity rate of males increased as age increased, the proportion of obesity in males decreased by 1.2 % in the 60~64 year age groups, and increased by 2.5 % in the 65~69 age year groups compared with that in 2005, while for females, the proportion of obesity decreased by 3.6 % and 1.7 % in the two age groups compared with that in 2005 (table 2-4-2-28).

**Table 2-4-2-28 Comparison of obesity rate in seniors (%)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
60~64 years	4.0	2.8	-1.2	14.3	10.7	-3.6
65~69 years	7.1	9.6	2.5	15.2	13.5	-1.7

4.2.3.3. Circumference indexes

Results in the two studies showed that there was significant difference in the average chest circumference of seniors in 2010 and 2005 ( $P<0.01$ ), and the significant difference was seen in 2010 in the average chest circumference of males compared with that in 2005 ( $P<0.05$ ) with an increase of 0.2 cm in the 60~64 year age groups and 2.7 cm in 65~69 year age groups, meanwhile, the difference was extremely obvious in the average chest circumference of female seniors compared with that in 2005 ( $P<0.01$ ) with a decrease of 4.8 cm in the 60~64 year age groups and 3.6 cm in 65~69 year age groups (table 2-4-2-29).

**Table 2-4-2-29 Comparison of average chest circumference in seniors (cm)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
60~64 years	91.4	91.6	0.2	90.6	85.8	-4.8**
65~69 years	89.6	92.3	2.7*	90.4	86.8	-3.6**

Results in the two studies showed that there was significant difference in the average waist circumference of seniors in 2010 and 2005 ( $P<0.01$ ), and no significant difference was found in the average waist circumference of males, with an increase of 0.9 cm in the 60~64 year age groups and 2.9 cm in 65~69 age groups, meanwhile, the difference was extremely obvious in the average waist circumference of females compared with that in 2005 ( $P<0.01$ ) with a decrease of 3.7 cm in the 60~64 year age groups and 2.1 cm in 65~69 year age groups (table 2-4-2-30).

**Table 2-4-2-30 Comparison of average waist circumference in seniors (cm)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
60~64 years	85.5	86.4	0.9	85.0	81.3	-3.7**
65~69 years	86.4	89.3	2.9*	86.4	84.3	-2.1

Results in the two studies showed that there was no significant difference in the average hip circumference of seniors in 2010 and 2005 ( $P<0.01$ ), and no significant difference was seen in the average hip circumference of males, with an increase of 2.4 cm in the 60~64 year age groups and 4.4 cm in 65~69 year age groups; there was also no significant difference in the average hip circumference of females compared with that in 2005, with a decrease of 1.4 cm in the 60~64 year age groups and an increase of 0.1 cm in 65~69 year age groups (table 2-4-2-31).

**Table 2-4-2-31 Comparison of average hip circumference in seniors (cm)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
60~64 years	90.6	93.0	2.4	92.3	90.9	-1.4
65~69 years	90.2	94.6	4.4	91.7	91.8	0.1

Results in the two studies showed that significant difference was seen in the WHR of seniors in 2010 and 2005 ( $P<0.01$ ), and there was significant difference in the average WHR of males compared with that in 2005 ( $P<0.05$ ), with an increase of 0.014 in the 60~64 year age groups and 0.013 in 65~69 year age groups; meanwhile, the difference was extremely obvious in the WHR of females compared with that in



2005 ( $P < 0.01$ ), with a decrease of 0.027 in the 60~64 year age groups and 0.024 in 65~69 year age groups (table 2-4-2-32).

**Table 2-4-2-32 Comparison of average WHR in seniors**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
60~64 years	0.943	0.929	-0.014*	0.920	0.893	-0.027**
65~69 years	0.956	0.943	-0.013	0.942	0.918	-0.024**

**4.2.3.4. Width indexes**

Results in the two studies indicated that significant difference was seen in the average shoulder width of seniors in 2010 and 2005 ( $P < 0.05$ ), and there was significant difference in the average shoulder width of males compared with that in 2005 ( $P < 0.05$ ), with a decrease of 0.7 cm in the 60~64 year age groups and 0.5 cm in 65~69 year age groups; meanwhile, the difference was extremely obvious in the average shoulder width of females compared with that in 2005 ( $P < 0.01$ ), with an increase of 0.5 cm in the 60~64 year age groups and 1.1 cm in 65~69 year age groups (table 2-4-2-33).

**Table 2-4-2-33 Comparison of average shoulder width in seniors (cm)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
60~64 years	37.4	36.7	-0.7*	34.0	34.5	0.5
65~69 years	37.3	36.8	-0.5	33.6	34.7	1.1**

Results in the two studies indicated that no significant difference was seen in the average pelvis width of seniors in 2010 and 2005, and there was significant difference in the average pelvis width of males compared with that in 2005 ( $P < 0.05$ ), with a decrease of 0.7 cm in the 60~64 year age groups and 0.3 cm in 65~69 year age groups; significant difference was also found in the average pelvis width of females compared with that in 2005 ( $P < 0.05$ ), with an increase of 0.3 cm in the 60~64 year age groups and 0.9 cm in 65~69 year age groups (table 2-4-2-34).

**Table 2-4-2-34 Comparison of average pelvis width in seniors (cm)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
60~64 years	27.9	27.2	-0.7*	28.2	28.5	0.3
65~69 years	27.9	27.6	-0.3	28.0	28.9	0.9*

**4.2.3.5. Body composition**

Results in the two studies indicated that no significant difference was seen in the average upper arm skinfold thickness of seniors in 2010 and 2005, and there was significant difference in the average upper arm skinfold thickness of males compared with that in 2005 ( $P < 0.05$ ), with a decrease of 2.9 cm in the 60~64 year age groups and 1.6 cm in 65~69 year age groups; meanwhile, there was no significant difference in the average upper arm skinfold thickness of female compared with that in 2005, with a

decrease of 1.2 cm in the 60~64 year age groups and an increase of 1.4 cm in 65~69 year age groups (table 2-4-2-35).

**Table 2-4-2-35 Comparison of average upper arm skinfold thickness in seniors (mm)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
60~64 years	12.3	9.4	-2.9*	22.2	21.0	-1.2
65~69 years	12.7	11.1	-1.6*	20.7	22.1	1.4

Results in the two studies indicated that there was significant difference in the average subscapular skinfold thickness of seniors in 2010 and 2005 ( $P<0.01$ ), and significant difference was seen in the average subscapular skinfold thickness of males compared with that in 2005 ( $P<0.01$ ), with a decrease of 3.5 cm in the 60~64 year age groups and 2.0 cm in 65~69 year age groups; meanwhile, significant difference was also seen in the average subscapular skinfold thickness of female compared with that in 2005 ( $P<0.01$ ), with a decrease of 4.5 cm in the 60~64 year age groups and 1.6 cm in 65~69 year age groups (table 2-4-2-36).

**Table 2-4-2-36 Comparison of average subscapular skinfold thickness in seniors (mm)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
60~64 years	20.6	17.1	-3.5 **	23.7	19.2	-4.5**
65~69 years	20.5	18.5	-2.0	22.3	20.7	-1.6

Results in the two studies indicated that there was significant difference in the average abdominal skinfold thickness of seniors in 2010 and 2005 ( $P<0.01$ ), no significant difference was seen in the average abdominal skinfold thickness of males compared with that in 2005, with a decrease of 1.0 cm in the 60~64 year age groups and 1.7 cm in 65~69 year age groups; meanwhile, significant difference was found in the average abdominal skinfold thickness of females compared with that in 2005 ( $P<0.01$ ), with a decrease of 5.7 cm in the 60~64 year age groups and 3.0 cm in 65~69 year age groups (table 2-4-2-37).

**Table 2-4-2-37 Comparison of average abdominal skinfold thickness in seniors (mm)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
60~64 years	23.2	22.2	-1.0	31.5	25.8	-5.7**
65~69 years	24.1	22.4	-1.7	31.1	28.1	-3.0**

#### 4.2.4. Comparison of Physiological Function

##### 4.2.4.1. Resting pulse

Results in the two studies indicated that there was significant difference in the average resting pulse in 2010 and 2005 ( $P<0.01$ ). Compared with that in 2005, no significant difference was seen in the average resting pulse of males, with a decrease of 1.3 times/minute in the 60~64 year age groups and 2.0 times/minute in 65~69 year age groups; meanwhile, significant difference was found in the average resting pulse of females ( $P<0.01$ ), with a significant decrease of 4.1 times/minute in the 60~64 year age groups

and 2.0 times/minute in 65~69 year age groups (table 2-4-2-38).

**Table 2-4-2-38 Comparison of average resting pulse in seniors (times/min)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
60~64 years	76.0	74.7	-1.3	77.3	73.2	-4.1**
65~69 years	76.4	74.4	-2.0	75.9	73.9	-2.0

**4.2.4.2. Blood pressure**

Results in the two studies indicated that no significant difference was seen in the average systolic pressure of seniors in 2010 and 2005, and the systolic pressure of males increased in 2010. However, compared with that in 2005, there was no significant difference in the average systolic pressure of males, with an increase of 0.1 mmHg in the 60~64 year age groups and 1.3 mmHg in 65~69 year age groups; meanwhile, there was also no significant difference in the average systolic pressure of females, with a decrease of 3.0 mmHg in the 60~64 year age groups and an increase of 1.9 mmHg in 65~69 year age groups (table 2-4-2-39).

**Table 2-4-2-39 Comparison of average systolic pressure in seniors (mmHg)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
60~64 years	131.7	131.8	0.1	130.8	127.8	-3.0
65~69 years	132.1	133.4	1.3	130.9	132.8	1.9

Results in the two studies indicated that no significant difference was seen in the average diastolic pressure of seniors in 2010 and 2005. The diastolic pressure of males in 2010 decreased 1.8 mmHg in the 60~64 year age groups and 0.5 mmHg in 65~69 year age groups, and the difference was not significant compared with that in 2005. There was also no significant difference in the average diastolic pressure of females with a decrease of 1.7 mmHg in the 60~64 year age groups and an increase of 3.0 mmHg in 65~69 year age groups (table 2-4-2-40).

**Table 2-4-2-40 Comparison of average diastolic pressure in seniors (mmHg)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
60~64 years	81.9	80.1	-1.8	78.6	76.9	-1.7
65~69 years	78.1	77.6	-0.5	74.9	77.9	3.0

Results in the two studies indicated that no significant difference was seen in the average pressure difference of seniors in 2010 and 2005, and the pressure difference of males increased in 2010. However, compared with that in 2005, there was no significant difference in the average pressure difference of males, with an increase of 1.7 mmHg in the 60~64 year age groups and 1.9 mmHg in 65~69 year age groups; meanwhile, there was also no significant difference in the average pressure difference of females, with a decrease of 1.3 mmHg in the 60~64 year age groups and 65~69 year age groups (table 2-4-2-41).

**Table 2-4-2-41 Comparison of average pressure difference in seniors (mmHg)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
60~64 years	49.9	51.6	1.7	52.2	50.9	-1.3
65~69 years	54.0	55.9	1.9	56.1	54.8	-1.3

**4.2.4.3. Vital capacity**

Results in the two studies indicated that no significant difference was seen in the average vital capacity of seniors in 2010 and 2005, and the vital capacity of males increased in 2010, but no significant difference was seen in the average vital capacity. However, compared with that in 2005, there was no significant difference in the average vital capacity of male with an increase of 107.8 ml in the 60~64 year age groups and 145.7 ml in 65~69 year age groups; meanwhile, there was also no significant difference in the average vital capacity of females, with a decrease of 36.5 ml in the 60~64 year age groups and an increase of 33.8 ml in 65~69 year age groups (table 2-4-2-42).

**Table 2-4-2-42 Comparison of average vital capacity in seniors (ml)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
60~64 years	2890.4	2998.2	107.8	1932.7	1896.2	-36.5
65~69 years	2525.7	2671.4	145.7	1783.6	1817.4	33.8

**4.2.4.4. Vital capacity/weight**

Results in the two studies indicated that no significant difference was seen in the average vital capacity/weight of seniors in 2010 and 2005, and the vital capacity/weight of males decreased in 2010, but no significant was seen in the average vital capacity/weight. However, compared with that in 2005, there was no significant difference in the average vital capacity/weight of males, with a decrease of 2.8 ml/kg in the 60~64 year age groups and 1.3 ml/kg in 65~69 year age groups, while there was also no significant difference in the average vital capacity/weight of females, with an increase of 0.1 ml/kg in the 60~64 year age groups and there was no change in 65~69 year age groups (table 2-4-2-43).

**Table 2-4-2-43 Comparison of average vital capacity/weight in seniors (ml/kg)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
60~64 years	49.3	46.5	-2.8	35.0	35.1	0.1
65~69 years	42.4	41.1	-1.3	32.7	32.7	0.0

**4.2.5. Comparison of Physical Fitness**

**4.2.5.1. Strength**

Results in the two studies indicated that there was significant difference in the average grip strength in 2010 and 2005 ( $P < 0.05$ ), and compared with that in 2005, no significant difference was seen in the

average grip strength of males, with a decrease of 1.0 kg in the 60~64 year age groups and an increase of 1.6 kg in 65~69 year age groups; meanwhile, significant difference was found in the average grip strength in females compared with that in 2005( $P<0.01$ ), with a decrease of 2.0 kg in the 60~64 year age groups and there was no change in 65~69 year age groups (table 2-4-2-44).

**Table 2-4-2-44 Comparison of average grip strength in seniors (kg)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
60~64 years	37.1	36.1	-1.0	22.2	20.2	-2.0**
65~69 years	33.1	34.7	1.6*	20.5	20.5	0.0

**4.2.5.2. Flexibility**

Results in the two studies indicated that no significant difference was seen in the average sit and reach of seniors in 2010 and 2005, and there were no significant difference in the average sit and reach of males compared with that in 2005, with a decrease of 0.3 cm in the 60~64 year age groups and an increase of 1.9 cm in 65~69 year age groups; no significant difference was found in the average sit and reach of females, with a decrease of 1.4 cm in the 60~64 year age groups and an increase of 2.5 cm in 65~69 year age groups (table 2-4-2-45).

**Table 2-4-2-45 Comparison of average sit and reach in seniors (cm)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
60~64 years	-0.6	-0.9	-0.3	7.7	6.3	-1.4
65~69 years	-4.2	-2.3	1.9	5.0	7.5	2.5

**4.2.5.3. Respond**

Results in the two studies indicated that significant difference was seen in the average selective respond time of seniors in 2010 and 2005 ( $P<0.01$ ), and the average selective respond time of males decreased with significant difference compared with that in 2005 ( $P<0.01$ ), and decreased by 0.03 seconds in the 60~64 year age groups and 0.04 seconds in 65~69 year age groups. For females, significant difference was found in the average selective respond time ( $P<0.01$ ), with a decrease of 0.02 seconds in the 60~64 year age groups and 0.05 seconds in 65~69 year age groups (table 2-4-2-46).

**Table 2-4-2-46 Comparison of average selective respond time in seniors (sec)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
60~64 years	0.51	0.48	-0.03**	0.57	0.55	-0.02**
65~69 years	0.55	0.51	-0.04**	0.68	0.63	-0.05**

**4.2.5.4. Balance**

Results in the two studies indicated that significant difference was seen in the average time for the OFSEC of seniors in 2010 and 2005 ( $P<0.01$ ), and the average time for the OFSEC of males increased with significant difference compared with that in 2005 ( $P<0.05$ ), and increased by 3.8 seconds in the 60~64 year age groups and 1.6 seconds in 65~69 year age groups. For females, significant difference was found in the average time for the OFSEC ( $P<0.05$ ), with an increase of 1.8 seconds in the 60~64 year age groups and 1.3 seconds in 65~69 year age groups (table 2-4-2-47).

**Table2-4-2-47 Comparison of average OFSEC time in seniors (sec)**

Age Group	M			F		
	2005	2010	Difference	2005	2010	Difference
60~64 years	10.6	14.4	3.8**	8.4	10.2	1.8*
65~69 years	8.1	9.7	1.6*	6.1	7.4	1.3*

**4.3. Summary**

**4.3.1. Summary of 2010 Results on the Physical Fitness Study of Seniors**

Among seniors in the 60~69 year age groups, higher education level was seen in males than that in females. In daily habits, there was difference among genders in sleeping hours and quality, and males had longer sleeping hours and better sleeping quality. No significant difference among genders was seen in the average daily walking hours in males and females, and as age increased, the proportion of seniors with long walking time (over 2 hours) increased. In terms of smoking and drinking, significant difference among genders was found. The main activity of seniors during their leisure time was physical exercise. The main purpose for seniors to participate in the physical exercise was to prevent and cure diseases, followed by the reason of improving exercise ability. There were various obstacles that affected seniors to participate in physical exercise, and most seniors considered laziness and lack of time as the main obstacles.

Length indexes of males and females decreased slightly as age increased (except foot length of females). Males had higher indexes in height, sitting height and foot length, with significant difference among genders. The circumference indexes of males and females increased slightly as age increased. Males had a greater average shoulder width than females, and the pelvis width was similar in males and females with no significant difference. The weight of males and females increased slightly as age increased, BMI was relatively stable, and the average ranged slightly with age. Females had a greater obesity rate than males.

Physiological functions decreased considerably with age. Resting pulse and blood pressure remained relatively stable as age increased. However, vital capacity of seniors decreased noticeably with age, and the vital capacity of males decreased more than that of females.

Physical fitness of seniors decreased significantly with age, which was indicated by the decrease in

muscle strength (grip strength), flexibility (sit and reach), respond (selective respond time) and balance ability (OFSEC). The grip strength of females in both age groups remained unchanged. Comparison between males and females showed that, apart from the flexibility index, males achieved better results than females in all other indexes.

#### **4.3.2. Comparison of 2010 and 2005 Results on the Physical Fitness Study of Seniors**

486 and 591 samples, respectively, were drawn for the 2005 and 2010 physical fitness study of Macao seniors. The sample units and tests performed kept consistence in the two studies.

In terms of lifestyle, compared with that in 2005, seniors had less sleeping hours in 2010. The proportion of males who never drank alcohol and smoked increased. The cumulative daily walking hours decreased. More seniors participated in physical exercise, but the proportion of seniors who participated in physical exercise for over 5 times a week decreased, as well as the proportion of those with exercise duration more than 30 minutes also decreased.

For basic anthropometric information, compared with that in 2005, no significant difference was seen in the height and weight of seniors. There were an increase of chest circumference in males and decrease of chest circumference in females.

In physiological function, compared with that in 2005, resting pulse increased and no significant difference was found in blood pressure of females. Vital capacity increased in males and no significant difference was seen in females.

In terms of physical fitness, compared with that in 2005, there was a decrease in the strength (grip strength) of females. An increase in respond ability (selective respond time) in males and females was seen. Balance ability (OFSEC) of males and females improved and no significant difference was seen in flexibility (sit and reach).

# PART III

## Statistic Data

human genome project

```
0101 011 0101 0101 1100 01 01010 11 01 100 101 0110 01 01 1011 01 0101
1 10 1 11 01 1 11 111 01010101 01 0101 10
10 0 101 010 1 10 1 10 101010101 1010 1110110101
11 0 10 10 10101 1010 10101
1 01101010 1010
10 01 01010
1 0 10 01
1010 1011 0
101010 101 0
11 0101 10
110 1 010
100 110111011 1010
1010 105 010 00100 0 010 101 101
100 1 10 100011 101 0 101
011010 010101 010 010
010 1 01 10 1 1 01 0
11 01 1 010 1 1 1 0 01010 1 01 110011 101001010110101
110 10 10100 11010 1 010 0 1101 101 210
1 111010010010101 0100101 1010 0101010 1010
```



## Part III Statistic Data

### 1. Young Children

#### 1.1. Basic Information of the Subjects

**Table 3-1-1-1 Distribution of sampling sites (kindergartens)**

Areas	Sampling site (kindergartens)	M		F		Total	
		Subjects (n)	Percentage (%)	Subjects (n)	Percentage (%)	Subjects (n)	Percentage (%)
North	Keang Peng School (Kindergarten)	122	18.3	91	22.8	213	20
	Hou Kong Middle School (affiliated kindergarten)	96	14.4	59	14.8	155	14.6
Central	Pui Ching Middle School(kindergarten)	146	22.0	103	25.8	249	23.4
	Chan Sui Ki Perpetual Help College (branch school)	148	22.3	51	12.8	199	18.7
South	Pooi To Middle School (branch school of Praia Grande- kindergarten)	101	15.2	64	16.0	165	15.5
	Estrela do Mar School (kindergarten)	52	7.8	32	8.0	84	7.9
<b>Total</b>		<b>665</b>	<b>100</b>	<b>400</b>	<b>100</b>	<b>1065</b>	<b>100</b>

**Table 3-1-1-2 Residential distribution of subjects (%)**

Gender	Communities	Keang Peng School (Kindergarten)	Hou Kong Middle School (affiliated kindergarten)	Pui Ching Middle School (kindergarten)	Chan Sui Ki Perpetual Help College (branch school)	Pooi To Middle School(branch school of Praia Grande - kindergarten)	Estrela do Mar School (kindergarten)
M	Na. Sra. do Carmo	0.8	1.0	26.7	12.2	33.7	5.8
	S. Lourenço	0.0	1.0	3.4	2.7	7.9	75.0
	Sé Catedral	0.8	4.2	4.1	9.5	24.8	7.7
	S. António	8.2	69.8	34.9	33.1	16.8	5.8
	S. Lázaro	3.3	5.2	15.1	6.8	6.9	1.9
	Na. Sra. de Fátima	86.9	18.8	14.4	35.1	9.9	3.8
	Coloane	0.0	0.0	1.4	0.7	0.0	0.0
F	Na. Sra. do Carmo	3.3	1.7	22.3	21.6	25.0	0.0
	S. Lourenço	0.0	1.7	2.9	5.9	18.8	65.6
	Sé Catedral	0.0	3.4	9.7	7.8	23.4	9.4
	S. António	2.2	61.0	30.1	31.4	17.2	9.4
	S. Lázaro	4.4	3.4	18.4	11.8	3.1	6.3
	Na. Sra. de Fátima	90.1	28.8	15.5	21.6	12.5	9.4
	Coloane	0.0	0.0	1.0	0.0	0.0	0.0

**Table 3-1-1-3 Birth place (%)**

Gender	Birthplace	Aged 3	Aged 4	Aged 5	Aged 6	Total
M	Mainland	1.6	2.7	3.2	6.1	<b>3.0</b>
	Macao	94.3	93.5	89.9	90.8	<b>92.3</b>
	Hong Kong	1.6	3.2	3.7	2.0	<b>2.7</b>
	Others	2.6	0.5	3.2	1.0	<b>2.0</b>
F	Mainland	2.9	0.9	7.5	10.8	<b>5.0</b>
	Macao	90.2	92.3	86.9	85.1	<b>89.0</b>
	Hong Kong	2.9	3.4	2.8	2.7	<b>3.0</b>
	Others	3.9	3.4	2.8	1.4	<b>3.0</b>

**Table 3-1-1-4 Kindergarten attendance (%)**

Gender	Kindergarten attendance	Aged 3	Aged 4	Aged 5	Aged 6	Total
M	No	0.0	0.5	0.0	0.0	<b>0.2</b>
	Half day	13.0	1.1	0.5	0.0	<b>4.2</b>
	Full day	87.0	98.4	99.5	100	<b>95.6</b>
F	No	1.0	0.0	0.0	0.0	<b>0.3</b>
	Half day	12.7	3.4	0.0	0.0	<b>4.2</b>
	Full day	86.3	96.6	100.0	100	<b>95.5</b>

**Table 3-1-1-5 Young children guidance (%)**

Gender	Guidance	Aged 3	Aged 4	Aged 5	Aged 6	Total
M	Parents	47.2	57.3	56.1	60.6	<b>54.5</b>
	SeniorS	26.4	25.9	23.8	30.9	<b>26.2</b>
	Babysitter (Workers)	25.4	16.8	19.0	8.5	<b>18.8</b>
	Others	1.0	0.0	1.1	0.0	<b>0.6</b>
F	Parents	50.0	51.3	58.5	58.3	<b>54.2</b>
	SeniorS	32.4	23.1	27.4	27.8	<b>27.5</b>
	Babysitter (Workers)	16.7	23.9	14.2	13.9	<b>17.6</b>
	Others	1.0	1.7	0.0	0.0	<b>0.8</b>

## 1.2. Lifestyle

**Table 3-1-2-1 Gestational age (%)**

Gender	Age group(year)	Subjects (n)	Premature	Full term	Post term
M	3	191	17.8	80.6	1.6
	4	185	12.4	84.3	3.2
	5	189	14.8	82.0	3.2
	6	94	18.1	79.8	2.1
F	3	102	11.8	86.3	2.0
	4	117	8.5	89.7	1.7
	5	107	10.3	85.0	4.7
	6	72	8.3	87.5	4.2
<b>Total</b>		<b>1057</b>	<b>13.3</b>	<b>83.9</b>	<b>2.7</b>

Table 3-1-2-2 Birth weight (kg)

Gender	Age group (year)	Subjects (n)	Average	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	3	164	3.2	0.5	2.4	2.7	2.9	3.2	3.5	3.8	4.0
	4	151	3.3	0.4	2.5	2.7	3.0	3.3	3.4	3.8	4.1
	5	114	3.2	0.5	2.1	2.6	3.0	3.2	3.5	3.8	4.0
	6	66	3.2	0.7	1.9	2.5	2.8	3.2	3.6	3.8	4.8
F	3	67	3.1	0.4	2.1	2.5	2.8	3.1	3.4	3.6	3.9
	4	87	3.2	0.5	2.3	2.7	2.9	3.2	3.5	3.8	4.1
	5	89	3.1	0.4	2.3	2.6	2.8	3.2	3.4	3.6	4.1
	6	60	3.2	0.7	2.2	2.5	2.8	3.2	3.5	3.7	5.0

Table 3-1-2-3 Birth length (cm)

Gender	Age group (year)	Subjects (n)	Average	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	3	155	48.7	3.3	38.4	46.0	47.0	49.0	50.5	52.0	54.3
	4	144	49.2	2.6	45.2	47.0	48.0	49.5	50.0	51.5	53.3
	5	142	48.6	3.7	37.0	46.0	48.0	49.0	50.1	51.0	53.0
	6	52	49.1	2.6	44.5	45.3	48.0	49.0	51.0	51.5	55.5
F	3	80	48.2	2.6	42.6	46.0	47.0	48.3	50.0	51.0	51.5
	4	87	48.7	3.3	39.1	46.4	48.0	49.0	50.0	52.0	53.7
	5	75	48.0	2.8	40.7	45.3	47.0	48.0	50.0	50.5	51.0
	6	41	48.9	3.3	36.0	45.0	48.0	49.5	50.0	51.9	54.4

Table 3-1-2-4 Feeding pattern within 4 months after birth (%)

Gender	Age group (year)	Subjects (n)	Breast feeding	Formula feeding	Mixed feeding
M	3	193	7.8	58.0	34.2
	4	185	15.7	51.9	32.4
	5	188	11.2	61.2	27.7
	6	94	16.0	58.5	25.5
F	3	102	15.7	54.9	29.4
	4	117	19.7	47.0	33.3
	5	107	12.1	55.1	32.7
	6	72	19.4	51.4	29.2
<b>Total</b>		<b>1058</b>	<b>13.8</b>	<b>55.3</b>	<b>30.9</b>

Table 3-1-2-5 Average sleeping hours per day (%)

Gender	Age group (year)	Subjects (n)	Less than 8 hrs	8~10 hrs	At least 10 hrs
M	3	192	1.6	63.0	35.4
	4	185	1.6	69.2	29.2
	5	189	2.1	74.6	23.3
	6	98	6.1	84.7	9.2
F	3	102	2.0	57.8	40.2
	4	117	2.6	72.6	24.8
	5	107	0.9	80.4	18.7
	6	74	2.7	95.9	1.4
<b>Total</b>		<b>1064</b>	<b>2.3</b>	<b>72.7</b>	<b>25.0</b>

Table 3-1-2-6 Average hours of daily outdoor activities (%)

Gender	Age group (year)	Subjects (n)	Less than 30 mins	30 mins~1 hr	1~2 hrs	At least 2 hrs
M	3	192	21.4	45.3	24.0	9.4
	4	185	30.8	43.8	17.8	7.6
	5	188	31.4	42.0	19.1	7.4
	6	96	43.8	33.3	17.7	5.2
F	3	102	29.4	40.2	26.5	3.9
	4	117	29.1	47.0	16.2	7.7
	5	107	29.9	41.1	23.4	5.6
	6	74	44.6	41.9	12.2	1.4
<b>Total</b>		<b>1061</b>	<b>30.9</b>	<b>42.4</b>	<b>20.0</b>	<b>6.7</b>

Table 3-1-2-7 Average hours of watching TV, video and playing video games per day (%)

Gender	Age group (year)	Subjects (n)	Less than 30 mins	30 mins~1h	1~2 hrs	2~ 3hrs	At least 3 hrs
M	3	193	24.4	34.7	26.9	11.9	2.1
	4	185	15.7	29.7	34.1	16.8	3.8
	5	189	9.0	30.7	39.7	18.0	2.6
	6	98	17.3	39.8	27.6	14.3	1.0
F	3	102	22.5	28.4	29.4	15.7	3.9
	4	117	17.9	32.5	27.4	19.7	2.6
	5	106	12.3	27.4	39.6	12.3	8.5
	6	74	10.8	36.5	36.5	14.9	1.4
<b>Total</b>		<b>1064</b>	<b>16.4</b>	<b>32.1</b>	<b>32.7</b>	<b>15.5</b>	<b>3.2</b>

Table 3-1-2-8 Participation of extracurricular hobby classes (%)

Gender	Age group (year)	Subjects who participated in hobby classes	Physical exercise	Tutoring	Music & dance	Drawing & calligraphy	others	Chess
M	3	66	25.8	28.8	48.5	30.3	24.2	0.0
	4	94	16.0	33.0	38.3	48.9	17.0	1.1
	5	131	24.4	38.9	45.0	44.3	19.8	5.3
	6	62	30.6	32.3	32.3	38.7	25.8	8.1
F	3	39	15.4	23.1	66.7	25.6	5.1	0.0
	4	62	19.4	17.7	75.8	32.3	16.1	0.0
	5	85	10.6	27.1	81.2	40.0	17.6	1.2
	6	55	18.2	30.9	65.5	32.7	7.3	1.8
<b>Total</b>		<b>594</b>	<b>20.2</b>	<b>30.5</b>	<b>54.7</b>	<b>38.7</b>	<b>17.7</b>	<b>2.5</b>

**Table 3-1-2-9 Sports activities (%)**

Gender	Age group (year)	Subjects (n)	Swimming	Track & field	Balls	Gymnastics	Skating	Dancing	Skipping	Martial arts, Taekwondo	Cycling	Others	Yoga	Karate	Judo
M	3	143	19.6	18.2	33.6	16.1	0.7	6.3	2.1	2.1	50.3	21.7	0.0	0.0	0.0
	4	153	23.5	14.4	30.1	15.0	1.3	7.2	1.3	1.3	52.3	22.9	0.7	0.0	0.0
	5	164	32.9	14.0	28.0	15.2	2.4	6.7	2.4	6.1	47.0	18.9	0.0	1.2	0.0
	6	64	29.7	9.4	35.9	17.2	9.4	4.7	23.4	7.8	32.8	20.3	0.0	1.6	3.1
F	3	86	17.4	8.1	14.0	23.3	1.2	22.1	1.2	1.2	33.7	31.4	1.2	0.0	0.0
	4	103	21.4	7.8	5.8	19.4	0.0	36.9	6.8	1.0	34.0	20.4	1.9	0.0	0.0
	5	97	18.6	11.3	10.3	22.7	3.1	52.6	4.1	3.1	36.1	9.3	1.0	0.0	0.0
	6	58	20.7	3.4	29.3	12.1	0.0	46.6	29.3	1.7	15.5	13.8	0.0	0.0	0.0
<b>Total</b>		<b>868</b>	<b>23.5</b>	<b>12.1</b>	<b>24.0</b>	<b>17.4</b>	<b>2.0</b>	<b>19.5</b>	<b>6.1</b>	<b>3.0</b>	<b>41.2</b>	<b>20.2</b>	<b>0.6</b>	<b>0.3</b>	<b>0.2</b>

**Table 3-1-2-10 Frequency of having flu or fever within the past year (%)**

Gender	Age group (year)	Subjects (n)	Never	1~2 times	3~5 times	At least 6 times
M	3	193	0.5	26.4	47.7	25.4
	4	184	1.6	31.0	52.7	14.7
	5	189	3.7	34.9	48.7	12.7
	6	94	5.3	42.6	29.8	22.3
F	3	101	2.0	22.8	56.4	18.8
	4	116	0.9	38.8	46.6	13.8
	5	106	7.5	39.6	42.5	10.4
	6	72	6.9	44.4	30.6	18.1
<b>Total</b>		<b>1055</b>	<b>3.0</b>	<b>33.7</b>	<b>46.2</b>	<b>17.1</b>

**Table 3-1-2-11 Occurrence of diseases (%)**

Gender	Age group (year)	Subjects (n)	Yes	No
M	3	193	20.7	79.3
	4	185	22.2	77.8
	5	189	25.4	74.6
	6	98	17.3	82.7
F	3	102	15.7	84.3
	4	117	23.9	76.1
	5	107	14.0	86.0
	6	74	12.2	87.8
<b>Total</b>		<b>1065</b>	<b>20.1</b>	<b>79.9</b>

**Table 3-1-2-12 Diseases commonly seen (%)**

Gender	Age group (year)	Disease-stricken young children (n)	Chronic bronchitis	Pneumonia	Asthma	Others
M	3	40	30.0	30.0	7.5	40.0
	4	41	22.5	30.0	5.0	45.0
	5	48	39.6	29.2	14.6	39.6
	6	17	35.3	41.2	11.8	29.4
F	3	16	37.5	18.8	6.3	37.5
	4	28	44.4	40.7	11.1	18.5
	5	15	33.3	26.7	13.3	26.7
	6	9	44.4	44.4	11.1	22.2
<b>Total</b>		<b>214</b>	<b>34.4</b>	<b>31.6</b>	<b>9.9</b>	<b>35.4</b>

**1.3. Anthropometric Measurements**

**Table 3-1-3-1 Height (cm)**

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	3	192	99.8	4.58	92.5	94.6	96.7	99.9	102.5	104.6	109.1
	4	185	106.2	4.08	98.7	100.5	103.3	106.6	108.9	111.2	113.7
	5	189	111.9	4.81	103.7	106.2	108.6	111.9	115.2	117.9	121.2
	6	98	119.2	5.72	108.7	112.0	114.8	118.5	123.2	126.4	132.0
F	3	102	98.2	4.51	90.3	93.6	95.8	97.5	100.7	103.6	105.6
	4	117	105.1	4.73	96.1	98.5	102.3	104.7	108.5	111.8	114.4
	5	107	110.9	5.07	100.5	104.1	107.2	111.3	114.5	116.8	120.7
	6	74	118.0	5.17	108.3	111.1	114.6	118.7	121.9	124.0	128.2

**Table 3-1-3-2 Sitting height (cm)**

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	3	192	57.4	2.65	53.0	54.5	55.6	57.2	58.9	60.4	63.0
	4	184	60.4	3.22	55.4	57.5	58.5	60.3	61.7	63.3	65.0
	5	188	62.3	2.52	57.9	58.9	61.0	62.2	63.9	65.5	67.2
	6	98	65.5	3.10	59.5	61.9	63.4	65.5	67.6	69.6	71.6
F	3	102	56.3	2.20	52.3	53.8	55.0	55.9	57.6	59.2	60.1
	4	117	59.4	2.86	54.3	55.8	57.5	59.2	61.4	62.8	64.9
	5	105	62.0	3.74	56.1	57.6	60.3	61.9	63.8	65.3	67.4
	6	74	64.5	2.88	59.6	60.8	62.2	64.5	66.1	68.6	71.3

**Table 3-1-3-3 Foot length (cm)**

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	3	191	15.9	0.91	14.2	14.7	15.3	15.9	16.4	17.0	17.9
	4	185	16.8	1.06	15.1	15.6	16.2	16.8	17.5	18.0	18.8
	5	189	17.5	0.92	15.8	16.5	17.0	17.5	18.1	18.8	19.4
	6	98	18.5	1.08	16.6	17.0	17.7	18.5	19.4	20.0	20.3
F	3	102	15.2	0.88	13.8	14.2	14.7	15.2	15.6	16.3	16.8
	4	117	16.2	0.90	14.6	14.9	15.6	16.2	16.8	17.4	18.2
	5	106	17.1	0.97	15.1	15.8	16.4	17.0	17.8	18.2	18.9
	6	74	18.1	1.09	16.1	16.6	17.3	18.0	18.7	19.6	20.1

Table 3-1-3-4 Weight (kg)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	3	193	15.7	2.32	12.5	13.3	14.2	15.4	16.6	17.9	21.9
	4	185	17.7	2.65	14.0	14.6	15.9	17.2	19.1	21.3	23.7
	5	189	19.6	3.25	14.9	16.2	17.4	19.1	21.3	23.8	27.0
	6	98	22.8	4.77	16.2	18.0	19.5	21.7	25.0	29.3	35.4
F	3	102	15.1	2.45	12.0	12.6	13.5	14.5	16.0	17.9	20.6
	4	117	17.2	2.63	13.4	14.3	15.2	16.9	18.5	19.7	23.9
	5	107	18.8	2.99	14.6	15.6	16.7	18.2	20.5	23.3	26.2
	6	74	21.6	4.46	15.9	17.1	18.4	21.4	23.7	26.1	32.0

Table 3-1-3-5 BMI

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	3	192	15.6	1.38	13.7	14.2	14.7	15.5	16.4	17.0	19.5
	4	185	15.6	1.66	13.2	14.0	14.6	15.3	16.4	17.8	19.4
	5	189	15.6	1.7	13.4	13.9	14.4	15.3	16.3	18.1	20.2
	6	98	15.9	2.33	13.3	13.9	14.2	15.2	16.5	19.7	23.1
F	3	102	15.5	1.65	13.0	13.9	14.5	15.4	16.2	17.5	20.1
	4	117	15.5	1.65	13.3	13.8	14.5	15.3	16.1	16.9	19.1
	5	107	15.2	1.52	13.2	13.5	14.1	15.0	16.1	17.4	18.7
	6	74	15.4	2.27	12.4	13.3	14.0	14.9	16.3	17.6	21.2

Table 3-1-3-6 Weight status according to height for weight standards (%)

Gender	Age group (year)	n	Underweight	Slightly underweight	Normal	Slightly overweight	Overweight
M	3	192	0.5	6.8	82.8	4.7	5.2
	4	185	2.2	6.5	72.4	5.4	13.5
	5	189	0.5	8.5	74.1	5.3	11.6
	6	98	1.0	4.1	72.4	7.1	15.3
	<b>Total</b>	<b>664</b>	<b>1.0</b>	<b>6.8</b>	<b>75.9</b>	<b>5.4</b>	<b>10.8</b>
F	3	102	6.9	11.8	70.6	5.9	4.9
	4	117	2.6	13.7	73.5	3.4	6.8
	5	107	4.7	14.0	69.2	4.7	7.5
	6	74	10.8	14.9	58.1	9.5	6.8
	<b>Total</b>	<b>400</b>	<b>5.8</b>	<b>13.5</b>	<b>68.8</b>	<b>5.5</b>	<b>6.5</b>

Note: the results are calculated according to the bioassay standard of national physique.

Table 3-1-3-7 Chest circumference (cm)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	3	191	51.7	2.86	46.7	48.5	50.1	51.4	52.9	54.9	59.0
	4	185	53.6	3.14	48.7	50.1	51.6	53.1	55.4	57.5	61.4
	5	189	55.4	4.02	49.6	51.3	52.7	54.8	57.2	59.7	65.6
	6	98	58.1	5.19	50.8	53.4	55.0	57.5	60.2	64.1	71.2
F	3	102	50.5	3.06	46.0	47.3	48.9	49.9	51.8	54.0	58.9
	4	117	52.4	3.27	47.5	48.6	50.2	52.1	54.0	55.7	60.2
	5	107	53.8	3.47	49.2	50.1	51.4	53.3	55.4	58.5	62.8
	6	74	56.7	5.20	50.0	51.5	53.5	55.7	59.2	61.5	69.6

**Table 3-1-3-8 Waist circumference (cm)**

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	3	191	48.8	3.73	43.3	44.6	46.5	48.2	50.4	53.5	58.6
	4	185	50.4	4.64	43.2	45.5	47.4	49.5	52.6	56.4	60.8
	5	189	51.6	5.05	44.6	46.1	48.3	50.9	53.9	58.6	64.7
	6	98	54.7	6.87	46.6	47.8	50.3	53.1	56.6	65.6	73.5
F	3	102	48.5	4.04	43.3	44.2	45.7	48.0	50.1	53.3	56.3
	4	117	49.8	4.38	43.8	45.0	46.9	49.5	52.0	54.6	60.1
	5	107	50.2	4.09	44.0	46.2	47.4	49.2	52.2	56.0	62.0
	6	74	52.6	6.49	45.5	46.3	48.5	51.1	55.2	59.2	68.4

**Table 3-1-3-9 Hip circumference (cm)**

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	3	192	53.3	4.17	46.8	48.4	50.8	52.6	55.1	58.7	62.6
	4	185	55.8	4.62	48.9	51.0	52.6	55.0	58.1	62.0	65.6
	5	189	58.1	4.77	51.0	52.7	54.4	57.5	60.9	65.0	69.7
	6	97	62.5	6.19	53.3	56.1	57.7	61.2	66.2	71.5	77.0
F	3	102	53.2	4.12	47.5	48.7	50.0	52.6	55.5	58.1	61.4
	4	117	55.9	4.05	50.0	51.0	52.6	56.0	57.9	59.9	66.1
	5	107	57.7	4.44	51.2	52.8	54.4	57.1	60.0	65.0	68.0
	6	73	60.8	5.61	52.2	54.3	57.2	59.9	63.8	67.0	75.4

**Table 3-1-3-10 Waist to Hip Ratio (WHR)**

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	3	191	0.918	0.040	0.844	0.867	0.891	0.919	0.943	0.964	0.985
	4	185	0.902	0.046	0.815	0.844	0.875	0.902	0.925	0.956	0.993
	5	189	0.889	0.045	0.822	0.842	0.858	0.886	0.910	0.939	0.985
	6	97	0.874	0.046	0.797	0.818	0.840	0.870	0.902	0.942	0.992
F	3	102	0.912	0.036	0.835	0.866	0.888	0.912	0.937	0.955	0.974
	4	117	0.891	0.040	0.820	0.844	0.864	0.885	0.916	0.947	0.987
	5	107	0.870	0.037	0.805	0.827	0.840	0.869	0.897	0.915	0.947
	6	73	0.863	0.045	0.792	0.817	0.842	0.856	0.884	0.917	0.975

**Table 3-1-3-11 Shoulder width (cm)**

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	3	192	21.5	1.35	19.1	19.8	20.6	21.5	22.3	23.1	24.2
	4	185	22.7	1.45	20.3	21.0	21.9	22.6	23.6	24.6	25.4
	5	189	24.1	1.44	21.2	22.2	23.1	24.0	25.0	26.0	27.0
	6	98	25.4	2.11	18.8	23.3	24.5	25.6	26.7	27.6	28.7
F	3	102	21.9	1.48	19.5	20.2	21.1	21.8	22.6	23.6	24.4
	4	117	23.4	1.40	21.0	21.7	22.2	23.3	24.3	25.2	26.3
	5	107	24.1	1.49	21.5	22.5	23.4	24.1	25.0	25.8	26.6
	6	74	25.5	1.87	21.6	23.3	24.6	25.6	26.6	27.3	29.6



**Table 3-1-3-12 Pelvis width (cm)**

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	3	192	16.0	1.18	14.2	14.7	15.3	15.9	16.4	17.3	18.0
	4	185	16.8	1.11	15.0	15.5	16.0	16.7	17.6	18.4	18.7
	5	189	17.6	1.15	15.7	16.4	16.9	17.6	18.2	19.0	20.4
	6	98	18.6	1.40	16.2	17.0	17.6	18.5	19.6	20.3	21.5
F	3	102	15.9	1.13	14.0	14.7	15.3	15.8	16.5	17.0	18.4
	4	117	16.9	1.07	15.2	15.8	16.2	16.9	17.6	18.3	19.2
	5	107	17.5	1.20	15.5	16.0	16.8	17.4	18.2	19.5	19.9
	6	74	18.4	1.36	15.7	16.6	17.6	18.5	19.1	20.0	21.3

**Table 3-1-3-13 Upper arm skinfold thickness (mm)**

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	3	192	7.7	3.01	3.9	4.5	5.5	7.0	9.0	11.5	15.0
	4	185	8.3	3.90	2.3	4.0	5.5	7.5	10.0	13.2	18.7
	5	189	7.9	3.88	2.9	4.0	5.5	7.0	9.5	13.0	19.2
	6	98	8.5	4.78	2.5	4.0	5.0	7.5	10.6	15.6	21.5
F	3	102	10.8	4.26	4.5	6.0	7.9	10.0	13.0	17.4	20.5
	4	117	10.9	3.59	5.3	6.9	8.5	11.0	12.5	15.0	18.4
	5	107	10.9	3.84	5.0	6.0	8.0	10.5	13.5	16.5	20.9
	6	74	10.0	4.66	3.8	5.5	7.0	9.3	11.5	16.3	23.9

**Table 3-1-3-14 Subscapular skinfold thickness (mm)**

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	3	192	3.6	2.25	1.0	1.5	2.5	3.5	4.4	6.0	7.6
	4	185	3.8	2.54	0.8	1.5	2.0	3.0	5.0	6.5	11.0
	5	189	4.2	3.18	1.0	1.5	2.5	3.5	5.0	7.5	12.2
	6	98	4.6	4.56	0.5	1.0	2.0	3.0	5.0	11.5	20.0
F	3	101	6.1	3.37	1.0	2.0	3.8	5.5	7.5	9.9	15.9
	4	117	6.5	3.20	1.0	3.5	5.0	6.0	7.5	9.2	14.2
	5	107	5.7	3.06	1.1	2.0	4.0	5.0	7.0	9.0	14.9
	6	74	6.0	4.19	1.0	2.8	3.5	5.0	6.5	11.0	19.5

**Table 3-1-3-15 Abdominal skinfold thickness (mm)**

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	3	191	4.1	3.25	0.5	1.0	2.0	3.5	5.0	8.0	11.2
	4	185	4.7	3.97	0.5	1.0	2.0	4.0	6.5	9.2	15.0
	5	189	5.3	4.53	0.5	1.5	2.5	4.0	6.0	10.5	18.7
	6	98	6.4	6.54	0.5	1.0	2.0	4.3	7.0	16.3	26.0
F	3	102	6.9	4.21	1.0	2.5	4.4	5.8	9.1	11.0	17.0
	4	117	7.9	4.19	1.3	3.5	5.5	7.0	9.5	12.1	18.0
	5	107	7.4	4.33	1.5	2.5	4.5	6.5	9.0	13.5	20.8
	6	74	8.4	5.80	1.6	3.0	4.5	6.5	10.5	15.5	25.6

**1.4. Physiological Function**

**Table 3-1-4-1** Resting heart rate (beats/min - bpm)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	3	192	99.0	8.60	81.6	88.0	94.0	100.0	104.0	108.0	114.0
	4	185	97.1	9.58	82.0	86.0	90.0	96.0	102.0	108.8	118.8
	5	189	94.8	8.30	80.0	86.0	89.0	96.0	100.0	104.0	112.6
	6	98	93.2	8.06	74.0	82.0	88.0	92.0	98.0	104.0	108.1
F	3	101	100.1	9.76	82.1	88.0	95.0	100.0	105.0	110.0	119.9
	4	117	97.0	9.17	78.0	88.0	90.0	98.0	102.0	108.4	117.8
	5	107	94.4	8.83	80.0	83.6	88.0	94.0	100.0	104.4	114.6
	6	74	92.2	9.16	74.5	80.0	86.8	92.0	98.0	103.0	113.5

**1.5. Physical Fitness**

**Table 3-1-5-1** 10 m shuttle run (sec)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	3	193	9.8	2.04	7.5	7.9	8.6	9.4	10.6	11.6	14.1
	4	184	8.0	1.05	6.5	6.8	7.1	7.9	8.5	9.3	10.6
	5	187	6.9	0.64	6.0	6.2	6.5	6.9	7.2	7.8	8.5
	6	98	6.6	0.48	5.8	6.1	6.3	6.5	6.8	7.1	7.7
F	3	99	10.1	2.02	7.5	8.3	8.8	9.8	10.7	12.2	16.8
	4	115	8.3	1.13	6.7	7.0	7.5	8.2	8.8	10.0	11.1
	5	105	7.1	0.77	6.2	6.4	6.6	7.0	7.4	7.9	8.9
	6	74	6.8	0.40	6.0	6.3	6.5	6.7	7.1	7.4	7.7

**Table 3-1-5-2** Successive jumps with both feet (sec)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	3	146	12.6	4.85	6.1	7.0	8.8	11.7	15.5	18.7	25.5
	4	176	9.2	3.37	5.2	5.9	6.9	8.6	10.6	13.4	18.9
	5	179	7.6	2.54	4.8	5.2	5.6	7.0	8.9	10.5	14.6
	6	96	6.9	1.88	4.4	5.1	5.7	6.4	7.7	9.6	12.3
F	3	77	12.4	5.34	6.4	7.2	8.8	11.3	14.4	18.9	28.9
	4	113	9.1	3.00	5.8	6.3	6.8	8.3	10.3	13.3	15.6
	5	103	7.4	2.14	4.6	5.1	6.0	7.2	8.2	10.1	12.8
	6	74	6.9	1.37	4.9	5.3	5.8	6.5	7.7	9.1	9.7

**Table 3-1-5-3** Standing long jump (cm)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	3	190	52.7	18.55	20.5	32.1	39.8	49.0	66.0	77.9	85.0
	4	185	73.3	18.96	34.6	42.6	64.0	76.0	86.0	94.0	103.8
	5	189	91.6	19.96	50.0	66.0	80.0	92.0	105.0	117.0	131.2
	6	98	103.0	16.28	72.0	83.7	91.0	102.5	114.0	123.2	140.1
F	3	100	46.9	17.96	15.0	23.4	36.0	44.5	62.8	71.0	76.9
	4	116	68.6	17.09	35.0	43.4	57.5	71.0	81.0	90.3	98.0
	5	107	90.2	13.62	68.0	74.0	81.0	89.0	98.0	106.8	120.3
	6	74	96.2	14.16	69.8	78.5	89.8	98.5	103.0	112.5	126.8

**Table 3-1-5-4 Tennis ball distance throw (m)**

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	3	193	2.7	1.01	1.4	1.5	2.0	2.5	3.3	4.0	5.1
	4	185	3.9	1.43	1.5	2.5	3.0	3.5	4.5	6.0	7.2
	5	189	5.1	1.47	2.5	3.5	4.0	5.0	6.0	7.0	8.5
	6	98	6.3	1.76	3.0	4.5	5.0	6.0	7.5	9.0	10.0
F	3	100	2.2	0.95	0.5	1.1	1.5	2.0	2.5	3.0	4.0
	4	117	3.2	1.07	1.5	2.0	2.5	3.0	4.0	4.6	5.5
	5	107	4.5	1.18	2.5	3.0	3.5	4.5	5.0	6.0	6.9
	6	74	5.3	1.30	3.0	3.8	4.5	5.0	6.0	6.8	8.5

**Table 3-1-5-5 Sit and reach (cm)**

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	3	191	8.4	4.62	-1.1	1.7	5.3	9.0	11.4	14.4	16.3
	4	185	7.7	4.54	-2.3	1.4	4.6	8.0	11.1	13.3	15.3
	5	188	6.5	5.31	-4.0	-0.2	3.5	6.6	10.0	13.4	15.8
	6	98	5.1	6.11	-8.2	-3.2	1.0	5.3	9.6	12.6	17.3
F	3	101	10.7	5.53	-3.5	3.6	7.5	11.7	14.3	17.0	18.8
	4	117	10.4	5.08	-1.9	2.0	7.3	11.6	14.0	15.7	17.1
	5	107	9.5	5.17	-1.1	2.2	6.5	9.5	13.0	17.3	18.9
	6	74	7.8	5.14	-2.7	0.0	4.3	8.1	11.9	13.9	17.0

**Table 3-1-5-6 Walking on balance beam (sec)**

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	3	181	22.0	14.87	4.6	7.8	11.2	16.6	30.5	45.3	54.2
	4	181	13.7	9.70	4.1	4.9	7.1	11.1	16.4	28.2	40.5
	5	189	9.5	6.95	3.5	4.0	5.4	7.6	10.4	17.8	31.6
	6	98	7.0	4.11	3.1	3.6	4.3	5.9	8.0	12.6	19.0
F	3	96	22.7	14.40	4.9	8.3	12.6	18.5	29.3	46.6	57.3
	4	113	11.9	8.71	3.8	5.0	6.3	10.1	13.9	19.1	44.9
	5	106	9.8	8.61	3.1	3.9	5.3	7.4	11.4	19.7	25.4
	6	74	7.5	3.79	3.0	4.3	4.9	5.9	9.6	14.2	18.0

**1.6. Health**

**Table 3-1-6-1 Primary teeth decay (%)**

Gender	Age group (year)	Subjects (n)	Decayed primary teeth (d)	Decayed primary teeth filled (f)	Decayed primary teeth loss (m)	Primary teeth decayed, filled and loss (dmf)
M	3	193	42.5	3.6	0.5	44.0
	4	185	54.1	3.2	1.1	55.1
	5	189	55.0	9.5	3.2	57.7
	6	98	63.3	15.3	1.0	65.3
F	3	102	40.2	3.9	0.0	40.2
	4	117	39.3	4.3	0.9	42.7
	5	107	60.7	10.3	0.9	61.7
	6	74	63.5	13.5	2.7	64.9

**Table 3-1-6-2 Permanent teeth decay (%)**

Gender	Age group (year)	Subjects (n)	Decayed permanent teeth (D)	Decayed permanent teeth filled (F)	Decayed permanent teeth loss (M)	Permanent teeth, decayed, filled and loss (DMF)
M	3	193	0.0	0.0	0.0	0.0
	4	185	0.0	0.0	0.0	0.0
	5	189	0.5	0.0	0.0	0.5
	6	98	3.1	0.0	0.0	3.1
F	3	102	0.0	0.0	0.0	0.0
	4	117	0.0	0.0	0.0	0.0
	5	107	1.9	0.0	0.0	1.9
	6	74	2.7	0.0	0.0	2.7

## 2. Children and Adolescents (Students)

### 2.1. Basic Information of the Subjects

**Table 3-2-1-1 Distribution of sampling sites (schools/universities)**

Subjects	Survey area	Sampling sites	M		F		Total		
			Subjects (n)	Percentage (%)	Subjects (n)	Percentage (%)	Subjects (n)	Percentage (%)	
Primary & secondary school students	north	Keang Peng School	320	14.0	345	16.3	665	15.1	
		Hou Kong Middle School	445	19.5	359	17.0	804	18.3	
	central	Pui Ching Middle School	432	19.0	383	18.1	815	18.6	
		Chan Sui Ki Perpetual Help College	323	14.2	404	19.1	727	16.6	
	south	Pooi To Middle School	353	15.5	269	12.7	622	14.2	
		Estrela do Mar School	406	17.8	353	16.7	759	17.3	
	<b>Total</b>			<b>2279</b>	<b>100</b>	<b>2113</b>	<b>100</b>	<b>4392</b>	<b>100</b>
	University students	Na. Sra. do Carmo	University of Macau	117	36.1	199	48.1	316	42.8
Macao University of Science and Technology			73	22.5	31	7.5	104	14.1	
Sé Catedral		Macao Polytechnic Institute	64	19.8	52	12.6	116	15.7	
S. António		Kiang Wu Nursing College of Macau	12	3.7	72	17.4	84	11.4	
Na. Sra. de Fátima		Institute for Tourism Studies	15	4.6	17	4.1	32	4.3	
Others			43	13.3	43	10.4	86	11.7	
<b>Total</b>			<b>324</b>	<b>100</b>	<b>414</b>	<b>100</b>	<b>738</b>	<b>100</b>	

**Table 3-2-1-2 Residential distribution of subjects (%)**

Gender	Communities	Keang Peng School	Hou Kong Middle School	Pui Ching Middle School	Chan Sui Ki Perpetual Help College	Pooi To Middle School	Estrela do Mar School	University of Macau	Macao University of Science and Technology	Macao Polytechnic Institute	Kiang Wu Nursing College of Macau	Institute for Tourism Studies	Others	Total
M	S.Francisco	0.0	0.0	0.2	0.0	0.6	0.0	0.0	0.0	1.6	0.0	0.0	0.0	0.2
	Na.Sra.do Carmo	0.6	2.5	12.5	10.5	9.3	3.9	6.0	6.8	3.1	0.0	0.0	14.0	6.5
	S.Lourenço	0.3	2.5	4.4	3.4	13.6	65.8	7.7	13.7	9.4	0.0	40.0	9.3	15.1
	Sé Catedral	0.0	2.5	8.6	12.4	27.5	6.4	10.3	13.7	7.8	0.0	0.0	9.3	9.3
	S.António	6.3	44.5	44.7	29.1	19.5	9.4	23.9	23.3	25.0	8.3	6.7	14.0	26.1
	S.Lázaro	1.9	6.4	12.7	21.4	7.1	1.0	3.4	1.4	6.3	25.0	0.0	2.3	7.7
	Na.Sra.de Fátima	90.9	41.6	16.9	23.2	22.4	13.5	48.7	41.1	46.9	66.7	53.3	51.2	35.1
F	S.Francisco	0.0	0.0	0.3	0.0	0.4	0.0	0.0	0.0	1.9	0.0	0.0	0.0	0.1
	Na.Sra.do Carmo	0.3	2.3	10.5	12.1	7.5	2.3	11.1	6.5	3.8	1.4	17.6	4.7	6.3
	S.Lourenço	0.3	1.7	2.9	4.7	15.3	70.5	5.5	3.2	11.5	5.6	5.9	7.0	14.0
	Sé Catedral	0.6	2.8	8.6	8.2	25.7	5.4	5.0	12.9	7.7	8.3	0.0	4.7	7.6
	S.António	8.1	45.2	44.2	31.9	20.9	5.7	23.6	32.3	19.2	34.7	17.6	20.9	26.4
	S.Lázaro	1.2	5.1	14.1	18.6	8.6	1.1	5.5	3.2	3.8	11.1	5.9	4.7	8.1
	Na.Sra.de Fátima	89.6	42.9	19.4	24.5	21.6	15.0	49.2	41.9	51.9	38.9	52.9	58.1	37.5

**Table 3-2-1-3 Birth place (%)**

Gender	Place of birth	6~12 years old (primary school)	13~18 years old (middle school)	19~22 years old (university)	Total
M	Mainland	12.2	11.4	20.8	13.1
	Macao	82.9	85.5	74.5	82.7
	Hong Kong	2.3	1.9	4.5	2.5
	Others	2.6	1.2	0.3	1.7
F	Mainland	11.4	13.5	25.5	14.6
	Macao	84.7	84.3	71.9	82.4
	Hong Kong	2.5	1.5	2.6	2.1
	Others	1.4	0.7	0.0	0.9

**Table 3-2-1-4 School attendance (%)**

Gender	Schooling	6~12 years old (primary school)	13~18 years old (middle school)	19~22 years old (university)	Total
M	Never	0.0	0.0	0.5	0.1
	Half day	1.3	1.9	12.1	3.2
	Full day	98.7	98.0	86.1	96.5
	Boarding	0.0	0.1	1.3	0.2
F	Half day	1.3	0.8	11.7	2.8
	Full day	98.5	99.0	87.9	97.0
	Boarding	0.2	0.2	0.5	0.2

2.2. Lifestyle

**Table 3-2-2-1 Total time spent commuting to and from school per day (male) (%)**

Age group(year)	Subjects (n)	Within 30 mins	30 mins~1hr	1~2 hrs	2 hrs or more
6	104	76.0	20.2	3.8	0.0
7	201	72.6	22.4	5.0	0.0
8	172	69.8	23.3	5.8	1.2
9	202	75.7	19.8	3.5	1.0
10	173	77.5	21.4	1.2	0.0
11	149	72.5	23.5	3.4	0.7
12	196	69.4	24.5	5.6	0.5
13	185	66.5	28.6	4.3	0.5
14	162	64.2	29.0	6.2	0.6
15	188	64.9	29.8	4.3	1.1
16	162	66.0	25.3	8.6	0.0
17	186	57.5	31.7	10.2	0.5
18	143	54.5	30.8	13.3	1.4
19	101	60.4	31.7	6.9	1.0
20	96	46.9	40.6	12.5	0.0
21	95	43.2	49.5	7.4	0.0
22	87	54.0	32.2	13.8	0.0

**Table 3-2-2-2 Total time spent commuting to and from school per day (female) (%)**

Age group(year)	Subjects (n)	Within 30 mins	30 mins~1 hr	1~2 hrs	2 hrs or more
6	94	61.7	35.1	2.1	1.1
7	159	71.1	24.5	4.4	0.0
8	146	80.1	15.1	4.8	0.0
9	155	75.5	20.6	3.2	0.6
10	147	80.3	17.0	2.7	0.0
11	151	70.9	24.5	2.6	2.0
12	175	66.9	28.0	5.1	0.0
13	159	67.9	25.2	6.9	0.0
14	176	61.4	27.8	10.2	0.6
15	169	56.8	33.1	9.5	0.6
16	187	60.4	33.2	5.9	0.5
17	203	59.6	31.5	7.4	1.5
18	186	50.5	37.6	11.3	0.5
19	128	53.1	31.3	15.6	0.0
20	99	45.5	35.4	17.2	2.0
21	100	34.0	48.0	17.0	1.0
22	93	41.9	37.6	20.4	0.0

**Table 3-2-2-3** Transportation means to and from school (male)(%)

Age group(year)	Subjects (n)	On foot	By motorcycle	By bus	By car
6	104	41.3	20.2	17.3	21.2
7	201	48.8	11.9	19.4	19.9
8	172	52.9	14.5	18.6	14.0
9	202	56.4	7.9	18.8	16.8
10	173	63.0	10.4	16.8	9.8
11	149	54.4	7.4	20.8	17.4
12	196	57.1	5.6	24.0	13.3
13	185	67.6	5.4	19.5	7.6
14	162	71.0	0.6	23.5	4.9
15	188	66.5	0.5	27.1	5.9
16	162	69.1	1.2	23.5	6.2
17	186	60.2	2.2	32.8	4.8
18	143	48.3	6.3	44.8	0.7
19	101	42.6	28.7	24.8	4.0
20	96	14.6	38.5	43.8	3.1
21	95	9.5	58.9	28.4	3.2
22	87	4.6	52.9	41.4	1.1

**Table 3-2-2-4** Transportation means to and from school (female)(%)

Age group(year)	Subjects (n)	On foot	By motorcycle	By bus	By car
6	94	46.8	10.6	26.6	16.0
7	159	53.5	15.1	17.0	14.5
8	146	64.4	9.6	14.4	11.6
9	155	54.8	11.6	15.5	18.1
10	147	59.9	8.2	15.6	16.3
11	151	58.9	9.9	17.2	13.9
12	175	57.1	7.4	25.7	9.7
13	159	66.7	5.7	20.1	7.5
14	176	65.9	4.5	23.3	6.3
15	169	62.7	1.8	26.0	9.5
16	187	66.3	4.8	22.5	6.4
17	203	64.5	0.5	28.6	6.4
18	186	52.2	5.9	39.2	2.7
19	128	46.9	15.6	37.5	0.0
20	99	20.2	21.2	54.5	4.0
21	100	11.0	26.0	61.0	2.0
22	93	11.8	25.8	55.9	6.5

**Table 3-2-2-5** Average accumulative time for daily outdoor activities (male) (%)

Age group (year)	Subjects (n)	Within 30 mins	30 mins~1 hr	1~2 hrs	2 hrs or more
6	104	54.8	37.5	5.8	1.9
7	201	54.2	36.8	6.5	2.5
8	172	55.2	32.0	8.1	4.7
9	201	54.2	28.9	10.9	6.0
10	173	54.9	28.3	12.1	4.6
11	148	45.9	34.5	13.5	6.1
12	196	48.0	27.0	12.8	12.2
13	185	42.2	27.0	18.9	11.9
14	162	47.5	24.1	13.6	14.8
15	188	43.6	27.1	14.4	14.9
16	162	44.4	22.2	18.5	14.8
17	186	50.5	23.7	14.5	11.3
18	143	40.6	30.1	17.5	11.9
19	101	55.4	26.7	12.9	5.0
20	96	50.0	29.2	10.4	10.4
21	95	40.0	30.5	22.1	7.4
22	87	64.4	17.2	8.0	10.3

**Table 3-2-2-6** Average accumulative time for daily outdoor activities (female) (%)

Age group (year)	Subjects (n)	Within 30 mins	30 mins~1 hr	1~2 hrs	2 hrs or more
6	94	54.3	34.0	7.4	4.3
7	159	59.1	34.6	3.1	3.1
8	146	56.8	24.0	17.1	2.1
9	155	53.5	29.7	13.5	3.2
10	147	57.1	33.3	5.4	4.1
11	151	57.6	27.2	8.6	6.6
12	175	49.1	27.4	15.4	8.0
13	159	42.8	34.0	12.6	10.7
14	176	48.3	24.4	13.6	13.6
15	169	49.1	23.1	14.8	13.0
16	187	53.5	25.1	11.8	9.6
17	203	60.6	23.2	10.8	5.4
18	186	70.4	17.2	7.5	4.8
19	128	64.8	19.5	11.7	3.9
20	98	59.2	27.6	7.1	6.1
21	99	68.7	21.2	6.1	4.0
22	93	68.8	15.1	10.8	5.4



**Table 3-2-2-7** Time spent daily on homework (male) (%)

Age group (year)	Subjects (n)	Within 30 mins	30 mins~1 hr	1~2 hrs	2~3 hrs	3 hrs or more
6	104	13.5	29.8	31.7	16.3	8.7
7	201	12.4	35.3	38.3	8.5	5.5
8	172	12.2	29.1	31.4	16.9	10.5
9	202	18.3	26.2	34.2	15.8	5.4
10	173	7.5	34.7	28.3	16.8	12.7
11	148	12.2	34.5	27.7	14.9	10.8
12	196	14.3	28.1	28.1	22.4	7.1
13	185	18.4	33.0	25.9	14.1	8.6
14	162	21.6	32.1	20.4	14.8	11.1
15	188	20.7	34.0	22.9	14.9	7.4
16	162	21.0	32.7	25.9	11.7	8.6
17	186	24.7	29.0	28.5	13.4	4.3
18	143	23.1	31.5	23.8	11.9	9.8
19	101	31.7	28.7	26.7	7.9	5.0
20	96	25.0	43.8	22.9	5.2	3.1
21	95	35.8	28.4	26.3	0.0	9.5
22	87	6.9	39.1	32.2	14.9	6.9

**Table 3-2-2-8** Time spent daily on homework (female) (%)

Age group (year)	Subjects (n)	Within 30 mins	30 mins~1 hr	1~2 hrs	2~3 hrs	3 hrs or more
6	94	6.4	35.1	40.4	11.7	6.4
7	159	8.2	37.1	29.6	19.5	5.7
8	146	9.6	30.8	39.0	16.4	4.1
9	155	14.8	25.2	31.0	19.4	9.7
10	147	10.2	32.7	29.3	19.0	8.8
11	151	8.6	34.4	23.8	24.5	8.6
12	175	6.3	30.3	33.1	20.6	9.7
13	158	12.7	29.7	27.8	17.1	12.7
14	176	18.2	25.0	33.0	11.9	11.9
15	169	11.8	26.6	36.7	14.8	10.1
16	187	7.0	29.4	34.8	17.1	11.8
17	203	9.9	28.6	29.6	16.7	15.3
18	186	15.6	20.4	30.1	23.1	10.8
19	128	18.0	25.8	28.1	16.4	11.7
20	98	16.3	25.5	33.7	15.3	9.2
21	99	16.2	28.3	31.3	12.1	12.1
22	93	15.1	34.4	16.1	22.6	11.8

**Table 3-2-2-9 Average time spent on watching TV, video and playing video games per day (male) (%)**

Age group (year)	Subjects (n)	Within 30 mins	30 mins~1 hr	1~2 hrs	2~3 hrs	3 hrs or more
6	104	18.3	32.7	35.6	8.7	4.8
7	201	17.9	36.8	30.8	7.0	7.5
8	172	16.9	28.5	32.0	12.2	10.5
9	202	13.9	30.2	29.7	14.9	11.4
10	173	11.0	30.1	35.8	12.7	10.4
11	148	4.7	26.4	34.5	19.6	14.9
12	196	12.2	22.4	29.6	19.9	15.8
13	185	3.2	15.7	23.8	25.4	31.9
14	162	3.7	14.8	19.1	30.2	32.1
15	188	3.7	9.6	29.8	19.7	37.2
16	162	2.5	13.0	34.6	24.7	25.3
17	186	5.9	12.4	25.3	24.2	32.3
18	143	2.1	12.6	23.8	31.5	30.1
19	102	2.0	9.8	29.4	25.5	33.3
20	96	7.3	8.3	29.2	24.0	31.3
21	95	4.2	3.2	44.2	6.3	42.1
22	87	4.6	10.3	32.2	19.5	33.3

**Table 3-2-2-10 Average time spent on watching TV, video and playing video games per day (female) (%)**

Age group (year)	Subjects (n)	Within 30 mins	30 mins~1 hr	1~2 hrs	2~3 hrs	3 hrs or more
6	94	20.2	41.5	25.5	10.6	2.1
7	159	18.9	41.5	27.7	8.8	3.1
8	146	18.5	33.6	29.5	11.0	7.5
9	155	12.9	31.0	31.0	18.7	6.5
10	147	13.6	36.7	31.3	10.9	7.5
11	151	8.6	24.5	31.1	23.2	12.6
12	175	8.0	21.7	32.0	21.1	17.1
13	159	2.5	13.8	30.8	22.0	30.8
14	176	4.0	18.8	27.3	22.7	27.3
15	169	3.6	9.5	26.6	36.1	24.3
16	187	1.6	13.4	29.9	26.2	28.9
17	203	2.0	12.8	31.0	29.1	25.1
18	186	3.2	14.5	31.7	24.7	25.8
19	128	6.3	7.8	28.9	28.9	28.1
20	99	3.0	15.2	24.2	31.3	26.3
21	100	2.0	11.0	26.0	27.0	34.0
22	93	1.1	6.5	29.0	26.9	36.6

**Table 3-2-2-11** Average daily sleeping hours (male) (%)

Age group (year)	Subjects (n)	Less than 8 hrs	8~10 hrs	10 hrs or more
6	104	7.7	86.5	5.8
7	201	9.0	88.1	3.0
8	172	14.5	82.0	3.5
9	202	19.8	76.2	4.0
10	173	18.5	76.9	4.6
11	149	29.5	66.4	4.0
12	196	32.1	65.3	2.6
13	185	38.4	60.5	1.1
14	162	57.4	40.1	2.5
15	188	63.8	35.1	1.1
16	162	59.9	38.3	1.9
17	186	73.1	25.8	1.1
18	143	76.9	22.4	0.7
19	102	75.5	21.6	2.9
20	96	82.3	17.7	0.0
21	95	82.1	17.9	0.0
22	87	80.5	19.5	0.0

**Table 3-2-2-12** Average daily sleeping hours (female) (%)

Age group (year)	Subjects (n)	Less than 8 hrs	8~10 hrs	10 hrs or more
6	94	10.6	88.3	1.1
7	159	14.5	83.0	2.5
8	146	13.7	84.9	1.4
9	154	13.0	83.8	3.2
10	147	19.7	76.9	3.4
11	151	19.2	76.8	4.0
12	175	37.7	61.7	0.6
13	159	59.1	38.4	2.5
14	176	61.9	35.8	2.3
15	169	67.5	32.0	0.6
16	187	75.9	23.5	0.5
17	203	85.2	14.8	0.0
18	186	80.1	18.8	1.1
19	128	77.3	21.9	0.8
20	99	69.7	30.3	0.0
21	99	75.8	23.2	1.0
22	93	86.0	14.0	0.0

**Table 3-2-2-13** **Hobby class participation (male) (%)**

Age group (year)	Subjects (n)	None	Physical exercise	Tutoring	Chess	Music & dancing	Drawing & calligraphy	Others
6	104	32.7	22.1	19.2	1.0	23.1	19.2	14.4
7	201	33.3	21.4	23.4	2.0	20.9	16.4	19.4
8	172	26.7	27.3	29.1	9.3	14.0	15.7	21.5
9	202	26.7	35.6	24.8	9.9	19.8	14.4	23.8
10	173	25.4	33.5	20.2	8.7	24.3	13.3	19.1
11	149	20.3	39.2	18.2	6.1	20.9	8.8	22.3
12	196	37.8	30.1	15.8	6.6	11.7	6.6	26.5
13	185	37.3	28.1	13.0	4.9	16.2	9.2	23.8
14	162	37.0	24.7	16.7	6.2	19.1	4.9	22.2
15	188	35.1	36.7	14.4	5.9	19.1	6.4	19.7
16	162	29.6	37.0	12.3	6.2	21.6	2.5	24.1
17	186	37.6	33.9	18.3	6.5	18.8	2.7	23.1
18	143	40.6	40.6	16.1	6.3	11.9	3.5	22.4
19	102	45.1	36.3	10.8	4.9	13.7	2.9	17.6
20	96	44.8	38.5	6.3	5.2	18.8	1.0	19.8
21	95	49.5	37.9	9.5	0.0	12.6	0.0	15.8
22	87	71.3	18.4	8.0	1.1	1.1	0.0	17.2

**Table 3-2-2-14** **Hobby class participation (Female) (%)**

Age group (year)	Subjects (n)	None	Physical exercise	Tutoring	Chess	Music & dancing	Drawing & calligraphy	Others
6	94	18.1	10.6	26.6	2.1	53.2	20.2	12.8
7	159	23.9	15.1	25.2	0.0	50.3	35.2	13.2
8	146	22.6	17.1	15.8	3.4	43.8	27.4	21.9
9	154	19.4	18.7	29.0	2.6	43.2	22.6	19.4
10	147	16.3	19.7	18.4	4.1	46.3	23.1	21.1
11	151	18.0	30.7	18.0	1.3	50.0	22.7	16.7
12	175	25.1	26.3	14.9	2.9	39.4	17.1	21.7
13	159	35.2	18.9	14.5	1.3	32.1	16.4	17.6
14	176	25.1	20.6	20.0	1.1	37.7	14.3	23.4
15	169	24.9	17.8	23.1	1.8	41.4	18.9	24.3
16	187	31.0	13.4	23.0	1.6	38.0	7.5	21.9
17	203	35.0	15.3	15.8	0.0	36.0	9.4	24.1
18	186	44.1	16.1	19.9	1.6	25.3	3.8	16.7
19	128	46.1	17.2	14.1	0.0	34.4	10.2	13.3
20	99	44.4	14.1	15.2	1.0	25.3	10.1	15.2
21	99	36.0	20.0	19.0	2.0	25.0	6.0	16.0
22	93	50.5	22.6	11.8	0.0	19.4	6.5	5.4

**Table 3-2-2-15** Frequency of physical education (PE) class per week (male)(%)

Age group (year)	Subjects (n)	Once	Twice	Three times	Four times or more	Never
6	104	43.3	56.7	0.0	0.0	0.0
7	201	36.3	60.7	2.5	0.5	0.0
8	172	40.1	55.8	1.2	1.7	1.2
9	202	43.1	55.0	1.0	0.0	1.0
10	173	45.1	54.9	0.0	0.0	0.0
11	149	55.7	42.3	0.7	0.7	0.7
12	196	63.3	36.7	0.0	0.0	0.0
13	185	60.0	39.5	0.0	0.0	0.5
14	162	67.3	32.7	0.0	0.0	0.0
15	188	69.7	30.3	0.0	0.0	0.0
16	162	72.8	27.2	0.0	0.0	0.0
17	186	72.0	27.4	0.0	0.0	0.5
18	143	52.4	37.8	0.0	0.7	9.1
19	101	43.6	19.8	0.0	0.0	36.6
20	96	29.2	5.2	2.1	0.0	63.5
21	95	12.6	6.3	0.0	0.0	81.1
22	87	18.4	2.3	1.1	0.0	78.2

**Table 3-2-2-16** Frequency of physical education (PE) class per week (female)(%)

Age group (year)	Subjects (n)	Once	Twice	Three times	Four times or more	Never
6	94	55.3	44.7	0.0	0.0	0.0
7	159	39.0	58.5	1.9	0.0	0.6
8	146	36.3	63.0	0.7	0.0	0.0
9	155	43.9	55.5	0.0	0.0	0.6
10	147	49.7	47.6	0.7	1.4	0.7
11	151	57.0	41.1	0.0	0.7	1.3
12	175	64.6	34.9	0.0	0.6	0.0
13	159	63.5	36.5	0.0	0.0	0.0
14	176	67.0	33.0	0.0	0.0	0.0
15	169	72.2	27.8	0.0	0.0	0.0
16	187	70.6	28.9	0.0	0.5	0.0
17	203	74.4	24.6	0.0	0.0	1.0
18	186	47.3	34.9	0.0	0.0	17.7
19	128	38.3	22.7	0.0	0.0	39.1
20	99	36.4	8.1	0.0	0.0	55.6
21	100	29.0	5.0	2.0	0.0	64.0
22	93	31.2	0.0	0.0	0.0	68.8

**Table 3-2-2-17** Session participation in each physical education (PE) class (male)(%)

Age group (year)	Subjects who participated in PE classes	1 session	2 sessions	At least 2 sessions
6	104	53.8	46.2	0.0
7	201	68.2	30.8	1.0
8	170	66.7	32.2	1.2
9	200	67.3	31.7	1.0
10	173	67.1	32.9	0.0
11	148	66.9	32.4	0.7
12	196	42.3	57.7	0.0
13	184	42.7	56.8	0.5
14	162	35.2	64.8	0.0
15	188	41.0	58.5	0.5
16	162	37.0	63.0	0.0
17	185	45.9	54.1	0.0
18	130	62.3	36.2	1.5
19	64	57.8	42.2	0.0
20	35	72.2	25.0	2.8
21	18	72.2	22.2	5.6
22	19	100.0	0.0	0.0

**Table 3-2-2-18** Session participation in each physical education (PE) class (Female)(%)

Age group (year)	Subjects who participated in PE classes	1 session	2 sessions	At least 2 sessions
6	94	46.8	53.2	0.0
7	158	59.7	37.7	2.5
8	146	65.1	34.9	0.0
9	154	69.7	29.7	0.6
10	146	65.1	33.6	1.4
11	149	54.0	45.3	0.7
12	175	41.1	58.9	0.0
13	159	38.4	61.6	0.0
14	176	33.5	65.9	0.6
15	169	45.0	55.0	0.0
16	187	59.9	40.1	0.0
17	201	50.2	49.8	0.0
18	153	61.4	38.6	0.0
19	78	71.8	28.2	0.0
20	44	81.8	18.2	0.0
21	36	91.7	8.3	0.0
22	29	89.7	6.9	3.4

**Table 3-2-2-19** Self-perceived intensity of PE class (male) (%)

Age group (year)	Subjects who participated in PE classes	Low	Moderate	High
6	104	27.9	53.8	18.3
7	201	24.9	52.7	22.4
8	170	24.0	60.2	15.8
9	200	22.9	58.2	18.9
10	173	15.6	67.1	17.3
11	147	24.5	57.1	18.4
12	195	20.0	57.9	22.1
13	184	23.8	56.8	19.5
14	162	17.9	64.2	17.9
15	188	18.6	62.8	18.6
16	162	19.1	63.6	17.3
17	185	24.3	60.0	15.7
18	130	23.8	60.0	16.2
19	64	21.9	57.8	20.3
20	35	27.8	55.6	16.7
21	18	16.7	72.2	11.1
22	19	15.8	42.1	42.1

**Table 3-2-2-20** Self-perceived intensity of PE class (Female) (%)

Age group (year)	Subjects who participated in PE classes	Low	Moderate	High
6	94	26.6	63.8	9.6
7	158	26.4	57.2	16.4
8	144	29.2	62.5	8.3
9	154	24.0	63.0	13.0
10	146	21.9	68.5	9.6
11	149	23.3	62.0	14.7
12	174	17.8	67.8	14.4
13	159	18.2	67.3	14.5
14	176	17.6	69.9	12.5
15	168	17.9	72.6	9.5
16	187	21.9	71.7	6.4
17	201	23.4	68.7	8.0
18	153	24.8	66.0	9.2
19	78	24.4	67.9	7.7
20	44	11.4	70.5	18.2
21	36	22.2	72.2	5.6
22	29	13.8	75.9	10.3

**Table 3-2-2-21** Frequency of extracurricular physical exercise per week (male) (%)

Age group (year)	Subjects (n)	Never	At most once	1~2 times	3~4 times	5 times or more
6	104	37.5	18.3	41.3	2.9	0.0
7	201	39.8	19.4	32.3	7.5	1.0
8	172	30.8	20.3	35.5	10.5	2.9
9	202	29.2	23.3	36.6	7.9	3.0
10	173	28.3	20.8	36.4	10.4	4.0
11	148	27.7	13.5	41.9	10.8	6.1
12	196	34.2	15.3	31.6	14.8	4.1
13	185	31.9	13.0	34.6	11.4	9.2
14	162	29.6	18.5	35.8	9.3	6.8
15	188	25.5	13.8	36.7	16.5	7.4
16	162	28.4	13.6	33.3	16.0	8.6
17	186	21.0	17.7	41.4	15.1	4.8
18	143	28.7	13.3	35.7	16.8	5.6
19	102	28.4	19.6	35.3	13.7	2.9
20	96	20.8	27.1	40.6	8.3	3.1
21	95	31.6	10.5	47.4	6.3	4.2
22	87	36.8	24.1	24.1	14.9	0.0

**Table 3-2-2-22** Frequency of extracurricular physical exercise per week (female) (%)

Age group (year)	Subjects (n)	Never	At most once	1~2 times	3~4 times	5 times or more
6	94	40.4	18.1	33.0	7.4	1.1
7	159	34.0	19.5	39.0	7.5	0.0
8	146	37.0	14.4	39.7	8.2	0.7
9	155	31.0	21.3	34.8	9.7	3.2
10	147	33.3	17.0	35.4	10.9	3.4
11	150	24.0	23.3	39.3	9.3	4.0
12	175	33.1	17.1	32.6	9.1	8.0
13	159	44.7	13.2	22.6	11.9	7.5
14	176	41.5	14.2	31.8	8.0	4.5
15	169	39.1	20.1	26.6	7.7	6.5
16	186	49.5	19.4	22.6	7.0	1.6
17	203	48.8	20.7	27.1	1.5	2.0
18	186	45.7	26.3	23.7	3.8	0.5
19	128	52.3	19.5	21.9	5.5	0.8
20	99	48.5	26.3	20.2	4.0	1.0
21	100	51.0	19.0	24.0	5.0	1.0
22	93	46.2	21.5	31.2	1.1	0.0



**Table 3-2-2-23** Duration of each extracurricular physical exercise (male)(%)

Age group (year)	Participants	Within 30 mins	30 mins~1 hr	1~2 hrs	2 hrs or more
6	65	24.6	55.4	16.9	3.1
7	121	28.7	48.4	22.1	0.8
8	119	23.5	55.5	16.8	4.2
9	143	22.2	47.9	27.8	2.1
10	124	16.9	43.5	33.9	5.6
11	107	16.8	33.6	40.2	9.3
12	129	15.5	41.1	27.9	15.5
13	126	17.5	30.2	39.7	12.7
14	114	8.8	36.8	32.5	21.9
15	140	12.1	29.3	35.7	22.9
16	116	8.6	25.9	43.1	22.4
17	147	16.3	30.6	32.0	21.1
18	102	11.8	24.5	40.2	23.5
19	73	2.7	24.7	56.2	16.4
20	76	15.8	27.6	36.8	19.7
21	65	1.5	23.1	53.8	21.5
22	55	14.3	58.9	14.3	12.5

**Table 3-2-2-24** Duration of each extracurricular physical exercise (female)(%)

Age group (year)	Participants	Within 30 mins	30 mins~1 hr	1~2 hrs	2hrs or more
6	56	42.1	49.1	7.0	1.8
7	105	34.0	47.2	18.9	0.0
8	92	38.0	39.1	21.7	1.1
9	107	26.6	48.6	22.9	1.8
10	98	18.4	50.0	27.6	4.1
11	114	16.5	51.3	26.1	6.1
12	117	12.8	44.4	32.5	10.3
13	88	22.7	44.3	27.3	5.7
14	103	22.3	36.9	30.1	10.7
15	103	26.2	38.8	22.3	12.6
16	94	22.1	40.0	29.5	8.4
17	104	21.2	51.0	25.0	2.9
18	101	30.7	40.6	21.8	6.9
19	61	19.4	48.4	24.2	8.1
20	51	23.5	41.2	29.4	5.9
21	49	16.3	51.0	26.5	6.1
22	50	16.0	50.0	30.0	4.0

**Table 3-2-2-25** Self-perceived intensity of exercise (male) (%)

Age group (year)	Participants	Low	Moderate	High
6	65	23.1	52.3	24.6
7	121	21.3	53.3	25.4
8	119	16.8	57.1	26.1
9	143	18.6	58.6	22.8
10	124	23.4	60.5	16.1
11	107	16.8	61.7	21.5
12	129	15.5	60.5	24.0
13	126	19.0	61.1	19.8
14	113	11.5	61.9	26.5
15	140	15.0	55.0	30.0
16	116	6.9	53.4	39.7
17	147	8.8	51.7	39.5
18	102	11.8	35.3	52.9
19	73	11.0	49.3	39.7
20	77	5.2	39.0	55.8
21	65	3.1	43.1	53.8
22	55	5.4	48.2	46.4

**Table 3-2-2-26** Self-perceived intensity of exercise (female) (%)

Age group (year)	Participants	Low	Moderate	High
6	56	15.8	68.4	15.8
7	105	21.7	61.3	17.0
8	92	27.2	67.4	5.4
9	107	22.9	61.5	15.6
10	98	14.3	75.5	10.2
11	114	20.0	63.5	16.5
12	117	12.0	67.5	20.5
13	88	18.2	61.4	20.5
14	103	11.5	68.3	20.2
15	102	14.7	64.7	20.6
16	94	8.4	66.3	25.3
17	104	6.7	67.3	26.0
18	101	7.9	66.3	25.7
19	61	3.2	67.7	29.0
20	51	9.6	57.7	32.7
21	49	8.2	67.3	24.5
22	50	8.0	70.0	22.0

Table 3-2-2-27 Extracurricular sports activities (male) (%)

Age Group (year)	Participants	Swimming	Track & field	Ball games	Gymnastics	Skating	Dancing	Rope Skipping	Martial arts & Tae Kwon Do	Cycling	Judo	Karate	Yoga	Others
6	65	41.5	13.8	30.8	9.2	9.2	0.0	16.9	3.1	36.9	3.1	1.5	0.0	13.8
7	121	38.8	19.8	38.8	7.4	2.5	0.0	18.2	9.9	34.7	2.5	0.0	0.8	14.9
8	119	37.0	16.0	52.1	12.6	2.5	0.0	15.1	5.9	25.2	1.7	3.4	0.0	13.4
9	143	35.7	21.0	63.6	6.3	1.4	0.0	13.3	8.4	30.1	1.4	3.5	1.4	11.9
10	124	33.1	17.7	55.6	5.6	2.4	4.0	10.5	3.2	16.1	0.0	0.0	0.0	13.7
11	107	34.6	26.2	68.2	4.7	6.5	1.9	5.6	4.7	16.8	0.9	3.7	0.0	13.1
12	129	23.3	29.5	71.3	2.3	1.6	0.0	1.6	1.6	17.1	0.0	2.3	0.0	14.0
13	126	23.0	23.8	68.3	0.8	4.0	4.0	4.0	2.4	12.7	0.0	0.8	0.0	13.5
14	114	17.5	28.1	67.5	2.6	5.3	1.8	5.3	4.4	16.7	0.9	2.6	0.0	18.4
15	140	17.9	30.0	75.0	1.4	3.6	1.4	3.6	2.1	13.6	0.7	0.7	1.4	14.3
16	116	19.8	21.6	78.4	1.7	2.6	5.2	3.4	1.7	12.1	1.7	0.0	0.0	19.0
17	147	23.8	34.0	68.7	2.0	2.0	4.8	2.7	6.1	14.3	3.4	0.7	0.0	15.6
18	102	28.4	41.2	69.6	2.0	1.0	3.9	2.0	2.9	10.8	2.0	0.0	0.0	17.6
19	73	30.1	37.0	78.1	1.4	2.7	4.1	2.7	9.6	13.7	0.0	0.0	0.0	15.1
20	76	15.8	35.5	76.3	2.6	0.0	9.2	1.3	6.6	13.2	2.6	3.9	0.0	21.1
21	65	29.2	27.7	87.7	4.6	0.0	9.2	0.0	0.0	1.5	0.0	0.0	0.0	32.3
22	55	41.8	43.6	72.7	9.1	0.0	0.0	0.0	3.6	5.5	0.0	0.0	0.0	7.3

Table 3-2-2-28 Extracurricular sports activities (female) (%)

Age Group (year)	Participants	Swimming	Track & field	Ball games	Gymnastics	Skating	Dancing	Rope Skipping	Martial arts & Tae Kwon Do	Cycling	Judo	Karate	Yoga	Others
6	56	30.4	7.1	17.9	16.1	1.8	21.4	37.5	0.0	19.6	0.0	0.0	0.0	19.6
7	105	28.3	11.3	18.9	12.3	4.7	32.1	38.7	2.8	22.6	0.0	0.0	0.0	7.5
8	92	26.1	10.9	29.3	22.8	6.5	31.5	27.2	3.3	15.2	0.0	0.0	1.1	13.0
9	107	27.5	15.6	36.7	11.0	2.8	30.3	23.9	1.8	22.0	1.8	0.0	2.8	10.1
10	98	36.7	18.4	42.9	4.1	7.1	31.6	28.6	2.0	23.5	1.0	0.0	2.0	5.1
11	114	27.8	21.7	47.8	4.3	7.0	13.9	18.3	1.7	13.9	0.0	0.9	1.7	14.8
12	117	32.5	25.6	46.2	4.3	6.8	14.5	12.0	2.6	20.5	0.0	0.0	0.9	12.0
13	88	22.7	39.8	34.1	2.3	6.8	15.9	8.0	1.1	14.8	0.0	0.0	1.1	25.0
14	103	20.4	29.1	37.9	1.9	6.8	15.5	11.7	1.9	16.5	1.0	0.0	2.9	20.4
15	103	16.5	27.2	42.7	1.9	1.9	11.7	6.8	2.9	13.6	0.0	1.0	3.9	22.3
16	94	14.7	30.5	42.1	1.1	7.4	13.7	5.3	1.1	13.7	0.0	1.1	5.3	24.2
17	104	21.2	39.4	52.9	0.0	4.8	10.6	6.7	4.8	18.3	0.0	1.0	7.7	12.5
18	101	17.8	24.8	50.5	1.0	1.0	9.9	5.0	4.0	21.8	0.0	1.0	10.9	13.9
19	61	12.9	41.9	43.5	3.2	0.0	27.4	8.1	0.0	19.4	1.6	1.6	17.7	14.5
20	51	23.5	27.5	45.1	3.9	5.9	7.8	3.9	3.9	13.7	0.0	2.0	13.7	21.6
21	49	20.4	32.7	42.9	6.1	2.0	24.5	6.1	0.0	24.5	0.0	0.0	16.3	24.5
22	50	34.0	18.0	24.0	10.0	0.0	8.0	4.0	2.0	8.0	0.0	0.0	38.0	8.0

**Table 3-2-2-29** **Ball games frequently participated (male) (%)**

Age group (year)	Participants	Basketball	Volley ball	Foot-ball	Table tennis	Badminton	Tennis	Golf	Others
6	21	4.8	0.0	38.1	19.0	28.6	4.8	0.0	4.8
7	49	26.5	2.0	32.7	10.2	16.3	0.0	2.0	10.2
8	64	23.4	0.0	25.0	21.9	17.2	6.3	0.0	6.3
9	96	21.9	3.1	13.5	28.1	24.0	6.3	1.0	2.1
10	70	25.7	7.1	8.6	34.3	17.1	1.4	0.0	5.7
11	74	31.1	2.7	14.9	33.8	16.2	1.4	0.0	0.0
12	94	39.4	2.1	3.2	27.7	18.1	7.4	1.1	1.1
13	86	38.4	3.5	12.8	29.1	9.3	2.3	0.0	3.5
14	79	41.8	3.8	8.9	21.5	15.2	0.0	1.3	7.6
15	106	58.5	6.6	9.4	6.6	13.2	1.9	0.0	3.8
16	90	55.6	6.7	10.0	6.7	14.4	0.0	0.0	6.7
17	103	45.6	3.9	15.5	2.9	24.3	1.0	0.0	4.9
18	72	48.6	5.6	19.4	5.6	11.1	0.0	0.0	5.6
19	58	37.9	5.2	24.1	6.9	20.7	0.0	0.0	5.2
20	60	50.0	5.0	16.7	6.7	13.3	5.0	0.0	3.3
21	57	28.1	3.5	24.6	0.0	33.3	1.8	0.0	8.8
22	42	50.0	0.0	19.0	0.0	9.5	2.4	4.8	14.3

**Table 3-2-2-30** **Ball games frequently participated (female)(%)**

Age group (year)	Participants	Basketball	Volley ball	Foot-ball	Table tennis	Badminton	Tennis	Golf	Others
6	10	30.0	0.0	0.0	30.0	40.0	0.0	0.0	0.0
7	22	18.2	4.5	9.1	9.1	36.4	13.6	0.0	9.1
8	28	10.7	3.6	7.1	25.0	42.9	0.0	0.0	10.7
9	41	4.9	9.8	2.4	17.1	53.7	4.9	0.0	4.9
10	44	20.5	4.5	0.0	25.0	40.9	2.3	0.0	6.8
11	56	26.8	14.3	0.0	16.1	41.1	0.0	0.0	1.8
12	56	19.6	17.9	0.0	7.1	42.9	7.1	0.0	5.4
13	32	15.6	18.8	0.0	9.4	40.6	3.1	0.0	12.5
14	42	19.0	26.2	0.0	7.1	33.3	4.8	0.0	7.1
15	44	18.2	29.5	0.0	2.3	36.4	6.8	2.3	4.5
16	42	11.9	33.3	0.0	0.0	45.2	4.8	0.0	4.8
17	54	13.0	9.3	0.0	1.9	66.7	5.6	0.0	1.9
18	53	13.2	15.1	0.0	3.8	49.1	3.8	1.9	13.2
19	29	17.2	6.9	3.4	6.9	55.2	0.0	0.0	10.3
20	23	13.0	4.3	0.0	0.0	65.2	4.3	0.0	13.0
21	23	13.0	8.7	0.0	13.0	39.1	4.3	0.0	17.4
22	12	16.7	0.0	0.0	16.7	16.7	16.7	0.0	33.3

**Table 3-2-2-31 Occurrence of diseases in the past five years (male) (%)**

Age group (year)	Subjects (n)	Yes	No
6	104	11.5	88.5
7	201	15.4	84.6
8	172	14.5	85.5
9	202	13.9	86.1
10	173	11.0	89.0
11	149	14.1	85.9
12	196	12.2	87.8
13	185	11.4	88.6
14	162	17.9	82.1
15	188	13.8	86.2
16	162	12.3	87.7
17	186	12.9	87.1
18	143	11.2	88.8
19	102	13.7	86.3
20	96	21.9	78.1
21	95	11.6	88.4
22	87	9.2	90.8

**Table 3-2-2-32 Occurrence of diseases in the past five years (female) (%)**

Age group (year)	Subjects (n)	Yes	No
6	94	13.8	86.2
7	159	17.0	83.0
8	146	7.5	92.5
9	155	12.9	87.1
10	147	8.2	91.8
11	151	10.6	89.4
12	175	9.7	90.3
13	159	13.8	86.2
14	176	14.8	85.2
15	169	13.6	86.4
16	187	10.7	89.3
17	203	13.8	86.2
18	186	11.3	88.7
19	128	14.8	85.2
20	99	11.1	88.9
21	100	13.0	87.0
22	93	8.6	91.4

**Table 3-2-2-33 Diseases diagnosed in the past five years (male) (%)**

Age group (year)	Disease-stricken subjects	Chronic bronchitis	Pneumonia	Asthma	Accidental injury	Anemia	Hepatitis	Others
6	12	58.3	33.3	8.3	0.0	0.0	0.0	8.3
7	30	30.0	23.3	20.0	10.0	3.3	0.0	33.3
8	25	20.0	12.0	20.0	0.0	0.0	0.0	56.0
9	28	14.3	10.7	25.0	3.6	3.6	7.1	42.9
10	19	21.1	15.8	31.6	0.0	5.3	0.0	42.1
11	21	23.8	4.8	23.8	14.3	9.5	0.0	28.6
12	24	20.8	12.5	25.0	12.5	0.0	0.0	33.3
13	21	14.3	0.0	23.8	38.1	4.8	0.0	33.3
14	29	0.0	10.3	13.8	20.7	3.4	0.0	58.6
15	26	15.4	0.0	15.4	11.5	7.7	0.0	65.4
16	20	15.0	5.0	0.0	20.0	0.0	5.0	55.0
17	24	8.3	4.2	8.3	37.5	8.3	0.0	45.8
18	16	18.8	0.0	6.3	25.0	12.5	0.0	37.5
19	14	14.3	0.0	14.3	42.9	0.0	0.0	42.9
20	21	14.3	0.0	4.8	23.8	9.5	4.8	38.1
21	11	0.0	0.0	0.0	18.2	0.0	27.3	36.4
22	8	37.5	0.0	0.0	37.5	0.0	37.5	37.5

**Table 3-2-2-34 Diseases diagnosed in the past five years (female) (%)**

Age group (year)	Disease-Stricken subjects	Chronic bronchitis	Pneumonia	Asthma	Accidental injury	Anemia	Hepatitis	Others
6	13	38.5	23.1	0.0	7.7	0.0	7.7	30.8
7	27	33.3	40.7	11.1	0.0	7.4	0.0	33.3
8	11	45.5	63.6	0.0	0.0	0.0	0.0	9.1
9	20	20.0	25.0	10.0	5.0	0.0	0.0	55.0
10	12	25.0	25.0	16.7	0.0	8.3	0.0	25.0
11	16	12.5	18.8	6.3	12.5	6.3	6.3	31.3
12	17	11.8	0.0	17.6	0.0	0.0	0.0	70.6
13	22	18.2	9.1	4.5	13.6	9.1	0.0	59.1
14	26	23.1	7.7	7.7	3.8	11.5	0.0	53.8
15	23	13.0	13.0	21.7	4.3	13.0	0.0	52.2
16	20	0.0	5.0	5.0	25.0	20.0	0.0	50.0
17	27	18.5	7.4	3.7	22.2	7.4	0.0	44.4
18	21	9.5	4.8	9.5	14.3	19.0	0.0	33.3
19	19	26.3	5.3	5.3	10.5	26.3	5.3	36.8
20	11	9.1	9.1	0.0	36.4	27.3	0.0	27.3
21	13	7.7	0.0	7.7	30.8	38.5	0.0	7.7
22	8	0.0	0.0	0.0	0.0	25.0	0.0	50.0

2.3. Anthropometric Measurements

Table 3-2-3-1		Height (cm)										
Gender	Age group(year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>	
M	6	104	119.6	5.04	110.2	113.0	116.1	119.5	122.9	126.2	129.2	
	7	201	124.7	5.60	114.3	116.8	121.2	124.9	128.6	131.6	134.5	
	8	172	130.9	6.27	117.8	123.4	126.9	130.2	134.5	139.7	143.2	
	9	202	135.7	6.83	125.0	127.5	131.0	135.4	139.5	143.6	150.6	
	10	173	140.2	6.23	129.0	132.5	136.4	140.2	144.1	147.7	153.1	
	11	149	146.8	7.45	134.2	137.8	140.9	146.3	152.3	156.6	160.7	
	12	196	154.9	8.41	138.0	143.3	149.0	155.2	160.7	165.3	170.5	
	13	185	161.5	7.50	145.1	149.5	157.3	161.7	167.0	170.6	173.8	
	14	162	166.0	6.06	152.6	157.9	162.2	166.4	169.9	173.7	176.6	
	15	188	168.8	6.72	155.5	161.0	164.1	168.8	173.1	177.1	181.5	
	16	162	170.5	6.30	158.5	162.6	166.5	170.8	174.6	177.9	182.2	
	17	186	171.9	5.50	161.6	165.7	168.2	171.7	175.4	178.5	183.6	
	18	143	172.0	5.90	162.8	164.2	167.3	171.3	176.4	180.0	182.8	
	19	102	171.2	6.31	158.9	163.6	167.0	170.5	175.6	180.0	184.5	
	20	96	172.1	6.17	160.7	164.0	168.1	171.4	176.7	180.8	183.6	
	21	95	172.5	5.27	161.7	165.8	168.8	172.3	176.8	179.0	183.2	
	22	87	172.2	7.79	161.1	162.7	167.3	170.8	175.4	184.2	190.2	
	F	6	94	119.3	4.70	110.5	113.6	116.1	118.8	123.0	125.7	129.4
		7	159	123.5	6.07	111.3	115.7	119.2	123.5	127.6	131.2	136.1
		8	146	129.9	6.40	118.7	121.6	125.1	129.8	134.0	139.3	142.0
		9	155	136.6	6.00	125.2	128.2	132.2	136.5	141.0	144.7	147.3
		10	147	142.9	7.18	128.2	133.4	136.9	143.2	148.5	152.1	154.2
11		151	148.8	7.43	132.3	137.2	144.2	150.1	154.0	157.5	160.7	
12		175	153.8	6.21	140.9	145.5	149.6	154.7	157.8	161.6	165.1	
13		159	156.3	5.60	146.9	149.7	152.8	156.2	159.5	163.4	169.3	
14		176	157.8	5.13	146.8	151.4	154.7	158.0	161.1	163.9	167.3	
15		169	159.2	5.21	149.4	152.2	155.6	159.1	162.8	165.2	169.0	
16		187	159.4	5.95	147.0	151.3	155.6	159.6	163.6	166.6	171.5	
17		203	159.7	4.92	149.8	152.9	156.1	159.8	162.7	165.2	170.1	
18		186	158.9	5.59	147.4	151.3	155.2	158.9	162.8	166.2	169.6	
19		128	158.9	6.10	146.9	152.1	154.1	158.5	163.3	166.4	169.5	
20		99	159.1	5.13	149.2	152.5	155.5	159.2	162.7	165.2	168.6	
21		100	159.2	5.25	149.2	152.1	155.6	159.5	162.1	166.3	170.7	
22		93	157.8	4.75	148.6	150.9	154.5	157.5	162.0	163.4	166.7	



Table 3-2-3-2 Sitting height (cm)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	6	104	65.6	2.73	60.4	62.0	63.6	65.9	67.0	69.5	71.4
	7	201	67.9	3.04	62.2	63.6	65.7	67.8	69.9	72.0	73.9
	8	172	70.7	3.17	64.5	66.8	68.5	70.5	72.8	74.9	76.6
	9	202	72.1	3.10	66.2	68.1	70.1	72.1	73.9	76.2	78.3
	10	173	73.9	3.15	68.1	70.0	72.1	73.8	75.9	77.9	80.5
	11	149	77.0	4.05	69.9	72.2	74.2	76.9	79.8	82.3	84.4
	12	196	80.7	4.64	71.3	74.6	77.7	81.0	83.9	86.5	89.6
	13	184	84.2	4.35	75.5	77.9	81.5	84.6	87.8	90.2	91.2
	14	162	87.2	3.71	78.9	82.5	85.0	87.6	89.7	91.5	93.5
	15	187	89.2	3.75	81.9	84.6	86.8	89.2	92.0	94.2	96.1
	16	162	90.1	3.86	82.9	85.6	87.4	90.2	93.0	94.5	96.6
	17	186	91.3	3.18	85.4	87.6	89.1	91.2	93.2	95.5	97.8
	18	143	91.2	4.14	85.5	86.9	89.3	91.4	93.7	95.7	97.3
	19	102	91.5	3.31	84.9	87.4	88.7	91.8	93.8	95.5	98.4
	20	96	92.2	3.00	86.2	87.9	90.3	92.1	94.7	95.7	97.2
	21	95	91.7	2.66	86.9	88.9	90.0	91.3	93.4	95.5	97.4
	22	87	92.1	3.80	85.8	87.1	89.0	91.8	94.2	97.6	99.8
F	6	94	65.2	2.56	59.7	61.8	63.8	65.2	66.4	68.5	71.1
	7	158	66.9	3.18	60.2	63.2	64.7	66.7	69.0	71.7	72.9
	8	146	69.5	3.33	64.1	65.8	67.1	69.0	71.7	74.3	76.1
	9	155	72.7	3.11	67.2	68.8	70.6	72.3	75.0	76.8	78.9
	10	147	75.5	3.79	69.2	70.5	72.6	75.5	78.1	80.5	84.2
	11	151	78.7	4.22	69.9	73.1	76.5	78.8	81.0	84.3	87.5
	12	175	81.6	3.82	73.5	77.0	79.1	81.8	84.4	86.1	88.6
	13	159	82.9	3.03	76.8	79.6	81.0	82.9	84.8	86.6	88.9
	14	176	84.1	2.88	79.1	80.6	82.3	84.1	85.9	87.8	89.6
	15	169	85.0	2.80	79.8	81.5	83.4	85.1	86.7	89.0	90.0
	16	186	85.4	2.96	80.2	81.4	83.4	85.5	87.4	89.1	91.1
	17	203	85.6	2.73	80.1	82.0	84.0	85.6	87.2	89.3	90.9
	18	186	85.7	3.01	79.9	82.0	83.7	85.8	87.6	89.5	91.0
	19	128	85.6	2.98	80.0	81.8	83.6	85.5	87.8	89.6	91.4
	20	99	85.8	2.63	80.7	81.7	84.1	85.7	87.7	89.6	90.5
	21	100	86.0	2.86	80.0	82.6	84.2	85.8	88.0	89.9	91.4
	22	93	85.2	2.34	80.1	82.0	83.2	85.3	86.8	88.3	89.1

Table 3-2-3-3 Foot length (cm)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>	
M	6	104	18.7	1.05	17.2	17.5	18.1	18.6	19.5	20.1	20.7	
	7	201	19.4	1.01	17.7	18.1	18.7	19.4	20.1	20.7	21.3	
	8	172	20.3	1.20	18.2	18.6	19.5	20.3	21.1	21.9	22.9	
	9	202	21.1	1.16	19.2	19.6	20.3	21.0	22.0	22.7	23.4	
	10	173	21.8	1.18	19.8	20.4	21.1	21.7	22.5	23.3	24.4	
	11	149	22.8	1.45	20.1	20.8	21.9	23.0	23.8	24.6	25.8	
	12	196	23.9	1.35	21.3	22.1	23.0	23.9	24.8	25.6	26.6	
	13	185	24.6	1.27	22.1	22.9	23.9	24.7	25.4	26.2	26.9	
	14	162	25.1	1.17	23.1	23.5	24.2	25.1	25.9	26.5	27.6	
	15	188	25.2	1.21	22.6	23.7	24.4	25.3	26.0	26.7	27.2	
	16	162	25.3	1.16	23.2	23.8	24.4	25.5	26.1	26.8	27.3	
	17	186	25.4	1.10	23.3	24.0	24.7	25.3	26.1	26.7	27.8	
	18	143	25.5	1.16	23.3	24.0	24.6	25.4	26.2	27.0	28.1	
	19	102	25.2	1.10	23.0	23.8	24.5	25.2	26.0	26.7	27.3	
	20	96	25.3	1.21	22.8	23.8	24.4	25.3	26.1	26.9	27.6	
	21	95	25.3	1.08	23.5	23.7	24.6	25.4	26.0	26.7	27.5	
	22	87	25.3	1.29	22.9	23.5	24.3	25.4	26.1	27.0	27.9	
	F	6	94	18.2	1.04	16.6	17.0	17.4	18.0	19.1	19.6	20.2
		7	159	18.9	1.11	16.9	17.6	18.2	18.9	19.7	20.4	21.2
		8	146	19.9	1.12	17.9	18.6	19.0	19.7	20.5	21.5	22.5
		9	155	20.8	1.17	18.5	19.2	20.0	20.8	21.6	22.2	23.2
		10	147	21.6	1.17	19.2	20.1	20.8	21.7	22.4	22.9	23.6
11		151	22.2	1.23	19.5	20.4	21.4	22.3	23.0	23.5	24.4	
12		175	22.5	1.11	20.3	21.2	21.9	22.6	23.3	24.0	24.6	
13		159	22.7	1.10	20.7	21.4	21.9	22.5	23.4	24.1	24.8	
14		176	22.7	1.05	20.6	21.4	22.0	22.7	23.4	24.2	24.8	
15		169	22.9	1.01	20.8	21.6	22.3	22.8	23.4	24.1	25.1	
16		187	22.8	1.11	20.7	21.5	22.0	22.8	23.6	24.2	24.9	
17		203	22.9	0.95	21.1	21.6	22.2	22.9	23.6	24.1	24.9	
18		186	22.8	1.11	20.6	21.2	22.1	22.8	23.4	24.1	25.0	
19		128	22.6	1.10	20.4	21.1	21.8	22.5	23.3	24.1	24.8	
20		99	22.5	1.02	20.4	21.2	21.9	22.4	23.2	24.0	24.2	
21		100	22.6	0.97	20.2	21.5	22.0	22.6	23.2	24.0	24.5	
22		93	22.5	0.90	21.0	21.3	22.0	22.4	22.9	23.9	24.3	

Table 3-2-3-4 Weight (kg)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>	
M	6	104	22.9	4.82	16.8	18.2	19.5	21.3	25.1	32.0	34.6	
	7	201	25.2	5.41	18.3	19.7	21.8	24.1	27.4	32.3	36.6	
	8	172	30.2	8.43	20.4	22.2	24.2	28.0	33.9	39.3	56.1	
	9	202	32.0	8.41	21.6	23.8	25.4	29.6	36.0	44.4	52.2	
	10	173	35.2	8.75	23.9	26.1	29.0	33.1	39.1	48.4	57.3	
	11	149	40.5	10.42	26.3	29.0	32.4	39.0	46.1	57.0	64.3	
	12	196	46.6	12.86	29.3	33.3	37.5	44.2	53.1	65.2	79.1	
	13	185	51.2	11.72	31.9	36.7	43.4	49.7	57.9	67.4	79.4	
	14	162	55.3	11.88	35.1	42.2	47.1	53.0	63.2	72.1	82.3	
	15	188	56.8	10.95	41.5	45.6	49.1	54.3	62.3	73.0	83.8	
	16	162	59.1	11.65	42.8	47.6	50.9	57.2	64.0	72.2	89.8	
	17	186	60.8	9.86	45.6	49.2	53.2	59.8	66.0	75.1	83.6	
	18	143	62.0	11.13	46.6	49.2	53.6	60.6	66.6	77.8	89.1	
	19	102	60.9	9.23	47.2	50.0	54.8	59.8	64.7	71.4	86.9	
	20	96	63.3	10.97	49.8	52.5	56.0	60.8	69.1	75.7	88.5	
	21	95	64.7	9.31	48.5	52.5	59.2	62.8	71.4	77.8	83.6	
	22	87	66.3	9.21	51.5	54.3	59.4	66.3	70.8	78.5	87.4	
	F	6	94	22.0	3.82	16.3	17.5	19.2	21.3	24.3	26.8	31.3
		7	159	24.4	4.84	18.2	19.4	20.7	23.4	27.1	31.1	36.7
		8	146	27.9	6.98	19.7	20.9	23.0	26.0	30.3	37.6	45.8
		9	155	32.0	7.05	22.0	24.1	26.5	30.9	36.5	41.9	48.0
		10	147	36.6	8.88	23.9	26.5	29.8	34.1	42.6	50.2	55.1
11		151	40.3	8.88	24.1	29.5	34.0	39.0	45.4	50.4	61.0	
12		175	45.6	9.60	31.0	34.6	39.6	44.2	49.7	58.9	70.2	
13		159	47.9	9.35	34.7	39.3	42.2	46.3	51.0	59.9	68.9	
14		176	50.2	8.83	38.5	41.5	44.4	48.3	54.8	60.8	70.6	
15		168	52.1	9.50	39.3	41.8	45.9	50.5	56.6	64.1	76.4	
16		187	51.8	8.24	40.2	42.8	45.6	50.4	56.4	62.0	68.2	
17		202	52.6	9.38	40.3	44.8	47.3	50.7	56.5	61.6	73.8	
18		186	51.6	8.74	40.2	42.3	46.1	50.4	54.9	62.8	76.0	
19		128	51.5	7.90	40.7	43.4	46.4	50.6	54.4	60.9	75.0	
20		99	51.8	8.39	38.7	43.0	46.4	50.2	56.0	61.7	78.9	
21		100	50.8	6.70	40.8	43.4	46.5	50.5	54.2	59.6	65.9	
22		93	50.2	7.74	39.3	41.4	44.6	49.5	54.0	60.1	70.4	

Table 3-2-3-5 BMI

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	6	104	15.9	2.53	13.0	13.7	14.1	15.1	17.0	20.7	22.2
	7	201	16.1	2.96	13.0	13.8	14.4	15.4	16.9	19.3	21.8
	8	172	17.4	3.65	12.9	14.0	14.6	16.4	19.3	22.2	27.0
	9	202	17.2	3.35	13.1	13.8	14.8	16.3	18.7	22.5	25.0
	10	173	17.7	3.42	13.2	14.1	15.2	16.9	19.9	22.6	25.6
	11	149	18.6	3.67	13.8	14.4	15.9	17.6	20.6	24.4	27.0
	12	196	19.2	3.91	14.2	15.3	16.2	18.2	21.3	24.3	29.8
	13	185	19.5	3.58	14.6	15.8	16.8	18.8	21.7	24.6	27.7
	14	162	20.0	4.02	14.8	16.0	17.1	18.9	22.7	25.5	30.1
	15	188	19.9	3.14	16.0	16.5	17.7	19.2	21.1	24.6	28.1
	16	162	20.3	3.63	15.5	16.5	18.0	19.5	21.5	24.6	31.9
	17	186	20.5	3.07	15.8	17.2	18.2	19.9	22.6	24.8	27.4
	18	143	20.9	3.44	16.2	17.2	18.6	20.4	22.6	25.8	28.8
	19	102	20.8	3.01	16.3	17.2	18.7	20.2	22.4	25.3	28.5
	20	96	21.3	3.21	17.4	18.1	19.0	20.6	22.7	25.4	29.3
	21	95	21.8	3.11	16.1	17.9	19.7	21.5	23.4	26.2	27.3
	22	87	22.3	2.76	15.9	18.7	20.1	22.7	24.2	25.5	28.0
F	6	94	15.3	1.94	12.5	13.2	13.7	15.0	16.5	18.1	20.2
	7	159	15.9	2.23	13.2	13.8	14.3	15.3	16.9	19.2	21.1
	8	146	16.4	2.92	12.6	13.4	14.4	15.6	17.6	20.4	24.2
	9	155	17.0	3.03	12.9	13.8	14.8	16.3	18.8	21.4	25.0
	10	147	17.7	3.32	13.4	14.1	15.1	16.9	19.7	23.1	25.1
	11	151	18.1	3.11	13.6	14.9	15.8	17.3	19.6	23.2	25.7
	12	175	19.2	3.31	14.6	15.8	16.9	18.5	21.0	23.1	26.6
	13	159	19.6	3.31	15.3	16.3	17.4	18.9	20.9	24.2	27.4
	14	176	20.1	3.22	15.6	16.5	18.1	19.7	21.6	23.9	26.4
	15	168	20.6	3.41	16.1	16.6	18.1	20.1	22.2	25.3	28.9
	16	187	20.4	3.12	16.4	17.2	18.2	19.8	21.8	24.7	28.2
	17	202	20.6	3.41	16.1	17.3	18.6	20.2	21.9	24.1	29.6
	18	186	20.4	3.05	16.2	17.8	18.5	20.0	21.6	24.2	28.9
	19	128	20.4	2.72	16.5	17.7	18.7	20.1	21.5	23.4	29.1
	20	99	20.5	3.14	15.9	17.1	18.6	19.9	22.0	23.1	30.3
	21	100	20.1	2.45	15.7	16.7	18.7	20.0	21.3	22.8	26.4
	22	93	20.1	2.86	16.1	17.2	18.2	19.3	21.4	24.1	28.3

Table 3-2-3-6 Weight status (%)

Gender	Age group (year)	n	Underweight	Slightly underweight	Normal	Slightly overweight	Overweight	
M	6	104	2.9	49.0	27.9	2.9	17.3	
	7	201	4.0	39.3	38.3	6.0	12.4	
	8	172	6.4	29.1	33.1	6.4	25.0	
	9	202	9.9	32.7	32.7	5.4	19.3	
	10	173	8.7	33.5	30.6	5.2	22.0	
	11	149	5.4	42.3	32.2	5.4	14.8	
	12	196	9.7	41.8	24.0	6.1	18.4	
	13	185	18.9	50.3	15.7	4.3	10.8	
	14	162	21.0	45.7	13.6	5.6	14.2	
	15	188	15.4	53.2	18.1	1.6	11.7	
	16	162	15.4	47.5	24.1	1.9	11.1	
	17	186	9.1	48.9	24.2	6.5	11.3	
	18	143	16.1	30.8	32.9	5.6	14.7	
	19	102	15.7	34.3	31.4	4.9	13.7	
	20	96	5.2	38.5	32.3	4.2	19.8	
	21	95	10.5	17.9	42.1	6.3	23.2	
	22	87	4.6	17.2	34.5	10.3	33.3	
		<b>Total</b>	<b>2603</b>	<b>10.8</b>	<b>39.6</b>	<b>27.9</b>	<b>5.1</b>	<b>16.5</b>
	F	6	94	4.3	43.6	31.9	8.5	11.7
		7	159	1.9	37.7	39.6	6.3	14.5
		8	146	5.5	34.9	36.3	5.5	17.8
		9	155	8.4	39.4	31.6	4.5	16.1
10		147	5.4	34.7	35.4	6.8	17.7	
11		151	3.3	28.5	49.7	4.0	14.6	
12		175	6.3	41.7	30.3	10.3	11.4	
13		159	2.5	39.6	40.9	5.0	11.9	
14		176	1.7	26.7	47.2	7.4	17.0	
15		168	8.9	38.1	35.7	4.8	12.5	
16		187	4.8	43.9	38.0	2.7	10.7	
17		202	10.9	41.1	37.1	3.5	7.4	
18		186	8.6	46.2	35.5	3.8	5.9	
19		128	8.6	45.3	39.1	2.3	4.7	
20		99	11.1	45.5	34.3	1.0	8.1	
21		100	13.0	48.0	34.0	2.0	3.0	
22		93	16.1	48.4	25.8	2.2	7.5	
		<b>Total</b>	<b>2525</b>	<b>6.8</b>	<b>39.6</b>	<b>37.1</b>	<b>4.9</b>	<b>11.6</b>

Table 3-2-3-7 Chest circumference (cm)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	6	104	58.4	5.37	51.1	53.2	54.9	56.9	60.3	67.9	71.7
	7	201	59.8	5.02	52.8	54.8	56.5	58.7	62.1	67.2	72.3
	8	172	64.4	7.97	55.0	56.5	58.5	62.5	68.5	74.0	86.8
	9	202	65.3	7.78	53.8	57.5	59.9	63.3	68.4	76.4	83.7
	10	173	67.4	8.02	57.5	59.6	61.4	65.1	72.3	79.1	86.4
	11	149	71.0	9.34	59.0	61.1	63.3	69.5	76.8	84.8	92.4
	12	196	74.9	9.26	62.5	64.8	68.3	72.6	80.5	87.8	98.1
	13	184	77.7	8.60	63.0	67.7	72.0	77.0	82.6	88.3	97.3
	14	162	80.9	8.61	67.2	71.8	75.1	79.5	85.5	93.0	102.6
	15	188	81.6	7.33	71.6	73.4	76.4	80.2	85.6	91.8	97.3
	16	162	83.0	7.84	71.7	74.0	77.6	82.1	87.4	92.6	103.5
	17	186	84.9	6.63	74.5	77.1	80.5	83.9	88.2	95.0	98.9
	18	143	86.2	7.65	74.8	78.0	81.0	84.5	89.0	96.8	102.8
	19	102	85.8	7.05	76.8	78.2	81.2	85.3	87.8	94.3	105.5
20	96	87.8	6.57	77.9	80.4	83.3	86.6	91.7	95.3	103.4	
21	95	88.2	6.33	74.4	80.4	83.8	87.4	93.4	96.2	99.4	
22	87	89.6	6.19	77.6	79.8	86.2	89.9	93.5	98.5	100.7	
F	6	94	56.2	4.76	49.9	51.3	52.8	54.9	58.2	62.7	68.5
	7	159	58.4	5.24	51.6	52.9	54.8	57.4	60.2	65.8	70.8
	8	146	61.5	6.95	52.9	54.4	56.8	59.7	64.7	72.5	79.3
	9	155	64.8	7.08	55.3	56.8	59.3	63.5	68.5	74.8	81.7
	10	146	68.4	7.89	57.0	59.0	62.1	66.8	73.3	81.5	84.8
	11	151	70.9	7.15	59.8	62.6	65.3	70.3	74.1	80.0	86.7
	12	174	74.4	7.18	62.6	66.7	70.0	73.1	77.7	84.2	89.5
	13	159	75.8	6.24	66.9	70.0	71.8	74.5	78.1	83.9	91.1
	14	176	78.1	6.39	69.0	71.4	73.9	76.9	81.7	85.6	93.4
	15	169	79.4	6.28	70.8	72.8	75.2	78.0	82.1	88.4	95.4
	16	187	79.5	5.96	71.4	72.7	75.4	78.1	83.0	87.3	92.7
	17	203	79.9	5.98	71.4	74.0	76.3	78.8	82.3	86.3	93.3
	18	186	79.8	5.95	71.3	73.3	75.9	78.9	82.1	86.2	95.6
	19	128	80.6	5.58	71.7	74.5	77.1	80.1	83.1	86.5	96.7
20	98	80.2	5.08	72.5	75.0	76.6	79.7	82.4	86.3	95.2	
21	100	80.0	4.61	73.2	75.0	76.7	79.5	82.5	86.8	91.4	
22	93	79.8	5.24	73.1	74.0	76.2	78.8	82.4	87.3	94.8	

Table 3-2-3-8 Waist circumference (cm)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>	
M	6	104	54.3	7.13	47.3	48.2	49.7	51.5	56.6	67.3	73.8	
	7	201	56.1	6.71	47.5	49.3	51.7	54.4	58.8	65.7	73.0	
	8	172	60.7	10.38	48.2	50.9	52.9	57.5	67.2	73.2	90.2	
	9	202	61.8	9.47	50.1	52.4	55.0	59.5	66.4	75.9	84.5	
	10	173	64.4	10.19	50.8	53.4	57.0	61.5	72.0	78.8	88.3	
	11	149	66.8	10.85	51.3	55.2	58.0	64.2	73.4	83.0	91.0	
	12	196	69.4	11.53	55.6	58.1	60.1	66.5	76.2	86.9	98.3	
	13	185	70.0	10.64	56.3	59.0	63.0	66.9	76.0	86.0	95.0	
	14	162	71.9	11.42	57.7	61.0	63.7	67.7	79.0	89.6	100.4	
	15	188	71.1	9.20	59.9	61.5	64.6	68.9	75.5	84.8	93.5	
	16	162	72.9	9.71	59.9	62.7	66.5	70.7	76.2	84.2	101.7	
	17	186	73.8	8.68	62.0	64.1	67.3	71.8	78.9	84.7	95.9	
	18	143	75.1	9.58	63.1	65.5	69.1	73.1	78.8	89.5	98.8	
	19	102	74.1	8.57	61.2	65.4	68.0	72.3	78.4	83.9	98.3	
	20	96	76.3	8.73	65.5	67.9	70.2	73.8	80.2	87.5	97.7	
	21	95	77.0	7.66	65.2	68.5	72.1	75.0	82.5	89.2	92.0	
	22	87	80.0	7.69	64.4	68.7	74.3	81.3	86.2	89.2	93.1	
	F	6	94	52.4	5.22	45.5	46.5	48.6	51.7	54.9	59.5	65.4
		7	159	54.3	6.49	46.4	48.0	49.5	52.8	56.5	62.8	71.5
		8	146	56.5	7.91	45.9	48.8	51.0	54.4	59.8	67.2	80.3
		9	155	59.7	8.22	49.1	51.2	53.5	57.2	65.5	70.9	81.3
		10	147	62.3	9.23	49.2	52.0	55.6	59.5	67.5	76.4	82.5
11		151	63.2	7.85	51.2	54.5	57.6	62.0	67.4	73.4	82.8	
12		175	66.3	8.78	54.9	58.1	60.6	63.8	70.0	78.8	87.7	
13		158	66.8	7.89	56.6	58.9	61.9	65.3	69.6	78.5	87.3	
14		176	68.7	8.21	57.7	60.8	63.2	67.8	71.5	79.2	85.7	
15		169	69.6	7.80	59.4	61.7	64.0	67.6	73.7	79.4	90.7	
16		187	70.1	7.39	60.8	62.1	65.0	68.5	73.4	81.0	87.8	
17		203	70.1	8.17	59.8	61.7	64.9	68.5	73.5	79.9	89.5	
18		186	69.7	7.74	58.5	61.6	64.5	68.7	73.0	78.7	91.1	
19		128	69.6	7.12	59.3	62.7	65.3	68.5	72.5	76.6	92.8	
20		98	70.2	7.38	57.9	62.2	65.0	69.3	74.0	80.2	86.8	
21		100	69.9	6.63	60.8	62.4	64.9	68.4	73.5	78.5	84.7	
22		93	69.9	7.26	60.2	61.9	64.7	68.1	74.6	82.3	86.6	

Table 3-2-3-9 Hip circumference (cm)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>	
M	6	104	61.2	6.38	51.6	54.2	56.5	59.9	65.1	71.6	75.8	
	7	201	64.1	5.82	54.5	57.3	60.1	63.0	67.6	72.0	75.8	
	8	172	69.7	8.17	58.4	60.5	63.3	68.6	74.7	79.5	91.1	
	9	202	71.2	8.09	60.3	62.0	65.0	69.9	75.5	83.0	89.4	
	10	173	74.0	7.80	62.3	65.0	68.1	73.0	78.0	85.7	89.3	
	11	149	77.6	8.71	64.0	67.3	70.9	76.4	83.0	90.1	96.0	
	12	196	81.8	9.68	66.5	71.0	74.6	80.0	88.0	95.3	104.5	
	13	183	84.0	8.39	68.8	74.1	78.2	83.4	88.7	95.9	101.5	
	14	162	87.1	8.25	71.1	77.5	81.2	85.5	92.0	98.4	105.0	
	15	188	87.7	7.04	77.4	80.3	82.5	86.6	91.7	97.3	105.0	
	16	162	89.3	7.71	78.0	80.4	84.5	87.9	93.1	99.2	109.1	
	17	186	91.1	9.96	80.2	82.8	85.4	89.4	95.5	100.2	106.2	
	18	142	91.2	10.79	81.0	82.4	85.3	90.0	94.1	100.6	105.5	
	19	102	90.0	6.09	80.8	82.2	85.5	89.3	93.6	98.5	104.4	
	20	96	90.4	7.27	78.9	83.4	86.5	89.4	94.1	100.1	106.8	
	21	95	91.3	5.71	79.0	83.5	88.0	90.8	94.8	98.8	102.6	
	22	87	92.8	5.50	83.5	86.2	88.7	92.0	97.3	101.0	103.1	
	F	6	94	61.5	5.00	53.5	55.0	58.0	60.8	65.2	67.6	73.6
		7	159	63.9	5.67	55.4	57.5	60.0	62.8	67.0	71.6	77.2
		8	146	66.8	7.07	56.8	59.3	61.8	65.4	70.9	77.1	84.4
		9	155	70.8	6.88	60.2	62.7	65.5	69.9	75.4	80.8	85.8
		10	147	75.0	8.09	61.8	64.5	69.0	73.6	81.7	87.0	89.5
11		151	78.4	7.90	63.0	68.3	72.7	78.4	83.5	88.4	95.9	
12		175	83.2	7.60	68.9	74.3	78.5	82.3	87.7	92.7	99.9	
13		159	85.4	6.81	72.9	78.5	81.0	84.4	88.4	96.0	100.6	
14		176	87.3	6.15	78.0	80.5	83.5	86.7	90.7	95.1	100.2	
15		169	89.2	6.67	79.4	81.2	84.6	88.6	92.2	97.5	104.6	
16		187	89.3	5.71	81.2	82.6	85.1	88.6	92.4	96.1	102.1	
17		203	90.0	6.50	81.2	83.0	86.0	89.1	92.9	97.7	106.1	
18		186	89.1	6.42	80.4	82.0	85.6	88.3	92.3	95.8	104.4	
19		128	89.0	5.72	79.8	82.0	85.6	88.7	91.5	95.9	103.6	
20		98	89.8	6.42	78.5	82.5	86.3	89.4	93.5	96.0	107.4	
21		100	89.7	5.63	81.4	83.9	85.9	88.8	92.5	97.5	101.0	
22		93	88.5	5.12	80.6	82.8	84.7	88.2	91.2	95.3	99.7	



Table 3-2-3-10 Waist to Hip Ratio (WHR)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>	
M	6	104	0.888	0.573	0.805	0.828	0.850	0.880	0.914	0.959	1.040	
	7	201	0.874	0.585	0.786	0.810	0.838	0.865	0.904	0.939	1.016	
	8	172	0.868	0.620	0.780	0.798	0.820	0.856	0.907	0.959	1.005	
	9	202	0.866	0.559	0.774	0.798	0.824	0.861	0.902	0.947	0.975	
	10	173	0.868	0.663	0.760	0.796	0.819	0.859	0.911	0.965	0.996	
	11	149	0.858	0.655	0.750	0.779	0.807	0.848	0.897	0.951	0.995	
	12	196	0.845	0.614	0.744	0.770	0.801	0.838	0.886	0.932	0.981	
	13	183	0.832	0.642	0.732	0.755	0.788	0.818	0.878	0.931	0.964	
	14	162	0.822	0.688	0.730	0.753	0.775	0.809	0.853	0.931	1.000	
	15	188	0.809	0.562	0.722	0.747	0.769	0.799	0.839	0.885	0.949	
	16	162	0.814	0.579	0.733	0.755	0.775	0.803	0.843	0.906	0.939	
	17	186	0.811	0.608	0.727	0.754	0.772	0.808	0.840	0.887	0.912	
	18	142	0.825	0.698	0.738	0.769	0.789	0.814	0.855	0.924	0.960	
	19	102	0.821	0.549	0.734	0.757	0.781	0.816	0.856	0.888	0.941	
	20	96	0.843	0.580	0.758	0.777	0.805	0.831	0.867	0.934	0.983	
	21	95	0.843	0.528	0.772	0.785	0.803	0.833	0.881	0.918	0.946	
	22	87	0.862	0.581	0.741	0.767	0.822	0.865	0.903	0.939	0.964	
	F	6	94	0.853	0.383	0.769	0.803	0.829	0.851	0.879	0.906	0.924
		7	159	0.848	0.512	0.773	0.792	0.822	0.846	0.874	0.899	0.942
		8	146	0.844	0.456	0.770	0.791	0.817	0.833	0.869	0.908	0.944
		9	155	0.841	0.529	0.764	0.785	0.805	0.828	0.870	0.905	0.973
		10	147	0.828	0.553	0.738	0.766	0.796	0.823	0.861	0.909	0.947
11		151	0.805	0.477	0.727	0.746	0.768	0.805	0.837	0.865	0.903	
12		175	0.795	0.540	0.704	0.735	0.760	0.785	0.825	0.877	0.915	
13		158	0.780	0.442	0.711	0.728	0.753	0.775	0.807	0.841	0.895	
14		176	0.786	0.478	0.697	0.735	0.756	0.781	0.808	0.849	0.892	
15		169	0.779	0.462	0.716	0.727	0.746	0.772	0.803	0.842	0.898	
16		187	0.784	0.467	0.708	0.725	0.750	0.778	0.815	0.850	0.889	
17		203	0.777	0.515	0.692	0.716	0.745	0.768	0.800	0.844	0.908	
18		186	0.781	0.545	0.694	0.717	0.746	0.777	0.808	0.840	0.928	
19		128	0.782	0.498	0.694	0.733	0.749	0.779	0.808	0.850	0.904	
20		98	0.781	0.473	0.702	0.715	0.754	0.779	0.807	0.834	0.912	
21		100	0.780	0.488	0.692	0.728	0.747	0.777	0.807	0.841	0.880	
22		93	0.789	0.506	0.703	0.727	0.751	0.788	0.812	0.859	0.928	

Table 3-2-3-11 Shoulder width (cm)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>	
M	6	104	25.7	1.35	23.3	24.0	24.8	25.6	26.5	27.6	28.6	
	7	201	26.4	1.54	23.6	24.4	25.3	26.5	27.4	28.3	29.5	
	8	172	27.6	1.76	24.7	25.4	26.4	27.4	28.7	30.1	31.0	
	9	202	28.4	1.91	24.9	26.2	27.2	28.5	29.5	30.9	32.3	
	10	173	29.6	1.77	26.2	27.5	28.4	29.5	30.9	31.8	33.0	
	11	149	31.1	2.10	27.1	28.3	29.5	31.1	32.5	33.9	35.3	
	12	196	33.0	2.29	28.7	29.8	31.5	33.0	34.5	35.7	37.6	
	13	185	34.5	2.49	28.9	31.0	33.2	34.9	36.2	37.5	38.5	
	14	162	35.7	2.01	31.5	33.0	34.6	36.0	37.1	38.2	38.9	
	15	188	36.6	2.45	31.7	34.0	35.3	36.6	38.2	39.6	40.3	
	16	162	37.1	2.56	31.0	33.9	36.0	37.4	38.8	40.0	41.0	
	17	186	37.5	2.09	33.0	34.8	36.2	37.7	38.9	40.3	41.5	
	18	143	38.2	1.85	34.3	36.1	37.1	38.1	39.5	40.8	41.4	
	19	102	37.9	1.83	33.4	35.7	37.0	37.9	39.0	40.0	41.8	
	20	96	38.8	1.74	35.3	36.4	37.5	39.1	40.1	40.7	41.6	
	21	95	37.9	1.69	34.6	35.7	36.7	37.9	38.9	40.1	41.7	
	22	87	38.8	2.00	35.5	36.2	37.2	38.9	40.1	41.6	42.7	
	F	6	94	25.7	1.29	23.3	24.1	24.8	25.9	26.6	27.2	28.7
		7	159	26.7	1.65	24.1	24.8	25.4	26.7	27.8	28.8	29.8
		8	146	28.2	1.73	25.2	26.0	27.0	28.1	29.5	30.4	31.8
		9	155	29.5	2.12	26.0	27.5	28.3	29.5	30.6	31.8	33.2
		10	147	30.5	2.07	27.0	27.9	29.0	30.6	32.2	33.2	34.0
11		151	31.7	1.90	27.9	29.1	30.4	32.0	33.0	33.9	35.4	
12		175	33.2	1.85	29.5	31.0	31.8	33.2	34.6	35.6	36.5	
13		159	33.8	1.59	31.0	31.9	32.8	33.8	35.0	35.9	36.9	
14		176	34.3	1.58	31.2	32.2	33.3	34.3	35.2	36.3	37.4	
15		169	34.5	1.70	31.1	32.2	33.4	34.6	35.6	36.6	37.5	
16		187	34.7	1.69	31.4	32.5	33.5	34.8	35.7	36.9	37.9	
17		202	34.8	1.40	32.1	33.0	33.9	34.7	35.6	36.5	37.7	
18		186	34.5	1.89	31.4	32.3	33.5	34.5	35.6	37.0	37.9	
19		127	34.5	1.68	31.6	32.5	33.4	34.4	35.6	36.6	37.4	
20		99	34.4	1.21	31.9	32.7	33.8	34.4	35.3	36.0	36.8	
21		100	34.8	1.46	31.5	32.5	34.0	35.0	35.9	36.5	37.4	
22		93	34.4	1.78	31.5	32.4	33.1	34.5	35.7	36.2	37.1	

Table 3-2-3-12 Pelvis width (cm)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>	
M	6	104	18.5	1.63	16.3	16.7	17.3	18.3	19.3	20.8	21.6	
	7	201	19.0	1.55	16.5	17.3	18.0	18.8	19.7	21.0	22.4	
	8	172	20.2	2.02	17.1	18.0	18.9	20.0	21.3	22.9	25.3	
	9	202	20.6	1.80	17.8	18.4	19.3	20.4	21.5	23.1	24.2	
	10	173	21.4	1.86	18.5	19.4	20.2	21.2	22.4	23.9	26.2	
	11	149	22.6	2.07	19.4	20.0	21.1	22.4	24.0	25.4	27.1	
	12	196	23.9	2.29	20.0	21.5	22.4	23.6	25.1	26.9	29.3	
	13	185	24.7	2.08	20.6	22.1	23.5	24.6	25.8	27.3	29.2	
	14	162	25.5	1.77	22.3	23.0	24.3	25.4	26.7	27.8	29.6	
	15	188	25.8	1.91	22.2	23.7	24.5	25.6	27.0	28.2	30.1	
	16	162	26.2	1.89	23.0	23.9	25.0	26.1	27.4	28.4	29.8	
	17	186	26.3	1.82	23.2	24.1	25.0	26.2	27.3	28.7	30.5	
	18	143	26.5	1.94	23.1	24.0	25.3	26.4	27.6	28.9	31.5	
	19	102	26.4	1.90	23.8	24.3	25.4	26.1	27.1	28.8	31.4	
	20	96	26.3	1.73	23.6	24.2	25.3	26.1	27.3	28.8	30.0	
	21	95	26.2	1.66	23.5	24.1	25.1	26.1	27.2	28.9	29.3	
	22	87	26.7	1.40	24.1	25.2	25.8	26.4	27.5	28.9	29.6	
	F	6	94	18.7	1.28	16.6	17.0	17.8	18.5	19.4	20.5	21.5
		7	159	19.3	1.47	16.4	17.5	18.3	19.1	20.0	21.3	22.5
		8	146	20.3	1.53	17.6	18.4	19.1	20.1	21.3	22.3	23.5
		9	155	21.5	1.78	18.7	19.4	20.2	21.2	22.4	24.0	25.8
		10	147	22.2	2.03	18.7	19.6	20.4	22.3	23.5	25.1	26.0
11		151	23.0	2.29	18.5	20.2	21.8	23.0	24.3	25.6	27.3	
12		175	24.6	2.31	20.5	22.2	23.2	24.6	25.8	27.2	29.3	
13		159	25.4	1.83	22.5	23.3	24.2	25.3	26.5	27.5	29.3	
14		176	25.7	1.77	22.3	23.6	24.8	25.6	26.6	27.7	29.5	
15		169	26.1	1.82	22.7	24.0	25.1	26.0	27.1	28.1	30.0	
16		187	26.3	1.69	23.0	24.1	25.3	26.3	27.4	28.4	29.2	
17		203	26.5	1.68	23.5	24.5	25.5	26.4	27.4	28.4	29.7	
18		186	26.0	1.66	23.0	24.0	25.0	25.9	27.1	28.0	28.9	
19		128	26.2	1.49	23.4	24.5	25.1	26.2	27.0	28.0	29.2	
20		99	26.2	1.71	23.0	24.4	25.2	26.0	27.3	28.3	30.3	
21		100	26.5	1.70	23.9	24.7	25.3	26.5	27.5	28.5	29.0	
22		93	26.3	1.64	22.8	24.1	25.2	26.3	27.2	28.2	30.0	

Table 3-2-3-13 Upper arm skinfold thickness (mm)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>	
M	6	104	8.1	6.43	1.0	1.8	3.6	5.5	10.9	20.5	22.9	
	7	200	8.3	5.40	2.0	3.0	4.1	7.0	10.5	16.0	21.5	
	8	172	11.1	6.58	2.0	3.2	5.5	10.0	16.0	20.7	25.4	
	9	201	10.7	7.14	1.0	2.6	5.0	10.0	15.0	21.0	28.0	
	10	172	12.2	7.14	2.6	4.0	6.0	10.3	17.0	22.9	29.4	
	11	149	13.2	7.34	2.8	4.5	7.3	12.0	17.8	24.0	31.0	
	12	196	13.1	7.66	3.5	5.0	7.0	11.0	17.5	25.2	32.0	
	13	185	10.2	6.65	1.3	3.0	5.3	8.0	14.0	20.5	26.4	
	14	162	9.2	6.53	1.0	2.5	4.5	7.5	12.1	19.9	25.1	
	15	188	8.2	5.71	1.3	3.0	4.0	7.0	10.8	16.0	23.0	
	16	162	8.3	6.36	1.5	2.5	4.0	6.5	10.6	16.9	24.6	
	17	186	9.7	5.98	1.5	3.0	5.0	9.0	13.5	18.7	22.4	
	18	143	8.9	5.83	2.0	3.0	4.5	8.0	11.5	16.3	23.7	
	19	102	8.8	5.49	1.0	2.7	4.5	8.3	12.0	16.9	22.8	
	20	96	9.7	6.44	3.0	4.0	5.0	7.5	12.0	20.3	25.3	
	21	95	8.5	4.77	1.9	3.0	5.0	7.5	11.5	15.9	20.1	
	22	87	10.5	5.01	2.3	4.0	6.0	10.0	15.0	16.5	20.0	
	F	6	94	10.1	4.91	2.0	3.5	6.5	10.0	13.6	16.0	22.7
		7	159	11.0	5.38	3.0	4.5	6.5	10.0	14.5	18.5	23.1
		8	146	12.4	6.73	3.0	5.0	7.5	11.0	15.6	23.0	28.0
		9	155	13.9	6.76	3.7	5.5	8.0	13.5	18.0	24.0	28.3
		10	147	14.5	6.86	4.2	6.5	9.5	13.0	18.5	25.1	29.3
11		151	14.0	6.28	4.6	7.0	9.5	12.5	17.5	23.0	29.4	
12		175	16.0	6.78	5.3	8.0	10.0	15.0	20.5	25.2	30.9	
13		159	17.9	6.53	7.5	9.5	13.5	17.5	21.0	26.0	36.1	
14		176	17.8	6.47	5.7	11.0	13.5	16.8	22.0	26.0	30.5	
15		169	20.8	6.18	10.0	12.5	16.0	21.0	24.5	29.0	34.9	
16		187	20.6	6.43	10.5	12.5	16.0	20.0	25.0	29.0	34.2	
17		203	20.2	6.43	10.1	12.0	15.0	20.0	23.5	28.8	34.9	
18		186	19.3	5.91	10.3	11.9	15.5	18.5	23.1	26.3	30.4	
19		128	18.4	5.08	8.4	11.5	15.5	18.3	21.5	25.0	27.3	
20		99	19.0	6.14	9.0	12.0	15.0	18.0	22.5	27.0	32.0	
21		100	18.8	5.17	9.0	12.5	15.5	18.5	22.0	25.5	29.9	
22		93	18.5	6.24	9.0	10.4	12.5	18.5	24.0	26.0	30.2	

Table 3-2-3-14 Subscapular skinfold thickness (mm)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	6	104	5.1	5.87	0.5	0.5	1.0	3.0	6.5	15.0	21.6
	7	201	4.7	4.78	0.5	0.5	2.0	3.0	5.5	11.0	18.0
	8	172	8.0	7.45	0.5	1.0	2.5	5.0	12.0	21.0	27.4
	9	202	7.7	7.79	0.5	1.0	2.0	5.0	11.1	19.9	29.7
	10	173	9.0	7.76	0.5	1.5	3.3	6.0	14.0	20.6	27.4
	11	149	10.3	8.20	1.8	2.5	4.0	7.5	15.5	22.0	30.3
	12	196	11.8	9.56	2.0	3.0	4.5	8.3	17.0	26.5	35.2
	13	185	9.9	8.58	1.3	2.5	4.5	6.5	12.5	23.9	33.1
	14	162	9.7	7.25	2.4	3.0	4.5	6.8	13.0	20.9	28.0
	15	188	8.5	6.06	3.0	3.5	4.5	6.5	10.4	15.6	26.3
	16	162	9.3	6.51	2.5	3.5	5.0	7.5	11.1	17.5	27.6
	17	186	10.8	6.13	3.0	4.5	6.4	9.0	13.1	20.0	28.4
	18	143	10.7	5.69	4.0	5.2	6.5	9.0	13.0	20.0	25.7
	19	102	11.3	6.12	3.0	5.2	7.0	9.5	15.1	20.0	28.3
20	96	12.1	6.79	4.0	6.0	8.0	10.0	15.0	21.2	32.2	
21	95	11.7	5.87	3.9	5.5	7.5	11.0	15.0	20.0	24.4	
22	87	14.5	6.78	5.3	6.9	8.5	12.5	21.5	25.0	27.2	
F	6	94	5.9	4.34	0.5	1.0	2.9	5.0	8.0	11.3	18.3
	7	159	5.9	4.87	0.5	1.0	3.0	4.5	7.5	11.5	20.3
	8	146	7.2	6.73	0.5	2.0	3.0	5.0	8.5	16.8	27.3
	9	155	9.6	8.16	1.3	2.3	3.5	7.0	12.5	23.0	29.6
	10	147	9.9	7.51	1.0	2.5	4.0	7.5	13.5	21.3	28.1
	11	151	10.4	6.08	2.3	4.0	6.0	9.0	13.5	19.9	25.4
	12	175	11.8	6.85	3.0	5.0	7.0	10.0	15.0	20.5	27.1
	13	159	12.5	6.56	4.5	6.0	7.0	11.0	16.5	20.5	29.6
	14	176	13.1	6.36	4.7	6.0	8.5	12.0	16.4	22.0	29.7
	15	169	15.5	6.30	5.1	7.5	10.5	15.0	19.5	24.0	29.9
	16	187	15.5	7.14	5.0	7.8	10.5	14.0	18.0	26.7	32.7
	17	203	14.7	6.82	5.6	7.5	10.0	13.0	18.0	25.0	29.9
	18	186	14.1	5.96	6.0	8.0	10.0	13.0	17.1	21.7	27.7
	19	128	13.8	4.84	6.4	8.0	10.5	13.0	16.9	20.0	24.5
20	98	13.1	5.63	5.0	7.0	9.0	12.8	15.6	20.6	31.0	
21	100	13.8	5.45	5.0	7.6	9.6	13.0	16.5	21.0	27.9	
22	93	13.6	5.76	4.9	7.4	9.8	12.0	16.5	23.3	26.4	

Table 3-2-3-15 Abdominal skinfold thickness (mm)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	6	104	6.7	8.47	0.5	0.5	1.0	3.0	8.4	21.0	30.6
	7	201	6.5	6.37	0.5	0.5	2.0	4.0	10.0	17.0	23.0
	8	172	11.1	9.39	0.5	1.2	3.0	8.0	17.9	25.4	32.7
	9	202	11.3	10.41	0.5	1.0	2.5	7.8	18.1	26.0	36.9
	10	173	12.9	10.07	1.0	2.0	4.5	10.0	20.0	28.6	34.0
	11	149	15.7	11.23	1.3	3.0	5.0	14.0	24.3	32.0	38.0
	12	196	17.4	11.96	2.4	4.5	7.5	14.8	26.0	35.2	42.7
	13	185	13.6	10.82	1.0	3.0	5.5	10.0	20.0	30.2	39.4
	14	162	12.8	9.74	1.5	3.0	5.0	10.5	18.0	27.4	38.1
	15	188	11.1	8.81	1.5	2.5	4.6	8.8	14.5	25.1	33.3
	16	162	11.9	9.20	1.5	3.0	5.0	8.5	17.3	25.5	36.2
	17	186	13.8	9.09	2.5	3.9	6.5	11.3	21.0	27.5	31.4
	18	143	13.7	9.12	2.7	4.5	6.5	11.5	19.0	27.6	35.0
	19	102	15.0	9.18	3.0	4.5	8.0	12.8	21.0	28.0	34.7
20	96	16.4	10.03	3.0	4.9	8.0	13.8	23.8	32.2	38.2	
21	95	15.8	9.12	1.9	5.0	9.5	14.5	22.0	29.2	33.0	
22	87	18.3	9.34	3.0	5.9	10.0	20.0	25.0	30.5	35.5	
F	6	94	8.6	5.96	0.5	2.0	4.0	7.5	12.0	17.5	22.6
	7	159	9.1	6.64	0.9	2.0	4.5	7.5	13.0	18.5	26.4
	8	146	10.9	8.88	1.0	2.0	4.4	8.5	15.6	24.0	33.8
	9	155	13.5	9.12	1.8	3.0	5.0	12.5	20.0	27.0	34.0
	10	147	15.6	10.23	1.2	3.4	7.0	15.0	22.0	31.0	37.6
	11	151	15.9	8.04	3.8	6.0	10.0	15.0	21.0	25.9	34.7
	12	175	18.5	8.62	5.6	8.3	12.5	16.5	23.5	30.7	38.2
	13	159	19.7	8.23	7.4	11.0	14.0	18.0	24.0	29.5	41.0
	14	176	20.0	7.74	6.2	10.4	14.5	19.5	25.0	30.0	35.2
	15	169	22.5	6.73	9.6	14.0	18.0	23.0	26.5	32.0	35.5
	16	186	22.1	7.04	10.0	13.0	17.0	21.8	27.5	31.3	36.0
	17	203	21.7	6.68	10.6	13.5	16.0	21.0	26.0	30.5	35.9
	18	186	20.6	5.95	9.8	13.4	16.0	21.0	24.1	28.0	33.8
	19	128	20.3	5.49	9.4	12.5	17.0	20.8	24.0	26.0	30.8
20	98	21.7	6.66	9.0	13.4	18.0	21.5	25.5	28.1	38.0	
21	100	21.2	6.87	6.2	13.5	16.5	20.5	26.0	30.5	34.5	
22	93	20.9	6.67	10.6	13.0	16.0	20.0	25.3	28.3	38.5	

Table 3-2-3-16 Percentage body fat (%)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	9	188	17.8	9.05	7.6	8.2	10.6	15.3	22.2	31.2	40.6
	10	165	19.3	9.09	9.1	10.2	11.9	16.3	24.9	33.7	42.3
	11	148	20.3	9.58	9.1	10.6	13.3	17.6	26.3	33.9	45.8
	12	196	19.5	9.23	9.3	10.4	12.2	16.8	24.8	33.3	41.0
	13	183	17.0	7.90	7.8	9.5	11.4	14.0	19.9	30.0	35.4
	14	161	16.3	7.14	8.3	9.4	10.9	14.0	19.8	28.0	34.0
	15	187	11.8	6.75	4.9	6.0	7.2	10.0	13.5	20.4	30.3
	16	162	12.2	7.49	4.6	5.5	7.5	9.7	14.7	21.4	32.4
	17	184	14.0	6.83	5.9	6.9	8.9	12.3	17.6	23.2	32.4
	18	143	13.4	6.64	5.5	7.2	8.6	11.8	15.9	22.8	29.9
	19	100	13.9	5.12	6.8	8.6	10.2	12.9	16.5	20.7	26.8
	20	96	14.6	5.99	7.5	9.2	10.5	12.9	16.7	23.8	31.1
	21	95	13.8	4.75	7.6	8.7	10.2	12.3	16.7	20.7	24.6
	22	87	16.0	5.20	8.1	9.7	10.7	16.0	21.2	23.0	25.0
F	9	154	22.9	8.59	12.3	13.7	16.2	21.5	27.3	37.1	43.3
	10	145	23.6	8.31	12.7	14.7	17.4	21.5	27.5	36.3	43.7
	11	151	23.3	7.17	13.4	15.5	18.3	22.1	26.9	34.8	40.7
	12	175	22.7	8.49	11.2	13.0	16.4	21.4	27.6	33.0	41.3
	13	159	24.4	8.08	13.2	15.2	18.9	22.7	28.2	33.9	47.4
	14	176	24.7	7.94	11.9	16.5	19.2	23.4	29.5	34.5	40.7
	15	169	27.5	8.08	14.9	17.1	21.6	26.8	32.0	37.6	46.3
	16	187	27.4	8.79	14.8	17.7	21.1	26.5	32.0	39.8	48.9
	17	203	26.6	8.52	14.0	16.9	20.4	25.8	29.9	38.5	46.3
	18	186	25.5	7.77	14.5	17.5	20.4	23.7	29.5	35.6	43.8
	19	128	22.4	5.05	13.2	17.0	19.0	21.5	25.9	27.9	32.5
	20	98	22.4	6.29	13.3	15.1	18.6	21.5	25.3	30.2	39.1
	21	100	22.6	5.38	14.1	16.2	19.2	22.2	25.6	28.7	33.9
	22	93	22.3	6.28	13.6	15.1	16.9	21.7	27.0	31.5	35.5

Table 3-2-3-17 Lean body mass (kg)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	9	188	26.1	4.06	19.3	21.5	23.1	25.6	28.4	31.3	34.6
	10	165	28.1	4.05	21.1	23.4	25.3	27.8	30.6	33.2	38.0
	11	148	31.6	5.61	23.2	24.9	27.5	30.8	34.8	39.8	44.4
	12	196	36.5	6.27	25.7	29.0	32.2	36.1	40.5	45.2	49.7
	13	183	41.9	7.00	29.0	32.9	37.3	41.9	46.2	51.2	56.9
	14	161	45.8	7.36	33.1	36.8	41.0	44.5	49.7	56.7	62.4
	15	187	49.6	6.83	37.7	41.9	44.9	48.9	54.0	58.8	64.0
	16	162	51.3	6.97	39.4	43.5	46.2	51.0	55.0	60.0	67.2
	17	184	51.8	5.89	41.3	44.3	47.6	51.7	55.3	59.7	64.4
	18	143	53.2	6.87	41.5	44.6	47.9	53.0	56.6	61.5	67.6
	19	100	52.2	6.02	43.7	45.1	48.3	51.6	56.1	59.7	65.2
	20	96	53.5	5.83	44.9	46.9	49.9	52.2	57.1	63.1	66.2
	21	95	55.5	6.44	44.1	46.2	52.0	55.0	61.3	64.6	66.9
	22	87	55.4	6.95	45.5	47.7	49.8	54.1	59.4	66.0	73.9
F	9	154	24.2	3.24	18.6	20.2	21.6	24.3	26.2	27.9	30.8
	10	145	27.5	4.57	20.3	22.3	23.8	26.7	31.3	34.3	35.4
	11	151	30.3	4.42	20.6	24.6	27.7	30.7	33.0	35.4	39.8
	12	175	34.6	4.44	25.8	28.6	31.4	35.1	37.4	39.6	42.7
	13	159	35.6	4.08	28.7	31.3	33.1	35.3	37.9	40.2	44.1
	14	176	37.2	3.92	30.7	32.4	34.5	37.1	39.4	42.4	45.5
	15	168	37.2	4.28	31.0	32.1	34.2	36.8	40.0	42.5	45.4
	16	187	37.1	4.09	30.2	31.7	34.3	37.0	40.1	42.5	45.1
	17	202	38.0	3.98	30.8	33.8	35.3	37.5	40.3	43.3	46.9
	18	186	37.9	3.90	31.3	33.4	35.2	37.7	40.4	42.9	46.2
	19	128	39.7	4.42	32.0	34.6	36.9	39.1	42.2	45.2	48.2
	20	98	39.8	3.82	32.3	35.5	37.1	39.7	42.6	44.8	47.0
	21	100	39.1	3.68	33.3	34.3	36.5	38.8	41.2	43.7	47.1
	22	93	38.6	3.26	32.9	34.3	36.0	38.3	40.8	42.5	45.6



2.4. Physiological Function

Table 3-2-4-1 Resting pulse (times/min)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>	
M	6	104	88.3	8.38	72.3	78.0	82.0	88.0	94.0	100.0	102.0	
	7	201	85.9	8.23	72.0	76.0	80.0	84.0	90.0	98.0	102.0	
	8	172	86.5	9.30	70.4	76.0	80.0	84.0	93.5	99.7	109.6	
	9	202	85.0	9.17	72.0	74.0	78.0	84.0	90.0	96.0	105.8	
	10	173	83.0	8.63	68.4	72.0	78.0	82.0	88.0	94.0	102.0	
	11	149	82.7	9.26	66.0	72.0	77.0	82.0	89.0	96.0	100.0	
	12	196	83.6	10.49	67.8	72.0	76.0	84.0	90.0	96.0	108.2	
	13	185	82.0	8.62	66.0	72.0	77.0	82.0	88.0	94.0	100.0	
	14	162	82.9	9.23	66.0	72.0	76.0	82.0	88.0	96.0	104.0	
	15	188	81.3	9.90	66.0	68.0	74.0	82.0	88.0	94.0	100.7	
	16	161	78.4	9.03	60.0	66.4	72.0	78.0	84.0	90.0	96.1	
	17	186	79.1	10.51	60.0	66.0	72.0	78.0	86.0	92.0	100.8	
	18	143	79.4	10.44	64.0	68.0	72.0	78.0	86.0	93.2	104.0	
	19	102	77.7	9.00	58.2	66.6	72.0	78.0	84.0	88.0	97.8	
	20	96	75.2	8.85	58.9	66.0	68.3	74.0	80.0	88.0	94.4	
	21	95	74.8	9.41	60.0	63.6	68.0	74.0	80.0	90.8	96.2	
	22	87	77.2	7.00	65.3	68.0	70.0	78.0	82.0	86.4	90.0	
	F	6	94	87.9	8.81	72.0	76.0	81.8	88.0	94.0	100.0	104.0
		7	159	86.9	8.85	71.6	76.0	82.0	86.0	92.0	100.0	104.4
		8	146	86.4	10.18	72.0	74.0	78.0	84.5	92.0	102.0	111.2
		9	155	85.0	9.52	70.0	74.0	78.0	84.0	90.0	96.8	106.6
		10	147	84.9	9.62	68.9	72.0	78.0	84.0	90.0	98.0	107.1
11		151	84.2	9.59	69.1	74.0	78.0	82.0	90.0	97.6	105.8	
12		175	83.8	9.94	68.0	74.0	78.0	82.0	88.0	96.8	106.0	
13		159	81.8	9.58	66.0	70.0	76.0	80.0	88.0	94.0	104.0	
14		176	81.7	8.75	66.0	71.4	76.0	80.0	88.0	92.0	100.7	
15		169	83.6	9.29	68.0	72.0	78.0	82.0	90.0	96.0	102.0	
16		186	81.4	9.11	66.0	70.0	75.0	80.0	86.0	92.0	100.8	
17		202	79.4	9.62	66.0	68.0	72.0	78.0	84.0	92.0	96.0	
18		186	78.8	8.96	62.0	66.0	72.0	78.0	84.0	90.0	96.0	
19		128	77.1	8.61	63.7	66.0	72.0	76.0	84.0	90.0	96.0	
20		99	77.7	8.15	61.0	69.0	72.0	77.0	82.0	88.0	96.0	
21		100	76.4	8.17	60.0	66.2	72.0	76.0	80.0	87.8	96.0	
22		93	76.1	7.04	64.0	68.0	70.0	76.0	80.0	88.0	88.4	

Table 3-2-4-2 Systolic pressure (mmHg)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>	
M	6	104	92.2	9.41	74.0	80.0	86.0	92.0	98.0	104.0	109.7	
	7	201	94.8	8.95	80.0	82.4	88.0	94.0	100.0	108.0	112.0	
	8	172	100.7	9.19	85.2	88.0	94.0	100.5	108.0	111.4	118.0	
	9	202	103.0	8.92	86.0	90.0	96.8	102.0	110.0	114.7	118.0	
	10	173	104.8	9.13	88.4	94.0	98.0	106.0	110.0	118.0	123.6	
	11	149	105.9	9.83	89.0	94.0	98.0	106.0	112.0	118.0	125.5	
	12	196	109.5	9.68	93.8	97.4	102.0	110.0	116.0	122.6	128.0	
	13	185	113.5	9.11	96.0	102.0	108.0	114.0	120.0	126.0	130.0	
	14	162	115.4	9.46	97.3	105.3	108.0	116.0	122.0	128.0	132.4	
	15	188	116.0	9.38	98.0	102.0	110.0	116.0	122.0	130.0	134.0	
	16	162	118.1	10.30	95.8	106.0	110.0	118.0	126.0	130.0	136.0	
	17	186	119.7	10.46	100.0	108.0	114.0	120.0	126.0	130.6	140.0	
	18	143	118.2	9.50	98.0	108.0	112.0	118.0	124.0	130.0	136.0	
	19	102	117.7	9.63	98.2	105.3	111.5	118.0	124.0	130.0	137.8	
	20	96	118.3	8.61	103.8	108.0	112.0	118.0	125.8	128.6	135.3	
	21	95	118.9	7.37	104.0	108.0	114.0	118.0	124.0	130.0	132.0	
	22	87	124.6	9.29	109.3	110.0	116.0	126.0	132.0	138.0	140.7	
	F	6	94	89.9	8.73	75.4	80.0	83.5	88.0	96.0	102.0	108.3
		7	159	94.2	9.26	77.6	82.0	88.0	94.0	100.0	106.0	110.4
		8	146	96.3	8.45	82.0	86.0	90.0	95.5	102.0	108.0	114.0
		9	155	102.3	8.31	88.0	90.0	96.0	102.0	108.0	112.0	118.6
		10	147	104.4	8.70	90.0	94.0	98.0	104.0	110.0	116.0	122.0
11		151	104.9	8.75	90.0	94.0	100.0	104.0	112.0	116.0	122.0	
12		175	107.9	9.47	87.1	97.2	100.0	108.0	114.0	120.0	125.4	
13		158	110.0	8.66	94.3	98.0	104.0	110.0	116.0	122.0	128.0	
14		176	111.0	9.36	91.0	99.4	106.0	110.0	117.8	122.0	130.0	
15		169	110.6	10.50	88.0	98.0	104.0	110.0	116.0	124.0	130.0	
16		187	110.8	9.57	93.6	98.0	105.0	110.0	116.0	126.0	130.0	
17		202	111.4	10.36	90.2	98.6	104.0	110.0	118.0	126.0	131.8	
18		186	110.5	9.34	91.2	100.0	104.0	110.0	116.0	122.0	128.8	
19		128	110.1	9.96	89.5	96.0	104.0	110.0	118.0	122.0	128.3	
20		99	111.1	9.41	94.0	98.0	105.0	110.0	118.0	124.0	130.0	
21		100	109.5	8.09	96.0	100.0	104.0	108.0	116.0	120.0	125.0	
22		93	108.8	8.15	94.0	98.0	104.0	110.0	114.0	121.2	126.0	

Table 3-2-4-3 Diastolic pressure (mmHg)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>	
M	6	101	57.4	7.62	42.1	50.0	52.0	56.0	60.0	69.6	75.8	
	7	200	58.9	7.63	48.0	50.0	54.0	58.0	62.8	70.0	73.9	
	8	172	60.5	6.67	50.0	50.0	56.0	60.0	65.0	70.0	73.6	
	9	202	63.4	7.31	50.0	54.0	60.0	61.0	70.0	72.0	77.8	
	10	173	64.8	6.78	52.0	56.0	60.0	64.0	70.0	74.0	78.0	
	11	149	64.9	7.72	52.0	54.0	60.0	64.0	70.0	76.0	80.0	
	12	196	67.3	7.57	53.8	58.0	60.0	68.0	72.0	78.0	80.2	
	13	185	68.8	7.53	56.0	60.0	64.0	70.0	74.0	80.0	80.8	
	14	162	71.2	7.92	57.8	60.0	66.0	70.0	78.0	80.0	86.0	
	15	188	70.7	6.88	58.0	60.0	68.0	70.0	75.0	80.0	85.3	
	16	162	72.0	6.71	60.0	62.0	70.0	70.0	76.0	80.0	84.1	
	17	186	73.9	7.32	60.0	64.0	70.0	72.0	80.0	82.0	89.0	
	18	142	73.2	6.99	60.0	62.0	70.0	73.0	80.0	80.7	86.0	
	19	102	72.5	6.42	60.2	65.3	68.8	70.0	78.0	80.0	84.0	
	20	96	75.0	7.56	60.0	65.7	68.5	76.0	80.0	84.0	90.5	
	21	95	74.9	7.06	62.0	68.0	70.0	74.0	80.0	86.0	90.0	
	22	87	78.4	6.58	61.3	70.0	76.0	80.0	84.0	86.0	88.7	
	F	6	92	57.3	7.10	46.7	50.0	52.0	58.0	60.0	70.0	72.0
		7	158	58.8	7.04	48.0	50.0	54.0	60.0	62.0	70.0	72.2
		8	146	58.6	6.30	48.0	50.0	54.0	60.0	62.0	68.6	71.2
		9	155	62.9	6.60	50.0	55.2	60.0	60.0	68.0	70.8	76.6
		10	147	64.0	5.72	53.4	58.0	60.0	62.0	70.0	70.0	74.0
11		151	65.5	7.08	55.6	58.0	60.0	64.0	70.0	74.0	80.0	
12		175	67.5	6.87	54.0	58.0	62.0	70.0	70.0	76.0	80.0	
13		159	68.7	6.64	56.8	60.0	64.0	70.0	72.0	78.0	80.0	
14		176	69.5	7.67	56.6	60.0	62.0	70.0	76.0	80.0	81.4	
15		169	69.9	7.46	56.0	60.0	64.0	70.0	74.5	80.0	82.0	
16		187	69.8	7.01	58.0	60.0	64.0	70.0	75.0	80.0	83.0	
17		202	70.9	6.85	58.0	62.0	68.0	70.0	76.0	80.0	82.9	
18		186	70.2	7.14	60.0	60.0	64.0	70.0	74.3	80.0	84.4	
19		128	69.1	7.63	55.7	60.0	62.3	70.0	75.5	80.0	82.0	
20		99	70.1	7.42	58.0	60.0	65.0	70.0	78.0	80.0	85.0	
21		100	69.1	6.39	60.0	60.0	64.0	70.0	72.0	78.0	81.9	
22		93	68.2	5.80	60.0	60.0	64.0	68.0	70.0	78.0	80.0	

Table 3-2-4-4 Pressure difference (mmHg)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>	
M	6	101	34.8	6.91	20.1	26.0	31.0	36.0	39.0	44.0	48.0	
	7	200	35.9	6.60	24.0	28.0	32.0	36.0	40.0	44.0	48.0	
	8	172	40.1	6.98	28.0	30.6	35.0	40.0	44.0	50.0	54.0	
	9	202	39.6	7.86	26.0	30.0	35.0	40.0	44.0	51.4	55.8	
	10	173	40.0	7.92	26.4	31.0	34.0	40.0	44.5	48.0	57.6	
	11	149	41.0	8.69	25.0	30.0	36.0	40.0	46.0	52.0	58.0	
	12	196	42.2	8.06	28.0	32.0	36.0	42.0	48.0	52.3	60.0	
	13	185	44.7	8.70	30.0	32.0	38.0	44.0	50.0	56.0	62.0	
	14	162	44.1	8.17	29.9	34.0	38.0	44.0	50.0	54.0	60.0	
	15	188	45.3	9.75	28.0	34.0	38.0	44.5	51.5	58.2	68.0	
	16	162	46.1	9.43	30.0	34.0	40.0	46.0	52.0	58.0	66.0	
	17	186	45.8	9.91	30.0	34.0	40.0	44.0	50.0	58.0	71.6	
	18	142	45.0	9.06	30.6	34.0	38.0	44.0	50.5	58.0	63.7	
	19	102	45.2	8.38	30.2	34.0	40.0	46.0	50.0	55.4	63.8	
	20	96	43.3	8.04	27.8	33.4	38.0	44.0	48.0	54.0	62.0	
	21	95	44.1	7.60	33.5	36.0	38.0	42.0	50.0	56.0	62.0	
	22	87	46.2	9.90	30.0	32.0	38.0	48.0	54.0	56.8	66.0	
	F	6	92	32.6	5.71	20.0	26.0	30.0	32.0	36.0	40.0	44.8
		7	158	35.4	6.50	23.8	26.9	30.8	35.0	40.0	44.0	46.0
		8	146	37.7	6.67	23.2	30.0	34.0	38.0	42.0	46.6	53.2
		9	155	39.4	7.32	28.0	30.0	34.0	38.0	44.0	50.0	56.6
		10	147	40.5	7.90	28.0	31.8	34.0	40.0	46.0	50.0	59.1
11		151	39.5	7.79	28.0	30.0	34.0	39.0	44.0	50.0	54.9	
12		175	40.4	8.18	26.0	30.0	34.0	40.0	46.0	54.0	56.0	
13		158	41.3	7.57	27.5	32.0	37.8	40.0	46.0	50.2	60.0	
14		176	41.4	8.67	26.6	30.0	36.0	40.0	46.0	52.0	58.0	
15		169	40.7	8.58	27.1	31.0	34.0	40.0	46.0	54.0	59.8	
16		187	40.9	8.50	27.3	32.0	36.0	40.0	44.0	52.0	60.7	
17		202	40.4	8.27	24.0	30.0	36.0	40.0	45.0	52.0	54.0	
18		186	40.3	7.39	28.0	32.0	35.8	40.0	44.3	50.0	55.4	
19		128	41.0	8.98	22.0	30.0	36.0	42.0	47.5	50.2	58.0	
20		99	41.0	7.85	28.0	30.0	34.0	42.0	48.0	52.0	56.0	
21		100	40.5	7.34	28.1	32.0	36.0	40.0	46.0	48.0	55.9	
22		93	40.6	7.84	29.6	32.0	34.0	40.0	46.0	52.0	56.0	

Table 3-2-4-5 Vital capacity (ml)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	6	104	1068.7	262.08	553.0	717.5	864.0	1075.0	1275.8	1407.0	1519.9
	7	200	1255.3	271.67	745.5	888.9	1090.5	1234.5	1463.8	1614.7	1764.6
	8	172	1517.4	373.57	890.4	1055.0	1250.5	1500.0	1755.0	2042.0	2246.6
	9	202	1741.0	408.37	1055.2	1193.3	1467.5	1739.0	1955.0	2300.5	2533.8
	10	173	1924.8	480.10	1109.1	1314.2	1626.0	1905.0	2175.0	2471.0	3141.9
	11	149	2162.8	515.21	1077.0	1465.0	1847.5	2145.0	2497.5	2809.0	3130.0
	12	196	2586.6	576.60	1647.8	1888.5	2198.0	2542.0	2984.3	3233.0	3838.5
	13	185	2969.9	653.34	1701.1	2160.2	2455.5	3025.0	3414.0	3833.4	4199.9
	14	162	3432.2	680.00	2159.1	2689.4	3021.8	3385.0	3795.0	4237.0	4713.1
	15	188	3660.0	743.43	2274.9	2826.8	3199.8	3595.0	4065.0	4554.9	5384.7
	16	162	3793.1	674.61	2519.7	3011.8	3323.5	3772.0	4257.5	4681.0	5108.3
	17	186	4036.0	828.50	2675.5	3116.6	3512.0	3982.5	4512.5	5029.0	5877.1
	18	143	3915.8	633.33	2688.7	3061.0	3500.0	3925.0	4305.0	4678.6	5100.8
	19	102	3997.0	642.41	3100.7	3279.8	3495.0	3913.5	4301.3	5122.0	5440.5
	20	95	4147.4	670.71	2968.2	3385.2	3760.0	4108.0	4458.0	4970.0	5547.2
	21	95	4170.9	696.76	2976.9	3222.0	3615.0	4090.0	4795.0	5105.2	5398.9
	22	87	4131.6	510.05	3222.6	3579.4	3782.0	4115.0	4450.0	4737.8	5251.1
F	6	94	987.5	235.74	543.0	671.5	811.0	993.5	1151.3	1267.0	1538.8
	7	158	1179.0	276.53	628.9	837.4	992.5	1168.5	1364.0	1570.5	1716.9
	8	146	1351.0	311.94	764.4	1000.6	1129.5	1307.5	1572.0	1755.4	2015.4
	9	155	1623.5	336.48	982.1	1251.0	1425.0	1610.0	1813.0	2016.8	2384.0
	10	147	1830.2	449.77	1091.6	1286.0	1496.0	1781.0	2120.0	2426.6	2813.5
	11	151	2080.8	510.21	1064.2	1423.0	1745.0	2092.0	2430.0	2722.0	3033.9
	12	175	2311.4	527.67	1175.6	1588.2	2065.0	2305.0	2555.0	3014.8	3366.0
	13	159	2448.4	501.51	1569.8	1840.0	2106.0	2410.0	2756.0	3145.0	3523.0
	14	176	2624.7	568.33	1559.5	1973.1	2316.0	2615.0	3043.8	3290.0	3465.0
	15	169	2669.6	583.42	1549.0	2065.0	2273.0	2593.0	3007.0	3345.0	3970.6
	16	187	2635.5	509.36	1622.0	2016.4	2322.0	2616.0	2940.0	3278.0	3589.2
	17	203	2843.6	619.79	1708.8	2112.0	2490.0	2775.0	3155.0	3619.0	4319.8
	18	186	2706.1	487.32	1714.3	2100.0	2375.8	2671.0	3046.3	3386.8	3604.9
	19	128	2713.2	507.45	1824.2	2160.7	2352.5	2712.0	3073.5	3324.5	3795.5
	20	99	2751.7	532.13	1878.0	2103.0	2303.0	2735.0	3137.0	3459.0	3930.0
	21	100	2688.4	474.80	1795.0	2137.8	2357.8	2715.0	3045.8	3277.0	3473.7
	22	93	2636.5	547.77	1564.3	1891.6	2243.5	2688.0	3060.0	3277.4	3605.1

Table 3-2-4-6 Vital capacity/weight (ml/kg)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>	
M	6	104	48.3	13.81	21.2	29.8	37.8	49.4	58.4	66.1	74.9	
	7	200	51.1	11.95	24.6	34.5	43.9	51.1	58.8	66.5	72.1	
	8	172	52.0	12.39	28.0	37.2	41.8	52.2	60.6	68.8	74.2	
	9	202	56.1	13.99	33.7	39.8	47.2	55.0	63.9	73.7	87.7	
	10	173	56.6	14.93	27.5	36.7	47.1	56.7	65.7	75.8	86.4	
	11	149	55.4	14.04	27.8	36.8	46.0	56.0	64.4	74.5	81.9	
	12	196	57.7	13.53	33.1	40.1	48.7	58.2	67.5	74.2	83.6	
	13	185	59.2	11.29	36.8	43.5	52.3	60.3	67.3	72.9	80.2	
	14	162	63.7	13.18	38.1	46.7	54.5	64.6	72.4	79.3	88.2	
	15	188	65.4	12.57	43.1	49.9	57.1	65.5	73.0	79.9	87.8	
	16	162	65.5	12.63	39.8	48.6	57.9	65.4	73.6	82.8	87.2	
	17	186	67.4	14.90	45.4	50.5	57.6	65.9	74.6	86.5	101.8	
	18	143	64.3	11.12	43.5	49.5	56.3	64.4	73.5	78.2	82.4	
	19	102	66.3	10.56	45.4	54.2	59.3	65.2	72.4	81.0	92.0	
	20	95	66.9	12.65	40.2	51.0	59.8	67.2	74.9	80.5	87.8	
	21	95	65.4	12.70	40.9	49.8	56.8	65.5	72.6	82.9	93.9	
	22	87	63.1	9.24	49.3	52.4	56.0	62.1	67.5	76.5	85.9	
	F	6	94	46.2	13.34	22.4	29.7	36.7	45.6	54.5	62.7	70.5
		7	158	48.9	10.33	27.6	33.8	42.5	50.1	55.5	61.3	68.0
		8	146	49.9	11.46	26.3	36.4	41.8	50.4	57.8	63.8	69.6
		9	155	52.4	12.56	29.4	36.7	43.4	52.1	61.4	68.7	79.5
		10	147	51.6	13.22	28.3	35.8	42.4	50.8	60.3	66.8	78.3
11		151	52.7	12.63	31.6	36.2	44.8	51.7	60.7	69.5	82.3	
12		175	51.7	11.60	28.2	37.0	43.4	52.3	59.3	64.9	75.3	
13		159	51.9	10.41	31.9	38.5	43.6	52.7	58.7	66.0	70.6	
14		176	53.0	11.42	30.5	39.6	47.1	53.2	59.6	67.1	72.4	
15		168	51.9	11.49	32.3	38.0	44.2	51.4	58.8	65.1	76.2	
16		187	51.5	10.24	30.3	38.7	44.4	51.7	58.7	63.7	72.3	
17		202	54.8	12.01	34.0	39.7	47.4	54.6	62.1	70.5	76.9	
18		186	53.1	9.59	33.2	39.8	47.6	52.8	59.2	67.0	71.4	
19		128	53.4	10.33	34.2	40.1	46.2	52.2	61.3	68.3	72.9	
20		99	53.9	11.34	32.6	38.0	47.1	54.2	61.0	67.7	74.9	
21		100	53.4	9.91	36.4	39.2	47.9	53.3	59.2	67.0	72.3	
22		93	53.2	11.50	28.9	38.4	46.0	53.5	62.7	67.6	73.0	

2.5. Physical Fitness

Table 3-2-5-1		50 m run (sec)										
Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>	
M	6	101	12.6	1.45	10.5	10.9	11.7	12.4	13.4	14.2	17.0	
	7	192	11.8	1.17	9.8	10.4	10.9	11.8	12.5	13.4	14.3	
	8	164	11.2	1.38	9.2	9.8	10.5	10.9	11.7	12.7	15.4	
	9	195	10.7	1.21	9.1	9.4	9.9	10.5	11.3	12.4	13.5	
	10	163	10.2	1.00	8.6	9.0	9.5	10.1	10.7	11.6	12.3	
	11	139	9.9	1.02	8.3	8.8	9.2	9.8	10.5	11.1	12.4	
	12	190	9.5	1.12	7.9	8.3	8.7	9.1	10.2	11.1	12.0	
	13	176	8.8	1.13	7.3	7.6	8.1	8.7	9.4	10.3	11.4	
	14	148	8.6	1.22	7.2	7.5	7.8	8.5	9.1	10.0	11.2	
	15	183	8.2	0.97	6.9	7.2	7.5	8.0	8.5	9.3	10.8	
	16	156	8.1	0.99	6.9	7.1	7.5	8.0	8.5	9.2	11.2	
	17	179	8.0	0.94	6.8	7.0	7.4	7.8	8.3	9.0	10.5	
	18	141	7.8	0.70	6.7	7.0	7.4	7.8	8.3	8.7	9.6	
	19	98	8.1	0.95	6.4	7.1	7.5	8.0	8.5	9.0	10.4	
	20	95	8.3	1.55	6.7	7.1	7.4	7.9	8.9	9.6	12.8	
	21	92	8.3	1.07	7.0	7.2	7.6	8.1	9.1	9.7	10.3	
	22	83	8.4	0.62	7.4	7.7	7.9	8.2	9.1	9.2	9.5	
	F	6	93	13.5	1.46	11.2	11.9	12.5	13.4	14.2	15.0	16.9
		7	155	12.5	1.37	10.5	11.0	11.6	12.2	13.2	13.8	15.6
		8	145	11.6	1.29	9.6	9.9	10.8	11.5	12.3	13.2	14.3
		9	151	11.2	1.17	9.4	9.8	10.2	11.1	12.0	12.6	13.9
		10	133	10.7	0.99	9.0	9.7	10.1	10.6	11.3	11.9	12.8
11		141	10.3	1.18	8.3	9.1	9.7	10.3	11.0	11.7	12.6	
12		171	10.2	1.40	8.5	8.9	9.3	9.9	10.7	12.0	13.1	
13		140	10.1	1.36	8.2	8.5	9.2	9.9	10.8	11.7	13.7	
14		160	10.0	1.23	8.3	8.6	9.2	9.7	10.5	11.6	13.1	
15		151	10.0	1.40	8.1	8.6	9.1	9.7	10.5	11.9	13.4	
16		180	9.7	0.90	8.0	8.7	9.2	9.7	10.2	10.9	11.8	
17		193	10.1	1.01	8.4	8.8	9.3	10.0	10.8	11.5	12.1	
18		172	10.1	1.29	8.4	8.7	9.3	9.9	10.4	11.2	13.6	
19		122	10.3	1.20	8.2	8.7	9.4	10.1	10.8	11.8	13.2	
20		91	10.2	1.04	8.5	9.0	9.5	10.1	10.8	11.4	12.7	
21		99	10.2	0.93	8.6	9.0	9.6	10.0	10.7	11.5	12.3	
22		93	10.2	1.43	8.1	8.8	9.5	10.1	10.7	11.9	13.8	

Table 3-2-5-2 Standing long jump (cm)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>	
M	6	104	105.5	16.03	75.5	86.0	95.0	107.0	115.8	125.0	133.9	
	7	200	112.0	17.82	77.1	90.0	101.0	111.0	123.0	137.7	149.0	
	8	171	121.9	19.76	86.2	98.0	111.0	123.0	135.0	145.8	160.5	
	9	202	129.5	20.52	92.0	100.0	117.0	130.0	144.3	155.0	165.9	
	10	173	137.2	19.87	99.4	111.0	123.0	139.0	152.5	163.0	173.3	
	11	148	147.0	21.25	105.9	119.0	135.0	147.0	160.0	173.1	186.5	
	12	195	152.4	24.01	109.8	120.0	134.0	152.0	170.0	183.0	194.0	
	13	184	166.6	28.02	118.1	128.0	144.0	168.0	187.0	205.0	215.9	
	14	161	178.1	29.21	122.9	140.2	155.5	176.0	200.0	217.8	229.1	
	15	188	184.9	30.20	121.7	142.9	166.0	189.0	207.8	224.1	235.0	
	16	161	193.2	31.26	129.0	147.4	173.0	193.0	214.0	233.4	248.6	
	17	186	198.0	30.79	135.8	155.0	177.8	201.0	220.3	236.0	248.4	
	18	143	201.3	29.69	133.6	156.4	186.0	200.0	219.0	237.6	251.0	
	19	102	203.7	26.31	145.5	167.3	189.8	205.0	225.0	234.0	247.0	
	20	96	207.6	28.90	151.6	171.7	184.5	212.0	230.0	240.3	258.4	
	21	95	202.0	24.37	143.8	166.6	190.0	208.0	219.0	227.4	235.1	
	22	87	197.5	23.78	157.9	169.0	182.0	194.0	214.0	231.0	255.2	
	F	6	94	92.0	12.92	73.0	76.0	84.5	91.0	99.3	107.0	119.3
		7	159	102.2	16.37	72.4	81.0	93.0	103.0	112.0	120.0	133.4
		8	146	112.9	15.97	86.4	91.7	101.8	112.0	124.3	132.2	145.2
		9	155	121.3	17.53	92.7	100.6	107.0	121.0	135.0	144.0	152.0
		10	146	127.7	17.92	96.2	105.4	113.0	128.5	140.0	150.3	163.5
11		151	130.5	18.87	97.6	107.0	116.0	129.0	144.0	154.8	170.0	
12		174	130.4	19.73	97.8	105.5	115.8	128.5	146.0	157.0	170.0	
13		159	131.9	22.45	88.8	102.0	118.0	132.0	145.0	160.0	183.2	
14		175	136.5	22.78	92.6	106.0	121.0	138.0	152.0	164.0	178.2	
15		166	136.0	21.61	100.0	107.7	118.0	136.0	151.3	167.0	176.0	
16		185	137.4	22.23	98.2	110.6	122.0	138.0	154.0	164.8	180.0	
17		202	135.5	22.40	96.0	109.6	121.0	132.0	149.0	166.0	182.9	
18		183	137.1	20.62	98.0	111.4	123.0	136.0	149.0	165.6	176.0	
19		127	139.4	21.35	99.8	108.8	125.0	139.0	153.0	166.0	180.0	
20		99	139.4	17.72	109.0	116.0	128.0	136.0	149.0	167.0	177.0	
21		100	145.1	18.12	117.0	123.0	128.5	146.0	157.0	168.0	179.8	
22		93	141.3	19.58	106.0	112.8	128.5	144.0	150.5	167.2	180.9	



Table 3-2-5-3 Vertical jump (cm)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	6	104	19.3	3.91	12.5	14.5	16.5	19.0	22.1	24.3	28.4
	7	201	21.1	4.17	14.7	16.3	18.0	20.8	23.4	25.8	30.1
	8	171	22.7	5.13	12.0	16.0	19.3	22.6	26.1	29.8	32.6
	9	202	24.3	5.40	15.3	17.7	20.7	24.1	27.8	31.0	36.3
	10	173	25.9	5.77	15.6	18.7	22.2	25.7	29.2	33.4	38.9
	11	149	27.4	5.84	16.6	20.1	23.6	27.6	31.1	34.9	39.0
	12	196	29.0	6.25	18.4	21.3	24.6	28.8	33.2	36.6	40.6
	13	185	33.6	8.28	19.5	23.0	27.2	33.0	39.7	45.6	49.3
	14	161	35.9	8.02	20.8	23.9	30.9	35.8	42.3	45.4	50.8
	15	188	37.9	7.77	23.4	27.7	32.8	38.4	43.2	47.2	51.1
	16	161	39.6	9.12	22.7	28.5	33.2	39.6	44.8	50.7	56.5
	17	186	41.7	8.22	26.8	30.1	36.6	41.5	46.9	52.1	58.9
	18	142	42.5	8.16	28.0	32.7	37.1	42.1	48.1	51.6	60.8
	19	102	42.1	7.87	28.4	32.1	36.4	41.8	47.4	53.4	57.0
	20	96	42.2	8.49	26.8	32.0	36.4	41.6	46.5	54.7	59.3
	21	95	40.3	6.05	28.3	31.9	35.8	40.3	44.9	48.1	49.9
	22	87	40.9	6.15	29.2	31.4	36.8	40.5	43.9	49.5	53.7
F	6	94	16.9	2.93	10.6	12.5	15.2	17.2	18.5	20.8	22.3
	7	159	19.5	3.88	12.5	14.7	17.0	18.9	21.6	24.9	27.9
	8	146	21.7	4.58	12.3	15.7	18.6	21.9	25.1	27.3	30.0
	9	155	22.7	5.04	13.4	16.6	18.9	23.2	26.6	28.2	32.6
	10	145	24.0	5.44	15.3	17.0	19.8	24.1	28.2	31.7	35.5
	11	150	24.4	5.42	15.1	18.0	20.6	24.4	28.0	31.8	36.4
	12	174	24.1	5.48	14.6	17.8	20.2	23.6	27.4	31.9	36.6
	13	159	25.0	5.12	14.9	18.2	22.3	24.9	28.1	31.1	34.7
	14	176	26.1	5.63	15.1	19.4	22.0	25.8	29.9	33.9	37.2
	15	168	25.8	5.84	15.3	18.0	22.4	25.6	29.9	33.0	36.8
	16	185	26.0	5.86	15.2	19.1	22.2	25.7	29.3	33.1	38.9
	17	203	25.4	5.73	15.0	18.4	21.4	24.8	28.9	32.5	38.3
	18	185	25.5	5.88	15.9	19.0	21.1	24.6	29.4	34.3	37.4
	19	128	25.8	5.30	17.6	18.7	21.9	25.4	28.7	33.4	38.3
	20	99	25.0	4.32	17.2	19.6	21.7	24.9	28.1	30.9	33.4
	21	100	25.5	4.48	17.5	20.6	22.2	25.4	27.6	30.8	35.3
	22	93	24.3	5.30	14.1	17.0	20.5	23.8	27.8	31.0	34.9

Table 3-2-5-4 Pull-ups with body inclined/Pull-ups/One-minute sit-ups (times)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>	
M	6	101	16.8	11.30	2.1	4.0	8.0	14.0	24.0	31.8	42.9	
	7	198	16.7	10.12	3.0	6.0	9.8	15.0	22.0	31.1	40.0	
	8	172	16.2	11.83	1.2	4.3	7.3	13.5	20.8	32.7	49.6	
	9	199	14.3	11.54	0.0	2.0	6.0	11.0	20.0	31.0	43.0	
	10	172	17.7	12.29	1.0	4.0	9.3	15.0	25.0	35.4	48.9	
	11	145	21.3	13.93	2.4	5.6	10.0	20.0	30.0	41.8	51.0	
	12	193	19.5	13.83	1.8	5.0	9.0	16.0	27.5	38.8	54.3	
	13	184	0.8	2.92	0.0	0.0	0.0	0.0	0.0	2.5	5.4	
	14	160	1.1	1.61	0.0	0.0	0.0	0.0	2.0	3.0	5.2	
	15	184	1.6	1.97	0.0	0.0	0.0	1.0	2.0	4.0	7.0	
	16	160	2.0	2.49	0.0	0.0	0.0	1.0	3.0	5.0	8.3	
	17	179	2.2	2.88	0.0	0.0	0.0	1.0	3.0	6.0	9.6	
	18	141	2.9	3.48	0.0	0.0	0.0	2.0	4.5	6.0	12.0	
	19	102	2.7	2.76	0.0	0.0	0.0	2.0	5.0	7.0	9.0	
	20	95	2.8	2.90	0.0	0.0	1.0	2.0	4.0	8.0	10.1	
	21	94	3.0	2.70	0.0	0.0	1.0	3.0	4.0	7.0	10.0	
	22	87	2.5	3.06	0.0	0.0	0.0	2.0	4.0	6.0	8.0	
	F	6	94	9.3	7.16	0.0	0.0	3.0	8.0	14.0	19.5	26.0
		7	159	13.7	7.97	0.0	3.0	7.0	13.0	20.0	24.0	27.2
		8	146	16.9	8.63	0.0	3.7	11.0	17.5	23.3	27.3	30.6
		9	155	18.6	9.02	1.0	4.0	13.0	20.0	25.0	30.0	34.0
		10	145	20.3	8.99	2.0	7.6	14.0	21.0	25.5	30.0	39.2
11		151	22.6	8.90	3.0	10.0	17.0	23.0	29.0	33.0	38.3	
12		174	23.9	7.20	8.5	16.0	20.0	23.0	29.0	33.0	38.8	
13		159	24.3	8.38	7.4	13.0	19.0	25.0	31.0	34.0	38.2	
14		175	25.1	7.97	11.0	14.0	20.0	25.0	31.0	35.0	39.7	
15		168	25.2	9.18	5.0	13.0	20.0	25.0	31.0	37.1	43.0	
16		186	25.6	8.78	6.6	15.0	19.0	26.5	32.0	35.3	42.0	
17		202	23.4	8.12	6.1	13.0	18.0	23.0	29.0	35.0	38.0	
18		185	23.7	8.23	5.0	13.0	19.0	24.0	30.0	33.0	38.4	
19		127	24.7	8.65	3.8	15.0	19.0	25.0	31.0	36.0	39.2	
20		98	25.4	7.82	12.0	14.9	20.0	27.0	31.0	35.1	40.0	
21		99	23.8	8.14	8.0	13.0	19.0	24.0	29.0	35.0	39.0	
22		92	21.9	9.78	4.0	8.0	16.0	21.0	29.0	36.0	40.1	

Note: Pull-ups with body inclined was for male aged 6~12; Pull-ups was for male aged 13~22; Sit-ups was for female aged 6~22.

Table 3-2-5-5 Grip strength (kg)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	6	104	7.7	1.83	3.8	5.2	6.5	7.7	8.9	10.1	11.8
	7	201	9.3	2.15	5.6	6.4	7.8	9.1	10.7	12.6	13.7
	8	172	10.4	3.16	5.7	6.7	8.4	10.3	11.8	13.6	17.8
	9	202	11.9	2.81	7.1	7.8	10.0	11.8	13.7	15.7	17.5
	10	173	13.5	3.01	7.5	9.5	11.5	13.4	15.8	17.4	19.4
	11	149	16.4	4.11	9.6	11.3	13.2	16.4	19.5	21.7	24.3
	12	196	19.7	5.25	11.9	13.2	15.3	19.3	23.0	26.6	31.3
	13	185	24.1	5.69	13.5	16.7	19.7	24.7	28.7	31.2	34.2
	14	162	27.7	6.07	15.0	20.4	24.0	27.9	31.6	35.6	40.3
	15	187	30.4	6.37	17.8	22.0	26.2	30.4	34.1	37.7	43.6
	16	162	32.9	6.44	20.2	24.7	28.3	33.0	37.1	41.0	45.8
	17	185	34.7	6.56	22.3	26.4	30.6	34.0	39.2	43.3	47.8
	18	143	36.2	6.67	23.8	28.1	31.6	35.5	40.2	45.5	50.3
	19	102	37.9	6.64	24.6	28.6	33.2	38.9	42.5	46.3	50.5
	20	96	38.9	5.53	27.2	32.3	35.8	39.1	42.1	46.6	51.1
	21	95	42.5	6.43	29.9	33.8	38.4	42.5	46.7	51.5	53.3
	22	87	40.9	5.57	30.1	33.6	36.8	41.2	45.5	47.9	49.3
F	6	94	7.0	1.80	3.3	4.6	5.8	6.7	8.4	9.1	11.3
	7	159	8.1	2.07	4.6	5.6	6.8	8.0	9.2	11.2	12.8
	8	145	9.7	2.39	5.8	7.1	7.9	9.6	11.1	12.4	14.6
	9	155	11.1	2.75	6.4	8.2	9.0	10.9	13.0	14.6	17.1
	10	147	13.4	3.19	7.7	9.6	11.2	13.3	15.3	17.5	19.3
	11	150	15.7	3.53	9.9	11.1	13.0	15.1	18.2	20.8	22.5
	12	175	17.5	4.18	9.4	12.7	14.8	17.1	20.3	23.1	26.6
	13	159	18.7	4.44	10.2	13.1	16.0	18.7	21.2	24.7	27.9
	14	176	20.0	4.74	11.3	14.4	16.8	19.5	22.8	25.4	31.2
	15	168	20.6	4.36	12.9	15.0	17.6	20.4	23.9	26.3	29.7
	16	187	20.6	4.30	12.0	14.9	17.7	20.7	23.7	26.1	28.7
	17	203	21.7	3.60	15.0	17.3	19.3	21.9	24.0	26.2	28.4
	18	186	21.8	3.95	15.4	17.1	19.0	21.4	24.2	27.5	29.6
	19	128	22.0	4.08	15.1	17.5	18.6	21.3	24.8	28.0	30.4
	20	99	22.1	4.72	13.9	16.2	19.0	21.6	25.4	28.5	31.4
	21	100	22.5	4.39	14.5	16.8	19.0	22.3	25.9	29.0	30.3
	22	93	22.7	4.71	14.3	16.0	20.0	22.4	25.8	28.4	31.2

Table 3-2-5-6 Back strength (kg)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>	
M	6	103	24.0	7.75	10.1	15.0	19.0	24.0	28.0	34.0	44.0	
	7	201	27.4	7.97	14.1	17.0	21.5	27.0	32.0	38.0	45.0	
	8	172	30.7	8.31	18.0	21.0	24.0	30.0	35.8	41.0	46.8	
	9	202	34.3	9.56	17.1	22.0	28.0	33.5	41.0	47.0	52.8	
	10	173	38.6	9.23	23.2	28.4	32.0	37.0	45.5	52.0	58.0	
	11	149	44.9	13.51	25.0	28.0	34.5	44.0	52.5	59.0	73.0	
	12	196	52.6	14.76	27.0	35.0	42.0	51.0	61.8	72.0	85.2	
	13	185	64.5	17.36	33.0	42.0	52.0	65.0	75.0	84.0	101.7	
	14	162	74.5	19.74	40.6	50.3	61.0	72.5	86.0	100.0	115.4	
	15	187	79.9	20.31	41.0	56.0	66.0	80.0	91.0	109.0	120.1	
	16	161	86.7	19.67	54.0	63.0	73.5	85.0	99.5	112.8	128.4	
	17	186	91.9	19.93	52.6	68.4	80.0	91.0	104.0	116.3	133.2	
	18	143	95.5	22.24	53.3	70.4	79.0	94.0	110.0	124.2	135.7	
	19	102	98.5	19.70	63.4	77.0	84.8	97.0	108.0	128.0	147.6	
	20	96	100.3	17.66	61.6	78.5	88.3	101.0	111.8	123.6	133.0	
	21	95	108.9	22.06	63.0	76.4	96.0	110.0	126.0	139.4	150.1	
	22	87	104.8	16.93	71.6	79.0	95.0	106.0	118.0	127.2	133.9	
	F	6	94	19.7	6.11	10.9	13.0	15.8	19.0	23.0	28.0	38.0
		7	159	22.2	6.11	11.8	14.0	18.0	22.0	26.0	30.0	35.4
		8	146	25.9	7.68	14.4	16.0	20.0	25.0	31.0	36.3	44.6
		9	155	30.7	10.05	14.7	18.0	23.0	30.0	36.0	45.0	50.3
		10	147	33.1	10.37	16.4	21.0	26.0	31.0	39.0	46.2	55.0
11		151	38.5	10.02	21.6	25.0	31.0	38.0	46.0	51.8	57.0	
12		175	41.4	11.50	23.3	26.0	33.0	41.0	48.0	57.0	66.7	
13		158	44.9	14.33	20.3	25.9	36.0	43.5	53.0	63.0	76.5	
14		176	47.2	13.59	20.3	30.0	39.0	47.0	54.0	62.3	77.0	
15		169	47.9	11.91	24.2	33.0	41.0	47.0	55.0	61.0	72.9	
16		186	49.0	12.79	27.2	33.0	39.0	48.5	58.0	65.3	72.8	
17		203	50.7	12.55	28.2	35.4	42.0	49.0	60.0	65.6	76.0	
18		186	50.7	12.44	30.6	35.0	41.0	49.0	60.0	68.0	75.0	
19		128	53.6	13.21	30.4	38.0	44.0	52.5	62.0	71.1	77.5	
20		99	50.9	12.09	29.0	35.0	41.0	50.0	60.0	66.0	78.0	
21		100	53.9	14.16	27.0	35.0	43.3	53.5	65.8	72.0	75.0	
22		93	55.7	13.73	31.6	38.2	46.5	56.0	64.0	71.2	88.2	

Table 3-2-5-7 Endurance run (sec)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>	
M	6	101	152.8	25.29	121.5	130.2	138.1	147.3	160.8	179.2	249.7	
	7	188	147.3	18.89	117.8	125.5	134.5	144.1	156.8	174.6	195.9	
	8	161	146.6	22.56	119.0	122.7	130.7	141.4	159.3	174.8	200.6	
	9	190	138.5	19.22	108.6	115.6	122.7	137.5	149.1	163.9	180.5	
	10	162	131.9	19.02	103.8	112.5	119.0	128.0	140.7	157.2	178.2	
	11	138	127.4	19.57	98.2	105.3	113.1	125.3	138.0	153.6	174.4	
	12	189	119.2	23.53	94.1	98.9	106.4	114.7	126.6	144.1	163.5	
	13	174	333.1	68.71	238.8	253.3	292.1	322.1	361.3	414.9	527.0	
	14	146	316.0	60.41	233.7	245.8	270.7	304.4	353.1	417.5	452.6	
	15	182	298.2	50.04	216.2	242.5	261.3	292.6	328.0	356.6	402.7	
	16	153	289.8	48.07	219.3	238.8	253.7	279.9	316.1	352.7	412.9	
	17	178	294.0	54.11	218.5	233.2	256.5	285.7	322.4	367.5	416.2	
	18	140	288.5	49.39	221.5	237.9	257.1	278.5	312.6	349.0	410.0	
	19	98	293.6	45.28	213.0	242.1	264.3	289.4	319.3	349.4	378.9	
	20	95	286.6	38.80	210.5	241.2	262.4	290.2	304.5	321.8	368.6	
	21	91	296.0	39.93	234.8	243.3	272.5	291.5	318.2	356.3	384.1	
	22	81	311.2	39.69	232.7	259.7	287.6	311.7	331.4	360.8	407.5	
	F	6	89	159.2	14.24	129.9	143.2	150.2	158.6	166.6	177.1	193.7
		7	152	152.1	18.62	126.6	133.3	139.3	150.0	162.8	172.9	188.0
		8	145	147.3	22.70	119.3	127.3	133.3	141.9	156.2	171.7	187.2
		9	151	142.9	24.87	116.6	121.9	128.8	139.5	151.2	165.8	181.2
		10	133	136.1	19.85	104.8	115.2	123.0	131.9	146.7	160.1	182.6
11		140	128.3	15.32	105.5	110.3	118.6	126.5	135.8	149.2	164.3	
12		170	129.1	16.73	106.2	110.8	117.3	125.8	136.9	153.3	168.6	
13		139	295.0	40.76	227.3	241.2	266.4	293.4	322.4	348.0	373.7	
14		160	281.3	43.98	208.0	233.0	252.2	278.4	300.8	335.2	396.6	
15		150	283.7	34.91	223.0	241.2	258.4	281.6	308.9	333.1	357.6	
16		179	280.6	33.29	218.6	239.8	259.0	280.3	301.0	319.6	348.0	
17		190	285.3	36.02	221.5	241.2	259.7	281.1	306.2	333.0	362.9	
18		172	288.2	38.42	232.3	242.0	261.4	284.4	307.6	340.7	383.5	
19		120	286.7	36.64	228.4	244.6	262.2	285.0	301.1	338.2	361.6	
20		91	288.7	36.79	230.2	251.7	261.5	284.9	308.4	340.6	388.8	
21		99	287.4	29.65	235.8	250.5	265.6	289.6	303.7	328.1	361.1	
22		93	284.9	34.09	227.0	241.2	260.1	280.0	310.3	332.1	361.4	

Note: 50 m x 8 shuttle run was for subjects aged 6~12; 800 m run was for female aged 13~22; 1000 m run was for male aged 13~22.

Table 3-2-5-8 Sit and reach (cm)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>	
M	6	103	4.8	5.75	-5.2	-2.6	0.7	4.3	8.8	13.4	15.0	
	7	200	4.5	6.09	-7.5	-4.0	0.2	5.1	9.3	12.5	15.2	
	8	172	3.5	6.20	-10.4	-3.8	-0.4	3.4	7.6	11.1	15.7	
	9	201	2.0	6.94	-11.6	-7.6	-2.4	2.4	6.6	11.6	15.7	
	10	173	0.5	6.78	-13.8	-8.4	-4.7	0.9	5.1	8.7	13.0	
	11	149	0.4	7.24	-14.3	-8.5	-4.7	0.2	6.2	9.8	13.9	
	12	196	0.1	6.88	-13.4	-8.8	-4.9	0.3	5.3	8.4	11.2	
	13	185	2.0	8.43	-13.5	-8.9	-4.6	2.3	8.7	12.6	17.9	
	14	162	2.9	8.14	-11.9	-7.0	-3.5	3.4	8.3	12.6	19.6	
	15	188	3.7	8.59	-11.7	-7.6	-3.1	3.6	9.5	15.9	20.0	
	16	162	5.1	8.67	-13.1	-8.0	0.1	5.7	10.9	15.8	21.5	
	17	183	4.9	9.20	-13.0	-8.5	-0.6	4.7	12.5	16.9	21.9	
	18	143	6.3	8.80	-13.7	-5.3	0.6	6.8	12.2	17.0	20.5	
	19	102	4.5	9.10	-16.7	-8.0	-1.2	4.7	11.0	16.7	20.1	
	20	95	4.1	7.89	-9.8	-6.6	-2.4	4.2	9.8	14.8	20.2	
	21	95	2.7	8.33	-12.1	-8.7	-4.2	3.9	7.8	10.7	23.8	
	22	87	5.8	7.74	-10.8	-6.4	2.5	7.4	11.6	13.4	18.4	
	F	6	94	6.8	5.13	-2.9	1.2	3.1	6.4	11.1	14.3	16.2
		7	159	7.3	5.06	-2.6	0.7	3.7	7.7	11.0	13.6	16.0
		8	146	6.8	6.08	-8.3	-0.6	3.2	7.5	11.0	13.8	17.9
		9	155	5.4	7.03	-8.9	-3.3	0.2	5.4	10.6	14.2	18.0
		10	147	4.4	7.04	-9.8	-6.3	0.4	4.6	9.4	13.0	18.1
11		151	4.1	7.16	-11.2	-4.7	-0.7	4.1	9.1	13.1	15.6	
12		175	5.6	8.06	-10.4	-5.7	0.2	5.5	10.7	16.1	21.4	
13		159	6.9	8.08	-11.4	-2.2	2.2	6.9	12.6	18.1	21.6	
14		176	6.8	7.95	-9.5	-5.3	1.8	7.7	12.8	15.9	21.1	
15		168	8.7	8.84	-9.8	-3.3	2.6	8.6	15.8	18.9	24.4	
16		186	6.6	9.96	-11.6	-7.6	-1.9	7.6	14.0	18.7	22.9	
17		203	7.2	8.64	-9.1	-4.0	0.3	7.3	13.3	19.0	23.9	
18		185	8.1	8.66	-11.8	-3.7	2.8	9.0	14.3	18.2	24.1	
19		128	6.8	9.25	-13.6	-7.3	0.9	7.8	12.8	18.7	23.0	
20		97	7.8	8.50	-10.4	-3.8	2.3	8.9	14.6	18.4	21.9	
21		100	6.6	9.36	-16.3	-5.6	0.5	7.4	12.9	18.1	23.1	
22		93	5.1	8.49	-14.0	-6.9	-0.1	6.8	11.8	15.5	18.4	

Table 3-2-5-9 Respond time (sec)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	6	104	0.57	0.070	0.45	0.48	0.53	0.56	0.60	0.67	0.72
	7	201	0.54	0.071	0.42	0.45	0.48	0.53	0.58	0.63	0.69
	8	172	0.49	0.092	0.39	0.42	0.45	0.48	0.52	0.59	0.63
	9	202	0.45	0.055	0.36	0.38	0.41	0.45	0.49	0.53	0.57
	10	173	0.44	0.053	0.35	0.38	0.40	0.43	0.46	0.50	0.52
	11	149	0.42	0.055	0.33	0.36	0.38	0.41	0.45	0.48	0.54
	12	196	0.41	0.056	0.32	0.35	0.38	0.40	0.44	0.48	0.53
	13	184	0.41	0.049	0.34	0.35	0.38	0.41	0.43	0.48	0.52
	14	162	0.40	0.053	0.31	0.33	0.36	0.39	0.43	0.47	0.51
	15	188	0.39	0.047	0.31	0.33	0.36	0.38	0.41	0.45	0.48
	16	162	0.38	0.047	0.30	0.32	0.34	0.37	0.40	0.44	0.48
	17	186	0.37	0.047	0.30	0.32	0.34	0.37	0.39	0.44	0.48
	18	143	0.38	0.046	0.31	0.32	0.35	0.38	0.41	0.44	0.47
	19	101	0.39	0.056	0.26	0.33	0.35	0.39	0.41	0.44	0.53
20	96	0.39	0.050	0.32	0.34	0.35	0.38	0.41	0.45	0.52	
21	95	0.40	0.059	0.31	0.33	0.36	0.40	0.43	0.47	0.56	
22	87	0.40	0.033	0.32	0.36	0.38	0.40	0.41	0.43	0.47	
F	6	93	0.62	0.088	0.47	0.51	0.56	0.62	0.67	0.75	0.79
	7	159	0.56	0.072	0.44	0.47	0.51	0.56	0.59	0.65	0.72
	8	146	0.51	0.066	0.41	0.44	0.46	0.52	0.55	0.59	0.65
	9	155	0.48	0.052	0.38	0.41	0.44	0.47	0.52	0.55	0.58
	10	147	0.47	0.054	0.38	0.41	0.43	0.46	0.50	0.54	0.59
	11	151	0.45	0.054	0.36	0.39	0.41	0.45	0.48	0.53	0.57
	12	175	0.45	0.055	0.36	0.38	0.41	0.45	0.47	0.52	0.57
	13	158	0.44	0.052	0.35	0.38	0.41	0.44	0.48	0.51	0.56
	14	176	0.43	0.054	0.34	0.37	0.40	0.43	0.47	0.50	0.55
	15	169	0.42	0.050	0.34	0.36	0.38	0.41	0.45	0.49	0.52
	16	187	0.43	0.059	0.33	0.37	0.39	0.43	0.46	0.49	0.53
	17	203	0.42	0.048	0.33	0.36	0.39	0.42	0.45	0.49	0.53
	18	186	0.44	0.056	0.35	0.37	0.40	0.43	0.47	0.52	0.55
	19	128	0.44	0.062	0.33	0.36	0.40	0.44	0.47	0.51	0.55
20	99	0.43	0.063	0.33	0.35	0.38	0.43	0.48	0.51	0.56	
21	100	0.43	0.056	0.34	0.36	0.39	0.41	0.46	0.50	0.56	
22	93	0.43	0.056	0.31	0.36	0.39	0.43	0.45	0.51	0.54	

Table 3-2-5-10 One foot stands with eyes closed (sec)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	6	104	14.5	14.51	2.2	5.0	6.0	10.0	17.8	31.0	57.9
	7	201	14.5	10.61	3.0	5.0	8.0	12.0	18.0	26.0	41.9
	8	172	16.4	17.45	3.0	4.0	7.0	12.0	18.8	30.0	67.4
	9	202	19.2	19.41	4.0	5.0	8.0	15.0	22.0	41.4	62.8
	10	173	21.6	24.27	4.0	6.0	9.5	14.0	26.0	46.6	92.2
	11	148	31.9	31.18	4.5	9.0	14.0	23.5	39.8	63.1	125.6
	12	196	30.2	30.65	4.9	7.0	12.0	19.0	35.0	66.9	119.5
	13	185	36.5	37.20	4.0	7.0	14.0	22.0	45.5	86.6	149.9
	14	162	42.2	50.42	4.9	8.0	13.0	23.0	47.0	101.9	184.3
	15	188	51.0	60.98	3.0	7.0	13.0	31.5	62.5	114.4	228.0
	16	161	45.9	48.23	4.9	7.2	14.0	28.0	60.5	110.6	180.0
	17	186	48.9	49.07	4.0	7.0	16.0	32.5	57.5	122.4	188.2
	18	143	60.5	67.25	5.3	8.4	17.0	36.0	74.0	159.0	240.6
	19	102	56.5	45.97	5.2	14.0	25.8	45.0	67.5	125.5	180.9
20	96	54.6	50.13	4.9	9.0	18.3	39.0	72.8	131.8	186.7	
21	95	62.7	58.29	6.6	13.6	26.0	46.0	85.0	129.6	280.6	
22	87	52.1	53.15	5.6	7.8	18.0	34.0	68.0	121.0	235.8	
F	6	94	14.7	15.86	2.9	4.0	6.0	10.0	16.0	32.0	45.2
	7	159	16.4	14.28	3.0	4.0	7.0	12.0	22.0	34.0	49.4
	8	146	22.5	22.46	3.4	5.7	8.0	15.5	28.0	46.5	80.4
	9	155	22.7	21.50	3.7	6.0	10.0	16.0	29.0	44.4	69.9
	10	146	29.3	41.21	3.4	6.7	10.0	18.0	31.3	63.9	105.0
	11	150	27.7	30.45	3.5	6.1	9.8	18.0	34.0	60.9	102.0
	12	174	31.7	35.77	3.0	7.0	11.0	18.0	39.0	75.5	135.3
	13	159	36.7	36.83	5.0	8.0	13.0	22.0	50.0	85.0	165.0
	14	176	41.0	44.20	4.3	7.0	14.0	26.0	51.8	87.6	192.4
	15	169	44.6	51.10	6.0	9.0	16.0	26.0	51.5	98.0	197.0
	16	187	42.5	46.15	3.0	6.8	13.0	23.0	56.0	108.0	179.4
	17	203	42.2	50.68	5.1	9.0	15.0	27.0	51.0	77.0	204.0
	18	186	54.7	56.83	2.6	7.0	13.8	32.0	77.0	140.6	200.4
	19	128	60.5	60.71	5.0	10.0	19.3	38.0	77.0	166.3	227.0
20	99	53.7	62.23	4.0	7.0	15.0	29.0	73.0	121.0	217.0	
21	100	58.3	56.77	5.1	12.0	18.0	36.0	82.0	147.8	235.7	
22	93	55.8	51.57	7.0	11.4	21.0	38.0	64.5	154.4	180.7	



2.6. Health

Table 3-2-6-1 Primary teeth decay (%)

Gender	Age group (years)	Subjects (n)	Decayed primary teeth (d)	Decayed primary teeth filled (f)	Decayed primary teeth loss (m)	Primary teeth decayed, filled and loss (dmf)	
M	6	104	52.9	15.4	2.9	58.7	
	7	201	63.2	27.9	4.0	70.6	
	8	172	61.0	21.5	4.1	66.3	
	9	202	65.3	28.7	4.0	74.3	
	10	173	54.3	23.7	0.6	61.3	
	11	149	28.9	7.4	1.3	30.9	
	12	196	13.8	5.1	0.5	16.8	
	13	185	9.7	1.6	0.0	10.3	
	14	162	4.3	1.9	0.0	6.2	
	15	188	0.0	0.0	0.0	0.0	
	16	162	0.0	0.0	0.0	0.0	
	17	186	0.0	0.0	0.0	0.0	
	18	143	0.0	0.0	0.0	0.0	
	F	6	94	54.3	18.1	4.3	57.4
		7	159	64.8	17.0	5.0	69.2
		8	146	71.9	34.9	5.5	81.5
		9	155	60.6	24.5	3.9	69.0
		10	147	38.1	15.6	0.0	43.5
11		151	21.9	10.6	0.0	28.5	
12		175	8.0	2.3	0.6	9.7	
13		159	5.0	0.0	0.0	5.0	
14		176	4.0	0.6	0.0	4.6	
15		169	0.0	0.0	0.0	0.0	
16		187	0.0	0.0	0.0	0.0	
17		203	0.0	0.0	0.0	0.0	
18		186	0.0	0.0	0.0	0.0	

Table 3-2-6-2 Permanent teeth decay (%)

Gender	Age group (year)	Subjects (n)	Decayed permanent teeth (D)	Decayed permanent teeth filled (F)	Decayed permanent teeth loss (M)	Permanent teeth decayed, filled and loss (DMF)
M	6	104	2.9	0.0	0.0	2.9
	7	201	9.5	4.0	0.0	11.4
	8	172	23.8	6.4	0.0	28.5
	9	202	18.3	10.4	0.0	25.2
	10	173	22.0	16.2	0.0	32.9
	11	149	25.5	18.8	1.3	40.3
	12	196	27.6	22.4	0.5	45.9
	13	185	40.5	26.5	1.1	54.6
	14	162	46.3	23.5	1.9	55.6
	15	188	47.9	26.6	1.1	60.6
	16	162	38.9	34.0	1.2	59.9
	17	186	43.5	39.8	1.6	64.5
	18	143	37.8	35.7	2.8	58.7
F	6	94	1.1	0.0	0.0	1.1
	7	159	14.5	6.9	0.0	20.1
	8	146	21.2	6.8	0.7	26.0
	9	155	25.2	14.8	0.0	34.2
	10	147	29.9	12.9	0.0	36.7
	11	151	30.5	23.2	0.0	47.0
	12	175	36.6	25.7	3.4	53.1
	13	159	45.3	27.0	1.3	59.7
	14	176	51.7	34.1	2.8	68.8
	15	169	50.3	43.2	2.4	70.4
	16	187	41.7	49.2	1.1	73.8
	17	203	48.3	42.9	2.5	71.9
	18	186	46.2	48.4	4.3	76.9

Table 3-2-6-3 Poor eyesight & near eyesight (%)

Gender	Age group (year)	Subjects (n)	Poor eyesight	Mild – poor	Moderate – poor	Severe – poor	Near eyesight
M	6	104	46.2	22.1	12.5	11.5	25.0
	7	201	50.7	13.9	16.9	19.9	31.3
	8	172	58.7	15.1	19.8	23.8	41.9
	9	202	61.9	13.9	20.3	27.7	45.5
	10	173	71.5	11.0	23.8	36.6	50.3
	11	149	70.5	8.7	19.5	42.3	49.0
	12	196	75.0	6.1	20.4	48.5	62.8
	13	184	74.5	9.2	15.2	50.0	59.8
	14	161	73.3	7.5	13.7	52.2	62.1
	15	188	79.3	4.3	17.0	58.0	64.9
	16	162	74.7	4.9	16.0	53.7	59.3
	17	185	76.8	4.3	9.7	62.7	62.7
	18	143	69.9	4.2	9.1	56.6	53.8
	19	102	80.4	3.9	10.8	65.7	65.7
	20	96	86.5	5.2	14.6	66.7	74.0
	21	95	72.6	2.1	29.5	41.1	62.1
	22	87	72.4	3.4	25.3	43.7	66.7
F	6	94	38.3	18.1	13.8	6.4	20.2
	7	159	54.7	15.7	22.0	17.0	38.4
	8	146	60.3	11.6	26.0	22.6	44.5
	9	155	68.4	13.5	21.3	33.5	49.7
	10	147	65.3	12.9	15.6	36.7	52.4
	11	151	72.8	9.9	12.6	50.3	53.6
	12	175	77.7	5.7	17.1	54.9	59.4
	13	159	75.5	4.4	20.8	50.3	63.5
	14	176	82.4	6.3	16.5	59.7	67.0
	15	168	86.3	7.7	16.1	62.5	67.3
	16	187	82.9	3.7	16.0	63.1	61.5
	17	203	83.7	6.4	13.3	64.0	66.0
	18	186	80.5	3.8	13.5	63.2	62.9
	19	128	82.0	3.1	11.7	67.2	71.9
	20	99	82.8	3.0	16.2	63.6	71.7
	21	96	84.4	4.2	8.3	71.9	77.1
	22	89	86.5	1.1	18.0	67.4	73.0

Table 3-2-6-4 Color vision (%)

Gender	Age group(year)	Subjects (n)	Color vision deficiency
M	6	104	11.5
	7	198	15.7
	8	171	28.7
	9	202	15.8
	10	173	8.1
	11	149	6.0
	12	196	9.2
	13	184	7.6
	14	161	8.1
	15	187	5.9
	16	161	6.2
	17	186	5.9
	18	142	4.2
	19	102	2.9
F	20	96	6.3
	21	94	17.0
	22	87	4.6
	6	93	7.5
	7	159	23.3
	8	146	18.5
	9	155	9.7
	10	147	6.1
	11	151	4.0
	12	175	3.4
	13	159	3.8
	14	176	1.7
	15	168	3.0
	16	187	2.1
17	203	2.0	
18	185	0.5	
19	128	0.0	
20	98	0.0	
21	96	1.0	
22	90	0.0	

### 3. Adults

#### 3.1. Basic Information of the Subjects

**Table 3-3-1-1 Distribution of sampling sites (organizations)**

Sampling sites	Names	M		F		Total	
		Subjects (n)	Percentage (%)	Subjects (n)	Percentage (%)	Subjects (n)	Percentage (%)
Government Agency	Department of Health	80	5.1	103	5.2	183	5.2
	Education and Youth Affairs Bureau	75	4.8	197	10.0	272	7.7
	Macao Government Tourist Office	17	1.1	39	2.0	56	1.6
	Statistics and Census Bureau	44	2.8	38	1.9	82	2.3
	Macao Sport Development Board	104	6.7	45	2.3	149	4.2
	Civic and Municipal Affairs Bureau	102	6.5	87	4.4	189	5.3
	Port Authority	130	8.3	12	0.6	142	4.0
	Social Welfare Institute	14	0.9	33	1.7	47	1.3
	Land, Public Works and Transport Bureau	29	1.9	38	1.9	67	1.9
	Labour Affairs Bureau	27	1.7	26	1.3	53	1.5
	<b>Total</b>	<b>622</b>	<b>39.8</b>	<b>618</b>	<b>31.3</b>	<b>1240</b>	<b>35</b>
Private agency / group	Escola Estrela do Mar and Southeast School	14	0.9	16	0.8	30	0.8
	Tai Fung Bank Limited	6	0.4	8	0.4	14	0.4
	Future Bright Group	17	1.1	17	0.9	34	1.0
	Caltex Oil (Macao) Ltd.	5	0.3	3	0.2	8	0.2
	CEM-Macao Electricity Company, Ltd.	25	1.6	16	0.8	41	1.2
	Xin Kang Heng Holdings Ltd.	8	0.5	2	0.1	10	0.3
	MPI-Gaming Teaching & Research Centre	23	1.5	25	1.3	48	1.4
	The Women's Association of Macau	3	0.2	75	3.8	78	2.2
	Macao New Chinese Youth Association	40	2.6	1	0.1	41	1.2
	Galaxy Casino, S.A.	73	4.7	114	5.8	187	5.3
	Kiang Wu Nursing College	1	0.1	3	0.2	4	0.1
	Others	277	17.7	551	27.8	828	23.4
	Venetian Macau, S.A.	54	3.5	73	3.7	127	3.6
	Volunteers Association	28	1.8	23	1.2	51	1.4
	Beneficência Sun Tou Tong de Macau, Sociedade de	92	5.9	139	7.0	231	6.5
	União Geral das Associações dos Moradores de Macau	52	3.3	61	3.1	113	3.2
	Macao Federation of Trade Unions	70	4.5	82	4.1	152	4.3
	Melco Crown Entertainment Co., Ltd.	46	2.9	57	2.9	103	2.9
	Bank of China Macao Branch	68	4.4	50	2.5	118	3.3
	WingHang Bank	10	0.6	6	0.3	16	0.5
	The Red Cross of Macao Special Administrative Region	9	0.6	6	0.3	15	0.4
The University of Macau	18	1.2	33	1.7	51	1.4	
<b>Total</b>	<b>939</b>	<b>60.3</b>	<b>1361</b>	<b>69</b>	<b>2300</b>	<b>65</b>	

**Table 3-3-1-2** **Distribution of occupations**

Occupation	M				F			
	Subjects (n)	Percentage (%)	Non-Labour workers	Labour workers	Subjects (n)	Percentage (%)	Non-Labour workers	Labour workers
Legislative officers, public administration officers, community directors or managers	47	3.0	46	1	32	1.6	32	0
Professionals	192	12.3	192	0	193	9.8	193	0
Technicians or professional assistants	270	17.3	152	118	372	18.8	143	229
Office clerks	236	15.1	235	1	460	23.2	460	0
<b>Total</b>	<b>745</b>	<b>47.7</b>	<b>625</b>	<b>120</b>	<b>1057</b>	<b>53.4</b>	<b>828</b>	<b>229</b>
Customer service or salesmen	246	15.8	0	246	314	15.9	0	314
Experienced workers in agricultural and fishery fields	13	0.8	0	13	5	0.3	0	5
Artisan or handicraftsmen	49	3.1	0	49	11	0.6	0	11
Machine operators, drivers or assemblers	150	9.6	0	150	4	0.2	0	4
Non-technicians	93	6.0	0	93	117	5.9	0	117
Others	220	14.1	126	94	218	11.0	118	100
Unemployed	39	2.5	27	12	47	2.4	35	12
Household duties	6	0.4	0	6	205	10.4	0	205
<b>Total</b>	<b>816</b>	<b>52.3</b>	<b>153</b>	<b>663</b>	<b>921</b>	<b>46.7</b>	<b>153</b>	<b>768</b>

**Table 3-3-1-3** **Residential distribution of workers (%)**

Gender	Communities	Labour workers	Non labour workers	Total
M	S.Francisco	0.6	0.8	<b>0.7</b>
	Na.Sra.do Carmo	10.6	24.2	<b>17.4</b>
	S.Lourenço	12.2	10.3	<b>11.2</b>
	Sé Catedral	6.0	10.7	<b>8.3</b>
	S.António	22.7	21.9	<b>22.3</b>
	S.Lázaro	5.6	8.4	<b>7.0</b>
	Na.Sra.de Fátima	42.3	23.9	<b>33.1</b>
F	S.Francisco	0.2	0.5	<b>0.4</b>
	Na.Sra.do Carmo	14.7	21.5	<b>18.0</b>
	S.Lourenço	9.1	8.8	<b>8.9</b>
	Sé Catedral	7.7	9.5	<b>8.6</b>
	S.António	23.5	22.3	<b>22.9</b>
	S.Lázaro	6.2	11.3	<b>8.7</b>
	Na.Sra.de Fátima	38.6	26.2	<b>32.4</b>

**Table 3-3-1-4 Birth place (%)**

Gender	Place of Birth	Aged	Aged	Aged	Aged	Aged	Aged	Aged	Aged	Total
		20~24	25~29	30~34	35~39	40~44	45~49	50~54	55~59	
M	Mainland	20.3	14.4	32.8	43.1	25.8	35.7	37.6	48.2	<b>32.3</b>
	Macao	73.8	75.6	54.9	47.9	52.8	57.3	51.8	42.0	<b>57.0</b>
	Hong Kong	4.8	10.0	10.3	5.3	8.4	2.0	2.3	1.6	<b>5.5</b>
	Portugal	0.0	0.0	0.0	1.6	1.7	1.0	1.4	1.0	<b>0.8</b>
	Others	1.1	0.0	2.1	2.1	11.2	4.0	6.9	7.3	<b>4.3</b>
F	Mainland	18.9	20.2	40.0	49.1	48.3	46.1	48.5	44.6	<b>41.0</b>
	Macao	80.1	73.1	51.5	43.5	43.3	46.4	42.9	42.0	<b>51.2</b>
	Hong Kong	1.0	6.7	5.0	2.6	2.3	2.2	2.1	5.4	<b>3.2</b>
	Portugal	0.0	0.0	2.0	0.9	1.5	0.3	0.3	0.9	<b>0.7</b>
	Others	0.0	0.0	1.5	3.9	4.6	5.0	6.2	7.1	<b>3.9</b>

**Table 3-3-1-5 Education (%)**

Gender	Education	Aged	Aged	Aged	Aged	Aged	Aged	Aged	Aged	Total
		20~24	25~29	30~34	35~39	40~44	45~49	50~54	55~59	
M	Below primary school level	1.1	1.0	0.0	0.5	1.7	2.5	8.2	9.3	<b>3.1</b>
	Primary school	2.7	3.0	1.5	3.7	9.6	15.1	26.9	27.5	<b>11.5</b>
	Secondary school	38.0	24.9	22.1	33.3	42.1	54.3	45.7	54.4	<b>39.4</b>
	Professional college and university	56.1	65.2	63.1	50.8	28.1	20.6	12.8	6.7	<b>37.6</b>
	Master	2.1	6.0	12.8	10.6	17.4	7.0	6.4	2.1	<b>7.9</b>
	Doctoral	0.0	0.0	0.5	1.1	1.1	0.5	0.0	0.0	<b>0.4</b>
F	Below primary school level	0.0	0.0	0.0	0.0	3.1	5.4	6.2	8.5	<b>3.3</b>
	Primary school	0.5	0.0	1.5	3.5	9.6	15.1	29.1	38.8	<b>13.7</b>
	Secondary school	30.1	12.4	16.0	26.0	44.1	54.3	45.9	38.4	<b>35.7</b>
	Professional college and university	65.8	75.6	69.0	51.5	31.0	18.3	15.6	13.8	<b>38.8</b>
	Master	3.6	12.0	13.0	17.7	11.5	6.9	3.2	0.4	<b>8.2</b>
	Doctoral	0.0	0.0	0.5	1.3	0.8	0.0	0.0	0.0	<b>0.3</b>

**Table 3-3-1-6 Working environment (%)**

Gender	Working environment	Aged	Aged	Aged	Aged	Aged	Aged	Aged	Aged	Total
		20~24	25~29	30~34	35~39	40~44	45~49	50~54	55~59	
M	Outdoor	10.7	10.4	10.8	11.6	18.0	25.1	34.2	29.5	<b>19.1</b>
	Indoors (naturally ventilated)	20.3	10.4	10.8	18.0	16.9	18.6	18.7	29.5	<b>17.9</b>
	Indoors (air conditioned)	69.0	79.1	78.5	70.4	65.2	56.3	47.0	40.9	<b>63.0</b>
F	Outdoor	1.0	0.0	1.5	1.7	3.1	4.4	4.4	1.8	<b>2.5</b>
	Indoors (naturally ventilated)	11.7	7.7	7.0	15.2	20.3	29.7	35.9	49.6	<b>23.7</b>
	Indoors (air conditioned)	87.2	92.3	91.5	83.1	76.6	65.9	59.7	48.7	<b>73.8</b>

**Table 3-3-1-7** Average working hours per week (%)

Gender	Working hours (hrs)	Aged 20~24	Aged 25~29	Aged 30~34	Aged 35~39	Aged 40~44	Aged 45~49	Aged 50~54	Aged 55~59	Total
M	Unemployed	10.2	1.5	0.0	1.1	0.6	1.0	5.5	9.8	<b>3.7</b>
	Below 20	12.3	3.0	0.0	2.1	0.6	1.5	2.3	4.7	<b>3.3</b>
	20~35	12.3	2.5	4.1	2.1	3.9	4.0	4.1	6.7	<b>4.9</b>
	35~40	23.0	29.9	41.5	43.4	43.3	53.3	48.9	43.0	<b>40.9</b>
	40~50	39.0	57.2	48.7	43.9	44.9	35.2	34.2	29.5	<b>41.5</b>
	At least 50	3.2	6.0	5.6	7.4	6.7	5.0	5.0	6.2	<b>5.6</b>
F	Unemployed	12.2	1.0	0.0	0.9	0.8	6.0	5.0	11.2	<b>4.6</b>
	Below 20	9.2	2.9	2.5	6.9	5.4	11.4	12.9	17.0	<b>8.9</b>
	20~35	10.2	4.3	8.0	5.2	8.4	7.9	12.1	17.4	<b>9.3</b>
	35~40	24.0	45.0	47.0	38.5	33.3	27.8	22.9	23.7	<b>31.9</b>
	40~50	40.8	44.0	36.0	39.0	44.1	36.9	37.6	20.1	<b>37.4</b>
	At least 50	3.6	2.9	6.5	9.5	8.0	10.1	9.4	10.7	<b>7.9</b>

**3.2. Lifestyle**

**Table 3-3-2-1** Average sleeping hours per day (%)

Gender	Age group (year)	Subjects (n)	Below 6 hrs	6~9 hrs	9 hrs or more
M	20~24	185	17.3	80.0	2.7
	25~29	201	10.0	85.1	5.0
	30~34	195	15.9	82.6	1.5
	35~39	189	10.1	87.8	2.1
	40~44	177	12.4	85.9	1.7
	45~49	199	10.1	87.4	2.5
	50~54	216	15.3	82.4	2.3
	55~59	190	17.9	76.8	5.3
F	20~24	196	15.8	79.1	5.1
	25~29	209	11.0	88.0	1.0
	30~34	200	10.5	88.0	1.5
	35~39	231	8.2	88.7	3.0
	40~44	258	16.7	80.2	3.1
	45~49	315	18.1	78.4	3.5
	50~54	339	21.5	75.5	2.9
	55~59	224	25.0	70.1	4.9
<b>Total</b>		<b>3524</b>	<b>15.2</b>	<b>81.8</b>	<b>3.0</b>



Table 3-3-2-2 Quality of sleep (%)

Gender	Age group (year)	Subjects (n)	Poor	Reasonable	Good
M	20~24	187	8.0	70.6	21.4
	25~29	201	9.0	69.7	21.4
	30~34	195	13.3	67.7	19.0
	35~39	189	9.5	70.4	20.1
	40~44	178	10.7	67.4	21.9
	45~49	199	8.0	71.9	20.1
	50~54	219	7.8	64.8	27.4
	55~59	193	11.9	71.0	17.1
F	20~24	196	6.6	72.4	20.9
	25~29	209	8.6	71.8	19.6
	30~34	200	12.5	69.5	18.0
	35~39	231	11.7	68.8	19.5
	40~44	261	14.6	71.3	14.2
	45~49	317	14.5	67.5	18.0
	50~54	340	17.9	63.2	18.8
	55~59	224	18.3	60.3	21.4
<b>Total</b>		<b>3539</b>	<b>11.9</b>	<b>68.4</b>	<b>19.8</b>

Table 3-3-2-3 Average walking hours per day (%)

Gender	Age group(year)	Subjects (n)	Below 30 mins	30~60 mins	1~2 hrs	2 hrs or more
M	20~24	186	52.2	34.4	9.1	4.3
	25~29	201	52.2	30.3	4.5	12.9
	30~34	195	55.9	28.2	10.8	5.1
	35~39	189	52.9	29.1	9.0	9.0
	40~44	178	56.7	28.1	8.4	6.7
	45~49	199	38.7	37.7	11.6	12.1
	50~54	219	37.0	34.7	11.0	17.4
	55~59	193	33.2	35.2	18.7	13.0
F	20~24	196	60.7	29.6	6.1	3.6
	25~29	209	68.9	26.8	2.9	1.4
	30~34	200	61.0	29.5	6.0	3.5
	35~39	232	62.1	25.4	6.5	6.0
	40~44	261	50.2	29.1	7.3	13.4
	45~49	317	40.7	29.7	12.0	17.7
	50~54	339	28.0	36.3	15.9	19.8
	55~59	224	26.3	36.2	22.8	14.7
<b>Total</b>		<b>3538</b>	<b>47.4</b>	<b>31.4</b>	<b>10.4</b>	<b>10.8</b>

Table 3-3-2-4 Average sitting hours per day (%)

Gender	Age group (year)	Subjects (n)	Below 3 hrs	3~6 hrs	6~9 hrs	9~12 hrs	12 hrs or more
M	20~24	187	10.2	39.6	25.7	17.1	7.5
	25~29	201	12.4	29.4	24.9	23.9	9.5
	30~34	195	8.2	33.3	31.8	21.0	5.6
	35~39	189	19.6	38.6	25.4	12.7	3.7
	40~44	178	22.5	38.8	24.7	12.4	1.7
	45~49	199	19.1	46.7	25.1	6.0	3.0
	50~54	219	23.3	45.2	21.0	9.6	0.9
	55~59	193	25.4	40.9	25.9	6.2	1.6
F	20~24	196	8.2	28.6	32.7	21.9	8.7
	25~29	209	4.8	20.6	36.4	28.7	9.6
	30~34	200	6.5	21.5	38.5	25.5	8.0
	35~39	232	9.5	31.9	31.5	21.1	6.0
	40~44	261	18.4	28.0	30.7	16.9	6.1
	45~49	317	20.8	42.9	17.7	15.8	2.8
	50~54	340	22.4	51.5	17.4	7.1	1.8
	55~59	224	21.4	52.7	20.1	4.0	1.8
<b>Total</b>		<b>3540</b>	<b>16.2</b>	<b>37.5</b>	<b>26.2</b>	<b>15.3</b>	<b>4.7</b>

Table 3-3-2-5 Activities during leisure time (%)

Gender	Age group (year)	Subjects (n)	Physical exercise	Chess	Traveling	Gathering	Audio-visual Entertainment	House chores	Sleeping	Others
M	20~24	187	52.4	11.8	43.9	39.6	70.1	6.4	34.8	12.3
	25~29	201	46.8	4.5	49.8	37.8	68.7	11.4	39.8	15.9
	30~34	195	48.7	5.6	31.3	44.6	76.9	24.1	34.4	16.4
	35~39	189	49.2	5.8	34.4	39.2	69.8	24.3	28.0	21.2
	40~44	178	48.9	6.2	19.7	36.0	65.2	38.2	36.0	15.7
	45~49	198	52.0	7.1	17.7	31.3	57.6	39.9	23.2	15.7
	50~54	219	50.2	9.1	14.6	18.3	58.9	35.2	23.3	17.4
	55~59	192	44.3	6.3	10.4	16.1	55.7	41.7	28.6	13.0
F	20~24	196	17.3	5.1	44.9	55.1	71.4	19.4	51.5	16.8
	25~29	207	16.4	1.9	33.8	58.0	77.3	24.2	56.5	14.0
	30~34	200	19.5	4.5	22.5	50.5	64.0	43.0	50.0	18.5
	35~39	232	24.6	1.7	20.3	47.8	59.9	53.0	40.1	22.0
	40~44	261	29.1	3.8	14.6	34.1	59.0	64.8	35.2	17.6
	45~49	317	36.3	2.8	6.6	30.3	62.1	73.2	25.6	14.8
	50~54	339	39.5	5.3	7.7	30.1	58.1	76.1	21.2	13.3
	55~59	223	47.5	4.9	8.5	23.3	61.0	70.9	18.4	13.9
<b>Total</b>		<b>3534</b>	<b>38.5</b>	<b>5.2</b>	<b>22.2</b>	<b>36.4</b>	<b>64.2</b>	<b>43.7</b>	<b>33.3</b>	<b>16.1</b>

Table 3-3-2-6 Cigarette consumption per day (%)

Gender	Age group (year)	Smokers	Less than 10 pieces	10~20 pieces	More than 20 pieces
M	20~24	34	55.9	44.1	0.0
	25~29	33	60.6	39.4	0.0
	30~34	43	48.8	51.2	0.0
	35~39	34	44.1	47.1	8.8
	40~44	41	22.0	58.5	19.5
	45~49	40	32.5	57.5	10.0
	50~54	48	29.2	45.8	25.0
	55~59	52	28.8	44.2	26.9
F	20~24	8	100.0	0.0	0.0
	25~29	6	83.3	16.7	0.0
	30~34	11	72.7	18.2	9.1
	35~39	8	75.0	25.0	0.0
	40~44	9	77.8	22.2	0.0
	45~49	6	66.7	33.3	0.0
	50~54	6	50.0	50.0	0.0
	55~59	3	33.3	66.7	0.0
<b>Total</b>		<b>382</b>	<b>44.0</b>	<b>45.0</b>	<b>11.0</b>

Table 3-3-2-7 Duration of smoking (%)

Gender	Age group (year)	Subjects (n)	Less than 5 years	5~10 years	10~15 years	15 years or more
M	20~24	41	65.9	17.1	17.1	0.0
	25~29	43	37.2	32.6	23.3	7.0
	30~34	54	14.8	24.1	48.1	13.0
	35~39	45	13.3	31.1	22.2	33.3
	40~44	56	10.7	8.9	14.3	66.1
	45~49	59	13.6	16.9	6.8	62.7
	50~54	71	5.6	12.7	11.3	70.4
	55~59	73	1.4	6.8	21.9	69.9
F	20~24	9	66.7	33.3	0.0	0.0
	25~29	10	30.0	50.0	20.0	0.0
	30~34	16	25.0	37.5	18.8	18.8
	35~39	10	30.0	20.0	40.0	10.0
	40~44	13	23.1	30.8	7.7	38.5
	45~49	8	25.0	37.5	0.0	37.5
	50~54	6	0.0	16.7	16.7	66.7
	55~59	4	0.0	0.0	25.0	75.0
<b>Total</b>		<b>518</b>	<b>18.7</b>	<b>19.5</b>	<b>19.5</b>	<b>42.3</b>

**Table 3-3-2-8** Quitting smoking (%)

Gender	Period of quitting	Age group(year)							
		20~24	25~29	30~34	35~39	40~44	45~49	50~54	55~59
M	Subjects quitting smoking (n)	7	10	11	11	15	19	23	21
	Quit smoking for less than 2 years	42.9	40.0	45.5	45.5	13.3	5.3	21.7	14.3
	Quit smoking for at least 2 years	57.1	60.0	54.5	54.5	86.7	94.7	78.3	85.7
F	Subjects quitting smoking (n)	1	4	5	2	4	2	0	1
	Quit smoking for less than 2 years	100.0	25.0	80.0	0.0	25.0	0.0	0.0	0.0
	Quit smoking for at least 2 years	0.0	75.0	20.0	100.0	75.0	100.0	0.0	100.0

**Table 3-3-2-9** Alcohol consumption (%)

Gender	Drinkers	Age group(year)							
		20~24	25~29	30~34	35~39	40~44	45~49	50~54	55~59
M	Subjects (n)	187	201	195	189	178	199	219	193
	Percentage of drinkers	49.7	61.7	54.9	52.4	53.9	44.2	52.5	49.7
F	Subjects (n)	196	209	200	231	261	317	340	224
	Percentage of drinkers	28.1	29.7	21.5	24.1	18.4	14.8	15.0	12.9

**Table 3-3-2-10** Frequency of drinking (%)

Gender	Age group (year)	Drinkers (n)	1 time /month	1~2	3~4	5~7
				times/week	times /week	times/week
M	20~24	93	60.2	35.5	3.2	1.1
	25~29	124	68.5	24.2	4.8	2.4
	30~34	107	60.7	31.8	4.7	2.8
	35~39	99	47.5	41.4	3.0	8.1
	40~44	96	46.9	33.3	11.5	8.3
	45~49	88	38.6	35.2	15.9	10.2
	50~54	114	31.6	30.7	19.3	18.4
	55~59	96	27.1	46.9	11.5	14.6
F	20~24	54	75.9	20.4	0.0	3.7
	25~29	62	75.8	21.0	1.6	1.6
	30~34	43	67.4	23.3	2.3	7.0
	35~39	56	75.0	19.6	1.8	3.6
	40~44	48	68.8	22.9	2.1	6.3
	45~49	47	53.2	21.3	14.9	10.6
	50~54	51	66.7	17.6	13.7	2.0
	55~59	29	48.3	27.6	13.8	10.3
<b>Total</b>		<b>1207</b>	<b>54.6</b>	<b>30.2</b>	<b>8.0</b>	<b>7.2</b>

Table 3-3-2-11 Types of alcohol consumed (%)

Gender	Age group (year)	Drinkers (n)	Liquor	Beer	Yellow wine	Rice wine	Wine or fruit wine	Mixed
M	20~24	93	14.0	38.7	0.0	0.0	15.1	32.3
	25~29	124	12.1	54.0	0.0	0.0	19.4	14.5
	30~34	107	6.5	58.9	0.0	0.9	19.6	14.0
	35~39	99	4.0	65.7	1.0	0.0	20.2	9.1
	40~44	96	3.1	64.6	0.0	0.0	28.1	4.2
	45~49	88	3.4	58.0	0.0	1.1	30.7	6.8
	50~54	114	0.9	61.4	0.9	4.4	30.7	1.8
	55~59	96	7.3	44.8	2.1	7.3	31.3	7.3
F	20~24	54	13.0	27.8	0.0	0.0	24.1	35.2
	25~29	62	8.1	22.6	0.0	0.0	29.0	40.3
	30~34	43	7.0	11.6	0.0	0.0	65.1	16.3
	35~39	56	3.6	26.8	0.0	0.0	64.3	5.4
	40~44	48	0.0	29.2	0.0	6.3	60.4	4.2
	45~49	47	0.0	25.5	0.0	4.3	57.4	12.8
	50~54	51	2.0	33.3	0.0	2.0	56.9	5.9
	55~59	29	0.0	27.6	3.4	0.0	62.1	6.9
<b>Total</b>		<b>1207</b>	<b>5.9</b>	<b>46.1</b>	<b>0.4</b>	<b>1.7</b>	<b>32.8</b>	<b>13.1</b>

Table 3-3-2-12 Frequency of physical exercise per week (%)

Gender	Age group (year)	Subjects (n)	Participants (n)	At most once	1~2 times	3~4 times	5 times or more
M	20~24	187	146	30.1	45.2	13.7	11.0
	25~29	201	150	33.4	47.3	14.0	5.3
	30~34	195	152	38.2	38.8	13.8	9.2
	35~39	189	154	23.4	48.1	18.8	9.7
	40~44	178	135	24.4	37.8	29.6	8.1
	45~49	199	151	21.9	38.4	25.2	14.6
	50~54	219	163	19.0	27.0	27.6	26.4
	55~59	193	141	11.3	34.8	26.2	27.7
F	20~24	196	124	50.0	39.5	3.2	7.3
	25~29	209	125	61.6	25.6	7.2	5.6
	30~34	200	113	46.0	38.9	12.4	2.7
	35~39	232	150	46.7	38.0	9.3	6.0
	40~44	261	156	23.7	46.8	19.2	10.3
	45~49	317	210	22.9	34.3	23.8	19.0
	50~54	340	236	12.3	26.3	26.3	35.2
	55~59	224	156	9.6	21.2	26.9	42.3
<b>Total</b>		<b>3540</b>	<b>2462</b>	<b>28.1</b>	<b>36.3</b>	<b>19.3</b>	<b>16.3</b>

**Table 3-3-2-13 Duration of each physical exercise (%)**

Gender	Age group (year)	Participants (n)	Less than 30 mins	30~60 mins	60 mins or more
M	20~24	145	25.5	37.9	36.6
	25~29	150	25.3	40.0	34.7
	30~34	153	34.6	30.7	34.6
	35~39	154	37.7	39.0	23.4
	40~44	135	37.0	48.9	14.1
	45~49	151	33.8	43.0	23.2
	50~54	163	33.7	46.0	20.2
	55~59	141	39.0	42.6	18.4
F	20~24	124	40.3	42.7	16.9
	25~29	125	39.2	48.0	12.8
	30~34	113	44.2	46.9	8.8
	35~39	150	38.7	48.0	13.3
	40~44	156	38.5	44.2	17.3
	45~49	211	35.1	48.8	16.1
	50~54	236	29.2	41.1	29.7
	55~59	156	26.3	39.7	34.0
<b>Total</b>		<b>2463</b>	<b>34.4</b>	<b>42.9</b>	<b>22.7</b>

**Table 3-3-2-14 Self-perception during physical exercise (%)**

Gender	Age group (year)	Participants (n)	Not much change in breathing and heart rate	Slight increase in breathing and heart rate with little perspiration	Rapid breathing, apparent increase in heart rate and perspiring greatly
M	20~24	146	4.1	39.7	56.2
	25~29	150	6.7	40.0	53.3
	30~34	152	3.9	50.0	46.1
	35~39	154	8.4	44.2	47.4
	40~44	135	10.4	57.0	32.6
	45~49	151	22.5	45.0	32.5
	50~54	163	28.8	48.5	22.7
	55~59	141	26.2	49.6	24.1
F	20~24	124	5.6	69.4	25.0
	25~29	125	2.4	70.4	27.2
	30~34	113	10.6	62.8	26.5
	35~39	150	16.0	61.3	22.7
	40~44	156	15.4	64.7	19.9
	45~49	210	24.3	58.6	17.1
	50~54	236	26.3	59.3	14.4
	55~59	156	38.5	53.8	7.7
<b>Total</b>		<b>2462</b>	<b>16.7</b>	<b>54.5</b>	<b>28.9</b>

**Table 3-3-2-15 Duration of persistent exercising (%)**

Gender	Age group (year)	Participants (n)	Less than 6 months	6~12 months	1~3 years	3~5 years	5 years or more
M	20~24	146	45.9	17.1	10.3	4.1	22.6
	25~29	149	46.3	11.4	12.8	3.4	26.2
	30~34	151	42.4	12.6	11.3	3.3	30.5
	35~39	153	35.9	10.5	14.4	12.4	26.8
	40~44	135	32.6	19.3	11.9	5.9	30.4
	45~49	151	33.1	9.9	15.2	6.0	35.8
	50~54	163	21.5	8.0	11.0	7.4	52.1
	55~59	141	18.4	8.5	13.5	6.4	53.2
F	20~24	124	67.7	16.1	4.8	5.6	5.6
	25~29	125	71.2	12.8	8.0	4.8	3.2
	30~34	113	49.6	19.5	15.0	7.1	8.8
	35~39	149	53.0	13.4	12.1	4.0	17.4
	40~44	156	46.2	13.5	15.4	5.1	19.9
	45~49	210	32.9	9.5	23.3	7.1	27.1
	50~54	236	25.8	13.1	21.2	11.9	28.0
	55~59	156	16.0	10.3	21.8	12.2	39.7
<b>Total</b>		<b>2458</b>	<b>38.4</b>	<b>12.6</b>	<b>14.5</b>	<b>6.9</b>	<b>27.5</b>

**Table 3-3-2-16 Purposes of physical exercise (%)**

Gender	Age group (year)	Participants (n)	Disease prevention and cure	Improvement in physical ability	Weight loss and fitness	Pressure relieve and mood regulation	Socializing	Others
M	20~24	146	37.7	73.3	43.2	56.2	24.7	10.3
	25~29	150	48.7	69.3	42.7	62.0	28.0	11.3
	30~34	152	48.7	77.6	40.1	66.4	17.1	13.8
	35~39	154	58.4	64.9	33.8	62.3	19.5	16.2
	40~44	135	60.0	58.5	31.1	63.0	16.3	11.9
	45~49	151	56.3	46.4	27.8	49.0	16.6	13.9
	50~54	163	65.6	54.6	27.0	47.9	14.1	6.1
	55~59	141	73.8	51.1	14.2	36.9	8.5	9.9
F	20~24	124	45.2	59.7	64.5	66.1	11.3	8.1
	25~29	125	48.0	50.4	60.8	72.8	12.8	6.4
	30~34	113	59.3	49.6	61.9	68.1	10.6	5.3
	35~39	150	66.7	42.7	58.7	67.3	13.3	11.3
	40~44	156	67.3	41.0	55.8	57.1	9.6	9.6
	45~49	210	74.3	34.8	42.4	54.8	11.4	11.0
	50~54	236	78.4	44.5	32.2	41.5	15.3	8.5
	55~59	156	76.9	38.5	26.3	42.9	11.5	11.5
<b>Total</b>		<b>2462</b>	<b>61.7</b>	<b>52.7</b>	<b>40.4</b>	<b>56.1</b>	<b>15.1</b>	<b>10.4</b>

**Table 3-3-2-17 Major locations of physical exercise (%)**

Gender	Age group (year)	Participants (n)	Stadium/arena	Park	Office/Residential area	Open ground	Road or street	Club	Others
M	20~24	146	78.1	40.4	8.9	26.7	21.2	12.3	8.2
	25~29	150	70.7	42.0	12.0	22.0	17.3	22.7	12.7
	30~34	152	69.7	42.1	12.5	22.4	21.1	14.5	11.2
	35~39	154	57.1	55.2	13.0	29.2	17.5	13.6	10.4
	40~44	135	57.0	54.8	13.3	33.3	24.4	12.6	10.4
	45~49	151	41.7	49.7	6.0	23.2	32.5	6.6	7.9
	50~54	163	36.2	50.3	17.8	18.4	25.2	12.9	6.7
	55~59	141	30.5	58.9	10.6	29.8	28.4	9.9	4.3
F	20~24	124	57.3	47.6	16.9	36.3	15.3	11.3	11.3
	25~29	125	61.6	52.0	13.6	23.2	12.0	8.8	9.6
	30~34	113	53.1	46.9	21.2	23.0	20.4	14.2	11.5
	35~39	150	44.0	56.7	13.3	20.7	14.7	13.3	14.7
	40~44	156	37.8	54.5	20.5	12.2	12.8	15.4	15.4
	45~49	210	38.6	56.7	24.8	16.7	10.0	10.0	8.6
	50~54	236	33.1	57.6	22.0	13.6	12.7	7.6	7.6
	55~59	156	40.4	60.9	16.0	14.7	5.8	7.7	6.4
<b>Total</b>		<b>2462</b>	<b>49.2</b>	<b>52.1</b>	<b>15.6</b>	<b>22.1</b>	<b>17.8</b>	<b>11.9</b>	<b>9.7</b>



Table 3-3-2-18 Major sports activities (%)

Gender	Age Group (year)	Participants (n)	Jogging	Swimming	Walking	Ball games	Hiking	Cycling	Work out	Aerobics and yangko	Martial arts and Qigong	Boxing	Fencing	Yoga	Judo	Tae-kwondo	Karate	Others	
M	20~24	143	64.4	27.4	31.5	67.8	2.1	10.3	20.5	2.7	2.7	0.0	0.0	0.0	0.0	1.4	1.4	8.9	
	25~29	150	69.3	24.0	24.7	69.3	4.0	4.7	26.7	1.3	0.7	1.3	2.0	1.3	0.7	0.7	0.7	6.0	
	30~34	148	69.1	23.0	33.6	63.2	5.9	13.8	16.4	2.0	2.0	0.0	0.0	2.0	0.0	1.3	0.0	11.8	
	35~39	152	61.0	27.3	44.2	50.0	5.8	12.3	14.9	1.3	5.2	1.9	0.0	1.9	0.0	0.0	1.3	10.4	
	40~44	133	51.1	46.7	51.9	37.0	7.4	11.9	14.1	0.0	2.2	0.0	0.0	0.7	0.0	0.7	0.0	14.8	
	45~49	145	51.7	23.2	47.0	31.8	13.9	17.2	5.3	1.3	8.6	0.7	0.0	0.7	0.0	0.0	0.0	10.6	
	50~54	159	50.9	26.4	57.7	23.3	14.7	14.7	9.8	2.5	8.0	0.0	0.0	0.0	0.0	0.0	0.0	9.8	
	55~59	139	46.8	31.9	57.4	7.1	10.6	8.5	7.8	5.7	10.6	0.0	0.0	2.1	0.0	0.0	2.1	7.1	
	F	20~24	124	58.1	22.6	51.6	41.9	6.5	10.5	10.5	12.9	0.8	0.8	1.6	13.7	0.0	0.0	0.0	11.3
		25~29	123	63.2	17.6	54.4	42.4	7.2	10.4	7.2	13.6	0.8	0.8	0.0	21.6	0.8	0.0	0.8	8.0
30~34		113	46.9	24.8	64.6	31.0	8.0	4.4	5.3	15.0	1.8	0.0	0.0	19.5	0.0	0.0	0.0	8.8	
35~39		149	45.3	25.3	62.0	30.7	12.7	5.3	8.0	14.0	2.7	0.0	0.0	21.3	0.7	0.0	0.0	12.0	
40~44		153	34.6	17.9	69.9	16.0	7.7	5.8	8.3	19.2	6.4	1.3	0.0	19.9	0.0	0.0	0.0	20.5	
45~49		204	29.5	15.7	62.9	12.9	10.0	6.2	10.5	20.5	11.0	0.0	0.5	15.2	0.0	0.0	0.0	12.9	
50~54		227	15.3	22.9	61.0	10.2	8.9	6.4	7.6	25.4	17.4	0.0	0.0	12.3	0.0	0.0	0.0	13.1	
55~59		146	11.5	24.4	51.3	9.6	8.3	3.2	7.7	29.5	26.3	1.3	0.0	9.0	0.0	0.0	0.0	13.5	
<b>Total</b>			<b>2408</b>	<b>46.1</b>	<b>24.7</b>	<b>52.0</b>	<b>32.5</b>	<b>8.5</b>	<b>9.0</b>	<b>11.3</b>	<b>11.2</b>	<b>7.4</b>	<b>0.5</b>	<b>0.2</b>	<b>8.8</b>	<b>0.1</b>	<b>0.2</b>	<b>0.4</b>	<b>11.4</b>

Table 3-3-2-19 Ball games frequently participated (%)

Gender	Age group (year)	Participants (n)	Ball games frequently participated (%)									
			Basketball	Volleyball	Football	Table tennis	Badminton	Tennis	Golf	Billiards	Others	
M	20~24	100	28.4	1.9	26.0	12.6	14.4	1.9	0.0	7.4	7.4	
	25~29	106	25.0	0.4	25.9	9.1	17.7	3.0	0.0	10.8	8.2	
	30~34	96	22.7	1.0	23.2	18.2	17.2	5.9	0.0	4.9	6.9	
	35~39	76	10.7	0.7	25.5	22.1	21.5	8.7	0.0	4.7	6.0	
	40~44	54	11.3	0.0	21.6	18.6	25.8	8.2	1.0	4.1	9.3	
	45~49	54	9.9	0.0	24.7	18.5	27.2	4.9	1.2	3.7	9.9	
	50~54	39	7.9	3.2	25.4	27.0	19.0	7.9	1.6	1.6	6.3	
	55~59	11	14.3	0.0	38.1	9.5	19.0	0.0	0.0	4.8	14.3	
	F	20~24	56	24.5	7.5	0.0	14.2	42.5	2.8	0.0	2.8	5.7
		25~29	55	17.0	5.3	0.0	20.2	43.6	1.1	1.1	1.1	10.6
30~34		38	5.1	1.7	1.7	13.6	45.8	10.2	1.7	3.4	16.9	
35~39		50	4.9	2.4	1.2	22.0	51.2	9.8	2.4	0.0	6.1	
40~44		30	8.5	2.1	0.0	21.3	40.4	8.5	0.0	0.0	19.1	
45~49		33	3.5	3.5	0.0	29.8	35.1	7.0	1.8	0.0	19.3	
50~54		29	2.7	0.0	0.0	21.6	54.1	5.4	0.0	0.0	16.2	
55~59		17	4.8	0.0	0.0	19.0	28.6	4.8	4.8	0.0	38.1	
<b>Total</b>			<b>844</b>	<b>15.8</b>	<b>1.9</b>	<b>16.0</b>	<b>17.7</b>	<b>28.3</b>	<b>5.4</b>	<b>0.7</b>	<b>4.3</b>	<b>9.9</b>

Table 3-3-2-20 Major obstacles for participating in physical exercise (%)

Gender	Age group (year)	Subjects (n)	Lack of interest	Laziness	Healthy, not necessary to exercise	Too weak	Work is too labour intensive, not necessary to exercise	Lack of time	Lack of locations and facilities	Lack of guidance	Lack of organization	Lack of money	Embarrassment	Others
M	20~24	186	14.5	67.2	2.2	2.7	4.3	59.7	27.4	10.2	21.5	3.8	2.7	5.9
	25~29	195	8.2	68.7	3.6	4.1	7.2	67.7	30.3	11.8	18.5	2.1	2.1	6.7
	30~34	191	12.0	59.2	2.1	2.1	6.3	72.3	37.7	8.4	18.8	3.1	0.0	9.9
	35~39	183	14.2	54.6	1.6	2.7	7.1	71.0	33.3	8.7	12.0	3.3	1.1	9.3
	40~44	173	8.1	59.5	1.2	1.7	4.6	65.9	23.1	5.8	13.9	1.7	0.0	8.7
	45~49	180	14.4	49.4	5.0	4.4	11.7	47.2	18.9	8.9	8.9	1.7	0.6	11.1
	50~54	182	17.0	38.5	3.3	6.0	10.4	47.3	17.0	7.1	5.5	2.2	0.0	9.9
	55~59	154	15.6	28.6	1.3	3.2	13.6	49.4	11.0	8.4	6.5	1.9	0.6	9.7
F	20~24	194	20.1	74.2	1.0	3.1	2.1	68.0	23.7	14.9	15.5	1.5	0.0	6.7
	25~29	208	17.8	80.3	0.5	3.8	2.9	67.8	30.8	12.5	16.3	2.4	0.5	4.8
	30~34	198	19.7	66.2	0.5	7.6	4.0	65.2	25.3	13.1	17.2	1.5	1.5	4.5
	35~39	225	14.2	69.8	0.9	4.0	4.9	72.0	23.6	13.3	8.0	2.2	0.0	5.8
	40~44	243	14.8	51.0	1.6	4.5	9.5	69.5	10.7	13.6	8.2	1.6	0.0	8.6
	45~49	286	12.6	46.9	1.4	8.7	13.3	62.6	10.5	9.1	5.9	1.7	0.3	13.3
	50~54	294	12.2	39.8	0.7	9.5	11.2	57.1	11.2	11.2	5.4	3.4	0.0	12.2
	55~59	187	11.2	38.0	1.1	10.2	6.4	52.9	7.0	10.2	2.7	1.6	1.6	11.8
<b>Total</b>		<b>3279</b>	<b>14.1</b>	<b>55.6</b>	<b>1.7</b>	<b>5.2</b>	<b>7.7</b>	<b>62.5</b>	<b>20.7</b>	<b>10.6</b>	<b>11.2</b>	<b>2.3</b>	<b>0.6</b>	<b>8.8</b>

Table 3-3-2-21 Sports events frequently watched (%)

Gender	Age group (year)	Subjects (n)	Basketball	Volleyball	Football	Gymnastics	Swimming	Martial arts	Boxing	Table tennis	Billiards	Golf	Badminton	Water polo	Baseball	Softball	Weightlifting	Fencing	Wrestling & Judo	Others	
M	20~24	177	61.6	7.9	66.7	2.3	11.3	9.0	4.5	11.3	10.7	0.0	16.9	0.6	1.7	2.3	0.6	0.0	3.4	21.5	
	25~29	191	64.9	9.9	70.7	8.9	12.0	3.7	7.3	12.0	12.6	0.0	13.1	0.0	0.5	0.0	0.5	1.6	4.2	21.5	
	30~34	182	51.1	10.4	64.3	7.7	12.6	4.9	7.7	15.4	15.4	1.1	18.7	0.5	2.7	0.0	2.2	0.0	6.6	29.1	
	35~39	174	35.6	14.9	62.1	6.9	14.9	9.8	10.9	17.8	8.6	1.7	16.7	0.6	1.1	0.6	1.1	0.6	2.9	27.6	
	40~44	167	35.9	10.2	58.1	12.0	24.6	9.0	4.8	17.4	11.4	0.6	16.2	0.0	0.6	0.0	0.0	0.0	3.0	31.1	
	45~49	180	32.2	6.7	56.7	11.1	23.9	12.2	8.9	19.4	5.6	1.7	11.7	0.6	0.6	0.0	0.6	0.0	1.1	24.4	
	50~54	186	28.0	11.8	54.8	14.5	24.2	12.9	10.2	19.4	5.9	1.1	10.8	0.5	0.5	0.0	2.2	0.0	0.5	22.0	
	55~59	160	27.5	4.4	59.4	11.9	19.4	18.1	15.0	15.0	3.1	0.0	6.3	0.0	0.0	0.0	2.5	1.3	1.9	19.4	
	F	20~24	163	33.1	30.1	22.7	31.3	37.4	1.2	0.6	12.3	3.1	0.6	27.6	1.2	0.0	0.0	0.6	1.8	1.8	23.9
		25~29	161	32.3	33.5	19.9	35.4	36.6	3.1	0.6	11.2	1.9	0.0	19.9	0.0	0.6	0.0	1.9	0.6	3.1	22.4
30~34		149	20.1	25.5	16.1	32.9	40.9	4.0	1.3	13.4	1.3	1.3	25.5	0.0	0.7	0.0	0.7	0.7	1.3	27.5	
35~39		179	14.5	34.1	15.1	31.3	47.5	6.7	0.0	17.3	0.0	1.7	21.2	1.1	0.0	0.0	0.6	0.6	0.0	26.8	
40~44		171	15.8	29.8	17.5	29.8	40.9	7.6	0.6	11.1	0.6	3.5	19.9	0.6	0.0	0.0	0.6	1.2	0.0	27.5	
45~49		204	16.2	25.0	16.7	33.3	39.2	6.4	0.5	19.6	1.0	2.0	15.7	0.0	1.0	0.0	1.0	1.0	1.0	28.4	
50~54		205	15.1	24.4	18.0	33.2	43.4	11.2	2.0	14.6	1.0	1.5	16.6	0.0	0.0	0.0	0.5	0.0	0.0	28.3	
55~59		130	16.9	16.9	18.5	34.6	39.2	16.2	0.8	7.7	1.5	0.8	6.2	0.8	0.0	0.0	1.5	0.0	1.5	33.1	
<b>Total</b>		<b>2779</b>	<b>31.6</b>	<b>18.4</b>	<b>40.3</b>	<b>20.8</b>	<b>29.1</b>	<b>8.4</b>	<b>4.8</b>	<b>14.9</b>	<b>5.3</b>	<b>1.1</b>	<b>16.4</b>	<b>0.4</b>	<b>0.6</b>	<b>0.6</b>	<b>0.2</b>	<b>1.0</b>	<b>0.6</b>	<b>2.0</b>	<b>25.8</b>

**Table 3-3-2-22 Occurrence of diseases in the past five years (%)**

Gender	Disease-stricken subjects	Age group(year)							
		20~24	25~29	30~34	35~39	40~44	45~49	50~54	55~59
M	Subjects (n)	187	201	195	189	178	199	219	193
	Disease-stricken (%)	16.6	14.9	16.9	24.9	21.9	30.2	38.8	48.7
F	Subjects (n)	196	209	200	232	261	317	340	224
	Disease-stricken (%)	12.2	17.2	19.5	27.2	26.4	32.5	42.4	55.4

**Table 3-3-2-23 Diseases diagnosed in the past five years (%)**

Gender	Age group (year)	Disease-stricken subjects	Cancer	Cardio-vascular	Respiratory	Accidental injury	Digestive system	Hypertension	Endocrine	Urinary or reproductive	Diabetes	Others
M	20~24	31	0.0	0.0	16.1	22.6	22.6	12.9	6.5	9.7	0.0	32.3
	25~29	30	0.0	0.0	40.0	6.7	43.3	6.7	3.3	3.3	0.0	26.7
	30~34	33	3.0	3.0	39.4	18.2	24.2	12.1	0.0	9.1	0.0	36.4
	35~39	47	2.1	6.4	34.0	23.4	29.8	21.3	0.0	4.3	8.5	19.1
	40~44	39	2.6	2.6	23.1	15.4	28.2	35.9	0.0	5.1	7.7	20.5
	45~49	60	3.3	8.3	10.0	13.3	18.3	40.0	0.0	5.0	10.0	21.7
	50~54	86	4.7	11.6	10.5	5.8	15.1	39.5	1.2	12.8	10.5	19.8
	55~59	94	3.2	11.7	9.6	1.1	16.0	47.9	0.0	13.8	11.7	20.2
F	20~24	24	0.0	0.0	12.5	16.7	20.8	0.0	8.3	4.2	4.2	41.7
	25~29	36	5.6	0.0	36.1	19.4	36.1	0.0	13.9	5.6	0.0	22.2
	30~34	39	10.3	2.6	25.6	5.1	33.3	2.6	5.1	12.8	2.6	23.1
	35~39	63	20.6	3.2	28.6	7.9	20.6	4.8	15.9	9.5	3.2	20.6
	40~44	69	17.4	2.9	20.3	5.8	21.7	11.6	14.5	11.6	1.4	23.2
	45~49	104	22.1	7.7	9.6	3.8	16.3	27.9	7.7	7.7	4.8	29.8
	50~54	145	9.0	4.8	13.1	2.8	15.9	45.5	6.2	9.7	9.7	23.4
	55~59	124	14.5	4.0	6.5	4.0	21.0	38.7	0.8	4.0	12.1	29.0
<b>Total</b>	<b>1024</b>	<b>9.5</b>	<b>5.5</b>	<b>17.0</b>	<b>7.9</b>	<b>21.2</b>	<b>28.5</b>	<b>5.0</b>	<b>8.5</b>	<b>7.0</b>	<b>24.7</b>	

**Table 3-3-2-24 Had heard of or had participated in the “Physical Fitness Study” (%)**

Gender		Age group(year)							
		20~24	25~29	30~34	35~39	40~44	45~49	50~54	55~59
M	Subjects (n)	187	201	195	189	178	199	219	193
	Had heard of the Study	65.8	58.7	72.8	75.1	75.3	72.4	65.8	60.6
	Had previously participated in the Study	13.9	12.4	27.3	29.1	32.6	31.7	37.0	32.1
F	Subjects (n)	196	209	200	232	261	317	340	224
	Had heard of the Study	66.8	73.2	74.5	72.8	70.9	65.9	63.8	71.4
	Had previously participated in the Study	14.8	20.6	21.5	28.4	31.4	30.3	35.0	39.7

**Table 3-3-2-25** Understanding of the “Physical Fitness Study” (%)

Gender	Age group (year)	Subjects (n)	Meaningless	To understand physical fitness status	To understand the importance of physical exercise	To increase scientific knowledge of physical fitness
M	20~24	187	1.1	98.9	59.9	48.7
	25~29	201	3.0	95.5	69.7	57.2
	30~34	195	3.6	96.4	64.6	56.9
	35~39	188	3.7	97.9	64.4	54.8
	40~44	178	1.7	97.8	58.4	52.8
	45~49	199	2.5	93.0	52.3	47.2
	50~54	219	6.8	90.0	49.8	39.7
	55~59	192	4.2	91.7	46.4	40.1
F	20~24	196	2.0	96.4	61.7	49.0
	25~29	209	1.9	98.6	69.4	50.2
	30~34	200	5.0	95.0	60.0	49.5
	35~39	231	3.0	97.0	65.4	54.5
	40~44	260	2.3	96.9	58.8	48.1
	45~49	317	2.2	98.1	54.9	51.7
	50~54	339	2.9	93.8	60.8	53.7
	55~59	224	2.7	94.2	53.1	43.3
<b>Total</b>		<b>3535</b>	<b>3.0</b>	<b>95.7</b>	<b>59.2</b>	<b>50.0</b>

3.3. Anthropometric Measurements

Table 3-3-3-1 Height (cm)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	20~24	187	171.3	5.43	161.2	162.5	167.7	170.6	174.7	179.2	182.2
	25~29	201	171.5	6.08	159.8	161.3	167.2	171.5	174.5	179.7	184.2
	30~34	195	171.1	5.97	160.7	162.0	166.5	170.9	175.9	179.3	182.5
	35~39	189	170.7	5.80	159.8	161.3	166.7	170.8	174.8	178.2	182.1
	40~44	178	169.3	5.44	158.6	160.6	165.9	169.2	172.9	176.5	180.5
	45~49	199	168.3	5.75	157.3	158.5	164.7	168.2	172.2	176.3	178.8
	50~54	219	167.0	6.11	156.4	157.8	162.7	166.6	171.3	175.1	179.0
	55~59	193	166.5	5.32	157.2	158.3	163.0	166.1	170.0	173.1	178.8
F	20~24	196	159.0	5.08	149.4	150.6	155.5	159.0	162.2	165.2	169.5
	25~29	209	158.3	5.64	147.2	148.9	154.6	158.5	162.1	165.9	169.1
	30~34	200	158.4	6.12	147.5	149.1	154.5	158.4	162.7	165.2	169.2
	35~39	232	157.9	5.42	147.5	148.9	154.3	157.5	161.6	164.3	169.4
	40~44	261	157.4	5.10	148.4	149.6	153.9	157.2	160.9	164.2	167.1
	45~49	317	156.6	5.41	147.0	148.0	152.8	156.5	160.5	163.5	167.0
	50~54	340	155.6	5.12	145.9	147.6	152.4	155.3	159.0	162.0	165.5
	55~59	224	155.5	5.31	146.0	146.6	151.7	155.3	158.8	162.5	165.6

Table 3-3-3-2 Sitting height (cm)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	20~24	187	91.8	3.00	86.7	87.0	89.5	92.0	93.6	95.9	97.9
	25~29	200	92.2	3.06	87.1	87.7	90.2	91.8	94.0	96.4	98.8
	30~34	195	91.8	3.25	86.2	86.9	89.3	92.0	93.9	96.4	98.5
	35~39	189	92.3	3.28	86.7	87.5	89.9	91.7	94.7	96.7	98.8
	40~44	178	91.5	2.86	86.4	87.0	89.8	91.2	93.2	95.0	97.6
	45~49	199	91.2	2.98	85.5	86.2	89.2	91.2	93.2	95.1	97.0
	50~54	219	90.2	3.13	84.3	84.6	87.8	90.2	92.5	94.1	96.0
	55~59	193	89.7	2.93	84.3	84.6	87.6	89.7	91.9	93.4	95.4
F	20~24	196	86.0	2.77	81.0	81.6	84.1	86.0	88.0	89.3	91.1
	25~29	208	85.8	2.82	80.5	81.3	83.8	85.7	87.6	89.8	91.8
	30~34	200	85.7	3.25	80.5	80.9	83.7	85.8	87.9	89.3	91.7
	35~39	232	86.0	2.79	80.7	81.3	84.3	85.8	87.8	89.6	91.6
	40~44	261	85.6	3.37	80.6	81.2	83.8	85.6	87.7	89.7	91.5
	45~49	316	85.2	2.97	79.6	80.3	83.2	85.2	87.4	89.3	90.4
	50~54	340	84.3	2.98	79.2	79.7	82.2	84.3	86.2	88.2	89.9
	55~59	224	84.3	2.93	78.9	79.7	82.4	84.2	86.3	88.0	89.4

Table 3-3-3-3 Foot Length (cm)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	20~24	187	25.3	1.01	23.3	23.5	24.5	25.3	25.8	26.6	27.2
	25~29	201	25.3	1.18	23.1	23.5	24.5	25.3	26.0	26.8	28.0
	30~34	195	25.3	1.05	23.3	23.5	24.6	25.3	26.0	26.7	27.1
	35~39	189	25.2	1.04	23.2	23.4	24.5	25.2	25.8	26.6	27.3
	40~44	178	25.1	1.18	22.8	23.2	24.3	25.0	26.0	26.7	27.2
	45~49	199	24.9	1.14	22.7	23.0	24.1	25.0	25.6	26.3	27.1
	50~54	218	24.8	1.13	22.9	23.0	24.0	24.8	25.6	26.2	27.1
	55~59	193	24.8	1.10	22.8	23.0	24.0	24.8	25.6	26.2	26.9
F	20~24	196	22.6	0.89	21.0	21.1	22.1	22.6	23.1	23.5	24.4
	25~29	209	22.5	1.05	20.3	20.6	21.8	22.4	23.1	24.0	24.5
	30~34	200	22.6	1.05	20.8	20.9	21.9	22.5	23.3	23.9	24.8
	35~39	232	22.5	0.96	20.7	21.0	21.8	22.4	23.0	23.7	24.3
	40~44	261	22.6	0.90	21.0	21.2	22.0	22.7	23.3	23.7	24.3
	45~49	317	22.5	1.08	20.6	21.0	21.9	22.4	23.1	23.8	24.5
	50~54	340	22.5	0.95	20.7	20.9	21.8	22.4	23.1	23.6	24.3
	55~59	224	22.5	1.06	20.7	20.9	21.8	22.5	23.2	23.8	24.8

Table 3-3-3-4 Weight (kg)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	20~24	187	64.3	9.92	49.8	50.7	56.6	63.6	69.7	78.2	88.3
	25~29	201	66.6	11.92	50.7	51.8	58.5	64.2	73.2	81.9	93.0
	30~34	195	67.4	10.74	50.5	51.8	60.4	66.1	73.6	80.5	93.2
	35~39	189	69.6	10.40	53.5	55.2	61.4	69.8	75.1	82.5	97.7
	40~44	178	69.2	10.39	51.6	53.7	61.3	68.9	75.3	83.6	90.8
	45~49	199	68.6	9.82	51.8	53.1	62.1	68.2	75.1	80.9	86.1
	50~54	219	66.2	9.55	49.6	51.8	59.7	64.9	73.5	78.6	82.7
	55~59	193	65.3	9.37	49.0	50.7	59.0	64.6	70.6	77.5	86.7
F	20~24	196	51.6	7.76	40.0	41.4	46.8	50.0	55.3	62.5	69.8
	25~29	209	50.3	7.01	40.3	41.3	45.5	49.6	53.6	58.9	68.2
	30~34	200	53.3	9.16	40.8	41.4	47.1	52.6	57.7	62.9	75.1
	35~39	232	55.7	8.95	41.5	43.0	49.5	54.0	60.3	67.1	74.3
	40~44	261	57.0	8.18	45.1	45.7	51.2	56.5	62.0	67.0	73.8
	45~49	317	56.5	8.44	44.9	45.9	50.5	55.3	61.3	66.2	76.3
	50~54	340	55.9	7.85	43.2	44.2	50.9	55.1	60.7	66.8	72.4
	55~59	224	56.5	9.50	41.0	43.1	50.2	55.6	62.5	69.1	77.9



Table 3-3-3-5 BMI

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	20~24	187	21.9	3.08	17.2	17.7	19.5	21.6	23.5	25.9	29.9
	25~29	201	22.6	3.50	17.3	17.8	20.1	22.1	24.6	27.2	28.6
	30~34	195	23.0	3.37	17.8	18.3	20.8	22.4	24.7	27.3	31.4
	35~39	189	23.9	3.20	18.3	18.7	21.7	23.6	25.4	28.2	31.2
	40~44	178	24.1	3.12	18.6	19.4	22.2	23.7	25.8	28.7	31.0
	45~49	199	24.2	3.15	18.5	18.9	22.3	24.1	26.1	28.2	29.9
	50~54	219	23.7	2.92	18.5	19.0	21.7	23.5	25.3	27.6	29.5
	55~59	193	23.5	3.03	17.9	18.7	21.5	23.2	25.4	27.8	30.0
F	20~24	196	20.4	2.87	16.4	16.6	18.5	19.8	21.8	23.9	27.4
	25~29	209	20.1	2.43	16.6	16.9	18.4	19.8	21.3	22.8	26.4
	30~34	200	21.2	3.04	17.0	17.4	19.1	20.8	22.7	24.8	28.2
	35~39	232	22.3	3.47	17.2	17.6	19.7	21.8	24.3	26.8	30.2
	40~44	261	23.0	3.20	18.0	18.8	20.8	22.5	24.7	26.8	30.4
	45~49	317	23.0	3.08	18.7	19.0	20.9	22.4	24.7	26.9	30.0
	50~54	340	23.1	3.14	17.7	18.2	21.0	22.7	25.1	27.3	30.0
	55~59	224	23.3	3.45	17.6	18.8	20.8	23.0	25.2	28.0	30.5

Table 3-3-3-6 Weight Status according to height for weight standards (%)

Gender	Age group(year)	Subjects (n)	Underweight	Normal	Overweight	Obese
M	20~24	187	14.4	66.3	13.9	5.3
	25~29	201	7.5	62.2	25.9	4.5
	30~34	195	6.2	61.5	24.1	8.2
	35~39	189	3.2	52.4	33.9	10.6
	40~44	178	2.8	52.8	30.9	13.5
	45~49	199	2.5	45.2	40.2	12.1
	50~54	219	2.3	55.3	35.6	6.8
	55~59	193	4.1	54.9	33.7	7.3
	<b>Total</b>	<b>1561</b>	<b>5.3</b>	<b>56.3</b>	<b>29.9</b>	<b>8.5</b>
F	20~24	196	24.5	66.8	6.6	2.0
	25~29	209	28.2	66.0	4.3	1.4
	30~34	200	17.0	68.0	12.0	3.0
	35~39	232	8.2	65.5	19.4	6.9
	40~44	261	3.4	63.6	26.8	6.1
	45~49	317	1.9	65.9	25.6	6.6
	50~54	340	6.5	59.7	27.4	6.5
	55~59	224	4.0	57.6	28.6	9.8
	<b>Total</b>	<b>1979</b>	<b>10.4</b>	<b>63.9</b>	<b>20.2</b>	<b>5.5</b>

Table 3-3-3-7 Chest circumference (cm)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	20~24	187	88.5	6.64	78.7	79.4	83.4	87.4	92.6	96.7	104.2
	25~29	201	90.5	7.60	80.0	80.9	84.8	89.4	95.1	100.4	108.6
	30~34	195	92.0	7.23	80.4	82.2	86.4	91.8	96.2	102.0	107.1
	35~39	189	92.9	7.25	81.6	82.3	87.9	91.8	97.5	103.7	107.6
	40~44	178	93.5	7.13	80.0	82.2	88.7	93.9	97.9	102.9	108.6
	45~49	199	93.8	6.84	81.1	82.2	89.6	94.0	97.5	101.0	107.0
	50~54	219	92.2	6.39	81.3	82.8	87.8	91.7	96.0	100.6	106.8
	55~59	193	91.9	6.40	80.1	80.9	87.9	91.5	96.1	100.7	106.1
F	20~24	196	80.4	5.74	71.4	72.5	76.2	80.0	83.0	87.5	94.6
	25~29	209	79.9	5.33	71.6	73.0	76.6	79.2	82.1	86.5	94.5
	30~34	200	82.7	6.45	74.0	75.3	78.0	81.6	85.7	90.2	99.9
	35~39	232	84.4	6.63	73.8	74.7	80.0	83.4	88.5	93.0	99.6
	40~44	260	85.9	6.25	74.7	76.2	81.4	85.2	90.1	94.0	100.0
	45~49	317	85.9	6.21	76.2	77.0	81.2	85.7	89.9	94.1	100.1
	50~54	340	86.2	6.41	74.3	76.5	81.7	85.8	89.9	95.3	100.1
	55~59	224	86.7	6.94	74.6	75.8	81.5	86.7	90.8	95.9	101.3

Table 3-3-3-8 Waist circumference (cm)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	20~24	187	78.7	9.07	65.6	66.6	70.9	77.4	85.5	90.3	100.4
	25~29	201	80.6	9.65	65.6	67.1	73.0	79.8	86.2	93.7	102.9
	30~34	195	82.0	8.62	68.4	69.3	75.6	81.9	87.9	92.8	102.0
	35~39	189	85.0	8.26	71.2	72.8	79.0	85.4	88.9	96.1	104.2
	40~44	178	85.2	8.54	67.8	70.0	78.8	85.1	90.7	96.4	101.5
	45~49	199	86.6	9.08	68.2	70.4	80.5	86.5	92.7	97.5	102.1
	50~54	219	85.4	8.66	70.0	71.4	80.0	85.0	90.5	96.9	100.9
	55~59	193	85.7	8.38	69.4	71.7	79.4	86.4	91.0	96.0	101.6
F	20~24	196	70.4	7.31	59.2	61.1	65.5	68.8	73.7	78.9	90.5
	25~29	209	70.1	7.02	59.0	61.0	65.9	69.0	73.5	78.2	87.8
	30~34	200	74.0	7.96	61.8	62.5	68.4	73.7	78.0	83.7	92.5
	35~39	232	76.7	8.71	63.0	64.1	70.2	75.7	82.6	87.7	98.0
	40~44	260	78.4	8.30	65.4	66.2	72.5	77.2	83.0	89.5	96.5
	45~49	317	79.4	8.05	66.7	67.5	73.1	79.1	85.1	90.0	95.4
	50~54	340	79.9	8.71	64.3	66.5	74.1	80.0	85.0	91.0	97.7
	55~59	224	81.4	9.13	65.7	67.9	74.7	81.0	87.6	92.4	101.1

Table 3-3-3-9 Hip circumference (cm)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	20~24	187	91.8	6.17	81.3	83.1	86.5	92.3	95.8	99.3	105.6
	25~29	201	93.2	7.14	82.0	83.6	88.0	92.8	96.5	102.8	111.2
	30~34	195	93.5	6.32	83.1	84.1	89.0	93.0	97.1	101.6	108.1
	35~39	189	94.3	5.99	84.2	85.4	89.4	94.8	98.0	101.3	108.1
	40~44	178	93.9	5.51	83.0	85.6	89.5	94.1	97.8	100.7	104.6
	45~49	199	93.7	5.70	83.6	84.1	89.9	93.6	97.5	101.0	104.0
	50~54	219	93.0	5.91	82.2	83.9	88.5	92.5	97.0	101.0	104.2
	55~59	193	92.5	5.62	83.3	84.0	88.7	92.5	95.8	99.7	105.6
F	20~24	196	89.4	6.14	79.6	80.4	85.5	89.0	92.7	98.0	103.6
	25~29	209	88.7	5.23	79.9	80.6	85.3	88.3	91.5	95.0	101.5
	30~34	199	90.4	6.19	81.0	82.0	85.8	90.0	93.7	97.0	103.4
	35~39	232	92.0	6.38	82.5	83.1	87.9	91.1	95.4	99.7	107.5
	40~44	260	92.4	5.88	81.9	83.2	88.9	91.8	96.0	99.1	104.3
	45~49	317	91.9	5.74	83.4	84.0	87.9	91.2	95.4	99.1	104.1
	50~54	340	91.7	6.01	81.6	83.0	87.7	91.3	95.3	99.4	103.1
	55~59	224	92.1	6.96	81.9	83.4	87.7	90.6	95.9	100.8	107.6

Table 3-3-3-10 Waist-Hip Ratio (WHR)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	20~24	187	0.855	0.060	0.757	0.758	0.808	0.853	0.898	0.931	0.975
	25~29	201	0.863	0.056	0.766	0.771	0.825	0.858	0.902	0.938	0.965
	30~34	195	0.876	0.054	0.777	0.795	0.838	0.868	0.909	0.957	0.982
	35~39	189	0.900	0.049	0.807	0.820	0.869	0.898	0.929	0.968	0.998
	40~44	178	0.905	0.056	0.798	0.811	0.865	0.911	0.946	0.965	1.018
	45~49	199	0.923	0.062	0.798	0.822	0.883	0.921	0.966	1.004	1.037
	50~54	219	0.918	0.059	0.810	0.822	0.880	0.916	0.956	0.995	1.030
	55~59	193	0.925	0.058	0.801	0.825	0.886	0.930	0.964	0.997	1.028
F	20~24	196	0.786	0.054	0.703	0.711	0.751	0.781	0.812	0.852	0.903
	25~29	209	0.790	0.051	0.705	0.716	0.751	0.787	0.821	0.856	0.894
	30~34	199	0.818	0.057	0.735	0.739	0.776	0.813	0.856	0.889	0.943
	35~39	232	0.833	0.059	0.728	0.744	0.788	0.830	0.870	0.908	0.963
	40~44	260	0.848	0.058	0.754	0.762	0.806	0.845	0.882	0.922	0.970
	45~49	317	0.863	0.059	0.742	0.769	0.821	0.861	0.905	0.937	0.972
	50~54	340	0.871	0.063	0.757	0.766	0.827	0.869	0.915	0.949	0.987
	55~59	224	0.883	0.062	0.767	0.781	0.838	0.883	0.925	0.966	1.007

Table 3-3-3-11 Shoulder width (cm)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	20~24	187	38.1	1.94	34.0	34.9	37.2	37.9	39.5	40.6	41.3
	25~29	201	38.9	2.07	34.5	36.0	37.5	38.8	40.2	41.4	43.2
	30~34	195	38.4	2.01	34.4	34.8	37.0	38.5	39.7	41.0	42.2
	35~39	189	38.4	1.86	34.9	35.3	37.1	38.3	39.8	40.5	42.0
	40~44	178	38.3	2.08	34.5	35.0	37.0	38.4	39.6	41.0	42.2
	45~49	199	38.1	1.93	34.2	34.8	36.9	38.0	39.5	40.5	41.4
	50~54	219	37.7	1.81	34.4	34.7	36.6	37.7	38.9	40.0	41.3
	55~59	193	36.9	1.84	33.7	34.2	35.7	37.0	38.1	39.3	40.0
F	20~24	196	34.4	1.67	31.2	31.5	33.5	34.5	35.4	36.4	37.4
	25~29	209	34.5	1.67	31.5	31.7	33.5	34.5	35.5	36.5	38.0
	30~34	200	34.8	1.63	31.3	32.0	33.8	34.9	35.8	36.7	38.0
	35~39	232	35.0	1.59	32.1	32.5	34.0	35.0	36.0	36.9	37.6
	40~44	260	35.1	1.82	32.0	32.2	34.1	35.1	36.1	37.0	38.0
	45~49	317	34.9	1.64	31.7	32.1	34.0	35.0	35.9	37.0	38.1
	50~54	340	34.6	1.74	31.5	32.0	33.6	34.8	35.7	36.6	37.3
	55~59	224	34.5	1.86	31.0	31.7	33.6	34.8	35.7	36.6	37.4

Table 3-3-3-12 Pelvis width (cm)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	20~24	187	26.9	1.68	24.0	24.5	25.7	26.8	28.2	29.0	30.2
	25~29	201	27.2	1.86	24.2	24.4	25.9	27.0	28.2	29.6	31.7
	30~34	195	27.1	1.46	24.5	24.8	26.0	27.3	28.2	29.0	30.4
	35~39	189	27.2	1.66	24.5	25.0	26.1	27.1	28.3	29.1	30.2
	40~44	178	27.3	1.60	24.4	24.6	26.1	27.4	28.4	29.3	30.8
	45~49	199	27.5	1.88	24.3	24.7	26.4	27.4	28.5	29.8	30.9
	50~54	219	27.2	1.77	24.1	24.4	26.1	27.0	28.3	29.3	30.7
	55~59	192	27.4	1.59	24.4	25.1	26.4	27.3	28.3	29.0	30.1
F	20~24	196	26.6	1.72	23.5	23.9	25.5	26.6	27.6	28.8	30.0
	25~29	209	26.5	1.52	24.0	24.3	25.5	26.4	27.4	28.3	29.9
	30~34	200	27.1	1.84	24.1	24.3	26.0	27.0	28.1	29.0	31.5
	35~39	232	27.6	1.56	24.7	25.0	26.4	27.7	28.5	29.5	30.5
	40~44	260	27.8	1.65	24.9	25.3	26.8	27.7	28.8	30.0	30.9
	45~49	317	27.9	1.69	24.8	25.1	26.7	28.0	28.8	29.9	31.1
	50~54	340	28.0	1.75	24.9	25.3	26.8	28.0	29.0	30.2	31.5
	55~59	224	28.4	2.12	24.7	25.4	27.2	28.3	29.5	30.7	33.6

Table 3-3-3-13 Upper arm skinfold thickness (mm)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	20~24	187	10.5	5.75	2.0	2.5	6.0	10.0	14.0	18.1	24.4
	25~29	200	10.5	5.90	1.0	2.0	6.0	10.0	14.4	18.0	23.0
	30~34	195	11.2	5.69	2.5	2.9	7.0	11.0	15.0	19.0	22.1
	35~39	189	12.0	5.80	2.5	4.0	7.0	12.0	16.0	20.0	24.7
	40~44	175	11.5	5.74	3.0	3.0	7.0	11.0	16.0	19.0	22.0
	45~49	196	10.5	5.67	1.5	2.0	6.5	9.8	14.5	18.0	23.0
	50~54	211	9.4	5.34	2.0	2.3	5.0	8.5	12.0	16.9	22.0
	55~59	188	9.1	5.20	1.3	2.0	5.0	8.0	11.5	17.0	21.0
F	20~24	196	19.1	6.80	8.0	9.9	14.5	18.0	23.5	29.2	34.1
	25~29	209	18.7	6.36	7.7	8.5	14.3	18.0	22.3	26.5	32.7
	30~34	200	20.5	6.67	9.5	10.0	16.0	19.5	24.9	28.0	37.9
	35~39	231	21.9	7.11	10.0	12.0	17.0	22.0	27.0	30.4	36.0
	40~44	260	22.2	6.67	10.0	10.5	17.5	23.0	27.0	30.0	34.0
	45~49	317	22.0	6.72	9.8	11.5	17.5	21.5	26.0	31.5	36.2
	50~54	339	22.3	6.75	9.2	11.0	17.5	22.5	27.0	31.0	35.5
	55~59	224	22.4	7.11	9.8	10.6	18.0	23.0	27.0	31.0	36.0

Table 3-3-3-14 Subscapular skinfold thickness (mm)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	20~24	187	14.2	7.13	4.5	5.5	9.0	12.0	18.0	23.6	30.4
	25~29	201	15.0	7.05	5.0	5.1	10.0	14.5	20.0	25.0	30.0
	30~34	195	16.1	6.88	4.8	6.0	11.5	15.5	20.5	26.0	31.0
	35~39	189	19.5	7.57	6.0	7.0	14.0	20.0	23.0	28.5	37.3
	40~44	178	18.5	7.57	6.0	7.0	12.4	18.0	24.1	28.6	32.6
	45~49	199	18.3	7.83	5.0	6.0	13.0	18.0	23.0	30.0	34.0
	50~54	219	17.0	7.45	4.5	5.5	12.0	16.0	22.0	27.0	30.0
	55~59	193	16.5	8.03	4.8	5.5	11.0	15.5	21.3	26.0	36.0
F	20~24	196	14.4	6.38	6.5	7.4	10.0	12.5	17.5	22.5	31.2
	25~29	207	14.2	6.15	5.5	5.7	9.0	13.5	17.5	22.6	28.0
	30~34	200	17.3	6.84	6.5	7.5	12.5	16.3	21.4	26.0	34.0
	35~39	232	19.0	8.04	7.0	8.0	13.0	18.0	24.5	29.0	35.0
	40~44	260	19.4	7.14	7.9	8.0	14.0	18.5	24.0	29.0	35.1
	45~49	317	19.9	7.43	7.5	8.5	15.0	19.0	24.5	30.6	35.5
	50~54	340	19.9	7.23	7.1	8.5	14.6	19.5	24.5	29.5	35.0
	55~59	224	20.0	7.59	5.8	7.5	14.1	20.0	25.5	30.0	34.0

Table 3-3-3-15 Abdominal skinfold thickness (mm)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	20~24	187	19.2	9.24	4.0	4.7	12.0	19.0	26.0	31.5	35.0
	25~29	201	19.6	8.78	3.0	5.1	12.8	20.0	26.5	30.0	34.5
	30~34	194	21.0	9.05	4.9	5.9	14.4	21.8	26.1	33.5	39.0
	35~39	189	24.3	8.09	7.5	9.0	19.8	25.0	29.5	33.0	40.0
	40~44	178	23.6	8.58	6.2	8.0	17.0	23.5	30.0	35.0	38.0
	45~49	199	24.1	9.23	8.0	8.5	17.0	25.0	31.0	36.0	41.0
	50~54	219	22.2	8.19	6.0	8.5	16.5	22.0	28.0	32.0	39.8
	55~59	193	21.6	7.93	7.0	8.4	16.0	21.0	27.5	32.0	37.2
F	20~24	196	21.7	8.56	8.0	9.5	15.0	21.0	26.5	33.0	41.0
	25~29	209	20.8	7.04	6.0	7.0	15.8	21.0	25.0	29.0	34.0
	30~34	200	23.6	7.74	10.0	11.5	18.1	23.0	28.0	33.0	38.5
	35~39	232	24.3	8.03	9.0	12.0	19.1	24.5	29.8	34.9	40.5
	40~44	260	25.2	7.41	10.9	12.5	20.0	25.5	30.0	34.0	38.0
	45~49	317	26.2	7.10	13.5	15.5	21.5	26.0	30.0	35.1	41.0
	50~54	340	26.5	7.55	12.0	14.1	22.0	26.5	31.0	36.5	40.4
	55~59	224	26.8	7.62	9.4	12.1	22.6	27.0	31.9	36.5	41.3

Table 3-3-3-16 Percentage body fat (%)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	20~24	187	15.9	5.70	7.9	8.5	11.4	15.1	18.8	24.4	27.9
	25~29	200	16.3	5.71	7.7	7.9	12.0	15.8	20.3	24.1	28.1
	30~34	195	17.2	5.54	8.1	8.8	13.4	16.5	20.5	24.6	29.1
	35~39	189	19.2	5.94	8.5	9.9	15.1	19.1	22.7	26.1	33.8
	40~44	175	18.5	5.88	8.7	9.1	13.4	18.8	22.7	26.4	29.7
	45~49	196	17.9	6.01	7.0	8.5	13.4	17.5	21.5	25.8	30.1
	50~54	211	16.8	5.62	7.6	8.4	13.0	16.0	19.8	24.1	28.7
	55~59	188	16.4	5.97	7.7	7.9	12.0	15.5	20.0	23.2	30.3
F	20~24	196	23.2	7.01	13.5	14.3	18.1	21.7	26.6	32.9	41.3
	25~29	207	22.9	6.54	12.1	12.8	18.4	21.9	26.1	31.3	37.1
	30~34	200	25.5	7.13	14.3	15.2	20.6	24.7	29.6	33.6	44.7
	35~39	231	27.4	8.17	14.9	16.0	21.4	26.1	32.4	37.1	45.6
	40~44	260	27.7	7.28	14.8	16.2	22.6	27.1	32.7	37.1	42.5
	45~49	317	27.9	7.55	16.1	16.8	23.3	26.7	32.4	38.4	44.2
	50~54	339	28.1	7.23	15.5	16.8	23.3	27.6	32.4	38.0	42.8
	55~59	224	28.2	7.66	13.7	15.5	23.3	28.0	33.3	37.7	43.0

Table 3-3-3-17 Lean body mass (kg)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	20~24	187	53.7	6.27	42.2	43.8	49.7	53.6	57.6	61.1	66.7
	25~29	200	55.3	7.85	44.0	45.0	50.0	53.6	59.8	65.2	71.5
	30~34	195	55.5	7.79	43.2	45.2	50.3	54.2	59.2	66.2	75.4
	35~39	189	55.9	6.83	44.5	45.4	50.7	55.4	60.3	64.3	69.3
	40~44	175	55.9	6.85	43.9	44.9	50.8	56.1	60.2	64.8	70.3
	45~49	196	56.0	6.50	44.4	45.8	51.4	55.4	59.8	64.5	68.9
	50~54	211	54.9	6.69	42.7	44.6	50.3	54.4	59.2	63.8	67.7
	55~59	188	54.4	6.17	44.1	45.5	50.1	53.9	58.2	62.4	68.2
F	20~24	196	39.3	4.42	31.6	32.7	36.3	38.5	41.9	45.8	49.5
	25~29	207	38.7	4.30	31.8	32.8	35.7	38.3	41.0	44.6	48.3
	30~34	200	39.2	4.55	31.9	32.3	36.0	39.2	42.0	44.9	48.9
	35~39	231	40.0	4.98	31.9	33.3	36.6	39.7	42.3	46.0	50.4
	40~44	260	40.8	4.75	32.8	34.3	37.6	40.5	43.9	46.8	50.2
	45~49	317	40.3	4.42	32.7	33.6	37.0	40.2	43.5	46.6	48.6
	50~54	339	39.9	4.57	32.5	33.1	36.4	39.6	42.6	45.5	49.0
	55~59	224	40.1	5.15	30.8	31.6	36.5	40.0	43.5	47.1	51.4

3.4. Physiological Function

Table 3-3-4-1 Resting pulse (times/min)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	20~24	187	74.1	8.85	58.0	60.0	68.0	74.0	80.0	86.0	94.0
	25~29	201	75.9	8.85	60.0	63.1	70.0	74.0	82.0	90.0	93.9
	30~34	195	74.2	7.97	60.0	62.0	68.0	74.0	80.0	84.0	88.0
	35~39	189	73.6	8.53	60.0	60.0	68.0	74.0	78.0	84.0	96.6
	40~44	178	75.8	9.61	60.0	63.0	68.0	76.0	82.0	88.0	95.8
	45~49	199	74.1	9.00	60.0	60.0	68.0	74.0	78.0	87.0	92.0
	50~54	219	74.4	8.58	60.0	62.0	68.0	74.0	78.0	86.0	96.8
	55~59	193	74.4	9.12	56.0	60.0	68.0	74.0	80.0	84.0	94.4
F	20~24	196	76.0	8.54	59.8	63.7	70.0	76.0	82.0	88.0	92.0
	25~29	209	75.9	7.66	64.0	66.0	72.0	76.0	80.5	86.0	92.0
	30~34	200	76.0	8.13	62.0	64.0	70.5	75.0	80.0	86.0	90.0
	35~39	232	73.8	7.55	60.0	62.0	68.0	73.5	78.0	84.0	90.0
	40~44	260	74.7	7.26	62.0	64.0	70.0	74.0	78.0	84.0	90.0
	45~49	317	73.7	7.48	60.0	62.0	68.0	74.0	78.0	84.0	90.0
	50~54	340	73.3	7.74	60.0	62.0	68.0	72.0	78.0	84.0	90.0
	55~59	224	72.8	7.55	60.0	60.0	68.0	72.0	78.0	82.0	88.5

**Table 3-3-4-2 Systolic pressure (mmHg)**

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	20~24	187	120.1	9.55	100.6	103.2	114.0	120.0	126.0	132.0	140.0
	25~29	201	121.7	11.84	100.2	106.0	114.0	120.0	130.0	133.6	145.9
	30~34	195	121.6	9.97	104.0	106.0	116.0	122.0	128.0	134.0	142.2
	35~39	189	123.2	10.59	106.2	108.0	116.0	122.0	128.0	136.0	150.0
	40~44	178	127.3	12.15	108.0	110.0	119.5	126.0	136.0	144.0	152.0
	45~49	199	128.4	12.36	108.0	110.0	120.0	126.0	136.0	146.0	154.0
	50~54	219	128.9	12.55	107.2	110.0	120.0	128.0	138.0	142.0	154.8
	55~59	193	130.6	14.60	106.0	108.0	120.0	130.0	140.0	150.0	162.0
F	20~24	196	109.8	9.27	93.8	96.0	104.0	110.0	116.0	122.0	130.0
	25~29	209	109.4	9.10	91.2	95.0	102.5	110.0	116.0	120.0	129.4
	30~34	200	111.1	10.47	94.0	96.0	104.0	110.0	116.0	124.0	136.0
	35~39	232	113.0	10.77	92.0	94.7	108.0	112.0	119.5	126.0	132.0
	40~44	261	115.9	11.70	96.0	98.0	108.0	116.0	124.0	132.0	140.3
	45~49	317	119.0	12.92	97.1	100.0	110.0	118.0	128.0	134.2	148.9
	50~54	340	122.5	14.18	98.0	100.0	114.0	122.0	130.0	140.0	151.5
	55~59	224	124.9	14.29	101.5	104.0	116.0	123.0	132.0	146.0	156.5

**Table 3-3-4-3 Diastolic pressure (mmHg)**

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	20~24	187	75.0	6.88	60.0	62.8	70.0	76.0	80.0	84.0	88.0
	25~29	201	75.7	6.99	62.0	64.0	70.0	76.0	80.0	85.8	90.0
	30~34	195	76.0	8.19	61.8	64.0	70.0	76.0	80.0	88.0	92.0
	35~39	189	78.5	7.29	68.0	70.0	72.0	80.0	82.0	90.0	95.3
	40~44	177	80.1	7.88	66.0	68.0	74.0	80.0	86.0	90.0	95.7
	45~49	199	81.8	8.55	64.0	68.0	76.0	80.0	88.0	92.0	98.0
	50~54	218	81.0	8.48	67.1	70.0	74.0	80.0	88.0	92.0	98.0
	55~59	193	81.7	8.55	66.0	70.0	76.0	82.0	88.0	91.2	96.4
F	20~24	196	68.4	6.93	58.0	60.0	62.0	68.0	73.5	78.0	84.1
	25~29	209	69.3	6.91	58.0	60.0	64.0	70.0	74.0	78.0	82.0
	30~34	200	70.6	7.58	58.1	60.0	65.0	70.0	76.0	80.0	89.9
	35~39	232	71.9	7.62	60.0	60.0	68.0	70.0	78.0	80.0	90.0
	40~44	261	72.8	7.58	60.0	60.0	70.0	70.0	78.0	80.0	90.0
	45~49	317	75.0	8.35	60.0	61.8	70.0	76.0	80.0	86.0	92.0
	50~54	340	75.7	9.20	60.0	60.0	70.0	74.0	80.0	89.8	95.8
	55~59	224	76.8	8.60	60.0	62.0	70.0	78.0	80.0	88.0	94.5



Table 3-3-4-4 Pressure difference (mmHg)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	20~24	187	45.1	9.58	28.0	30.8	38.0	42.0	52.0	58.0	64.7
	25~29	201	46.0	10.67	30.0	30.0	38.0	44.0	52.0	59.6	65.9
	30~34	195	45.6	9.10	30.0	31.6	38.0	44.0	52.0	58.0	64.0
	35~39	189	44.7	8.59	30.0	32.0	38.0	44.0	50.0	56.0	61.2
	40~44	177	47.1	9.72	32.0	32.0	40.0	46.0	53.5	60.0	63.3
	45~49	199	46.6	10.27	30.0	32.0	40.0	46.0	52.0	62.0	72.0
	50~54	218	47.9	9.84	30.0	32.0	42.0	46.0	56.0	62.0	66.0
	55~59	193	48.9	11.15	29.6	32.0	40.0	48.0	56.0	65.2	72.4
F	20~24	196	41.3	7.88	27.9	30.0	36.0	42.0	46.0	52.0	58.0
	25~29	209	40.1	7.69	24.0	28.0	34.0	40.0	44.0	50.0	54.0
	30~34	200	40.5	8.55	24.0	28.0	34.3	40.0	46.0	52.0	58.0
	35~39	232	41.1	8.11	28.0	29.3	36.0	40.0	46.0	52.0	58.0
	40~44	261	43.1	9.16	27.7	28.0	36.0	42.0	48.0	54.0	62.0
	45~49	317	43.9	9.17	28.0	30.0	38.0	44.0	50.0	54.0	64.0
	50~54	340	46.8	10.54	30.0	32.0	40.0	46.0	54.0	60.0	68.0
	55~59	224	48.1	11.83	31.5	32.0	40.0	46.0	54.0	64.0	73.0

Table 3-3-4-5 Vital capacity (ml)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	20~24	187	3865.1	685.43	2816.0	2918.4	3385.0	3746.0	4261.0	4764.0	5319.6
	25~29	201	3981.7	798.02	2448.1	2622.0	3522.0	3965.0	4437.0	4976.6	5722.5
	30~34	195	4008.2	820.33	2325.0	2816.2	3460.0	4025.0	4525.0	5097.0	5544.9
	35~39	189	3793.4	817.58	2022.5	2227.0	3311.0	3865.0	4287.5	4755.0	5258.5
	40~44	177	3698.1	671.85	2248.8	2770.7	3298.5	3672.0	4157.5	4496.0	5008.3
	45~49	199	3431.9	763.78	2008.0	2215.0	2938.0	3354.0	3872.0	4475.0	5050.0
	50~54	219	3363.3	701.27	2043.2	2191.0	2911.0	3317.0	3773.0	4313.0	4859.8
	55~59	193	3215.9	695.18	1924.4	2131.9	2774.5	3220.0	3590.0	4101.2	4760.5
F	20~24	196	2666.9	542.35	1607.8	1831.8	2308.0	2615.0	3014.5	3398.6	3683.7
	25~29	209	2660.2	612.67	1473.0	1650.5	2290.0	2643.0	3045.0	3406.0	3743.7
	30~34	200	2626.2	585.77	1497.2	1722.7	2225.3	2647.5	3013.8	3329.0	3757.3
	35~39	231	2621.5	550.27	1672.6	1760.2	2287.0	2600.0	2919.0	3364.0	3759.3
	40~44	261	2516.8	573.64	1605.8	1699.1	2117.0	2480.0	2850.0	3218.0	3903.5
	45~49	314	2363.2	582.93	1228.2	1396.0	2034.5	2332.0	2711.3	3075.0	3326.5
	50~54	340	2224.2	578.65	1090.4	1176.9	1845.0	2222.5	2540.0	2904.5	3398.6
	55~59	223	2142.2	547.65	1175.7	1338.8	1770.0	2150.0	2427.0	2666.2	3402.5

Table 3-3-4-6 Vital capacity/weight (ml/kg)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	20~24	187	60.8	10.76	39.4	40.6	54.6	61.6	67.0	74.7	80.4
	25~29	201	60.8	12.79	35.3	41.5	53.0	61.6	68.4	74.7	86.7
	30~34	195	60.3	12.69	36.6	40.5	51.0	60.5	69.3	76.6	81.9
	35~39	189	55.2	12.32	31.2	34.8	48.3	55.1	62.9	71.0	78.0
	40~44	177	54.4	11.64	31.9	35.6	46.9	53.9	61.8	68.5	79.5
	45~49	199	50.8	12.64	30.6	32.5	41.7	49.5	58.4	69.2	75.5
	50~54	219	51.4	11.06	30.2	32.1	44.6	50.9	58.6	66.3	72.3
	55~59	193	50.0	12.05	28.5	32.4	43.2	49.4	57.1	63.7	74.5
F	20~24	196	52.3	10.56	31.9	34.7	45.1	52.5	59.1	64.4	72.3
	25~29	209	53.1	11.34	30.8	35.8	45.9	52.8	59.3	66.3	74.7
	30~34	200	49.8	10.68	29.5	33.3	42.9	49.7	55.9	64.5	69.7
	35~39	231	48.0	11.40	29.4	31.7	39.7	48.1	55.3	61.4	69.8
	40~44	261	44.9	11.19	25.1	27.1	36.9	44.6	52.1	57.6	71.2
	45~49	314	42.6	11.91	21.7	24.9	35.0	41.8	49.9	58.0	65.8
	50~54	340	40.5	11.66	19.0	21.5	32.5	40.7	47.4	54.8	65.9
	55~59	223	38.8	10.95	21.1	22.9	30.4	38.8	44.4	53.3	60.6

Table 3-3-4-7 Step test index

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	20~24	187	53.4	7.33	41.0	45.0	48.4	52.6	57.7	62.6	70.8
	25~29	199	53.0	7.92	42.5	45.0	46.9	50.8	57.3	65.2	72.6
	30~34	191	53.9	8.22	42.7	45.5	48.4	52.0	57.3	64.2	75.3
	35~39	187	54.9	8.41	41.1	45.2	49.7	53.9	59.6	65.4	74.2
	40~44	176	55.8	9.17	42.3	45.3	48.7	54.8	62.5	67.7	75.1
	45~49	194	56.8	9.03	43.0	45.8	50.5	55.0	62.5	70.3	75.0
	50~54	208	58.3	11.64	38.4	46.6	50.8	56.8	64.2	72.2	84.7
	55~59	186	58.3	11.09	40.6	44.5	51.4	56.6	65.2	72.0	82.1
F	20~24	195	54.1	7.36	43.9	45.7	49.2	52.9	58.1	64.3	69.5
	25~29	207	55.6	9.13	43.5	47.3	50.6	54.5	59.2	66.2	72.6
	30~34	198	56.3	9.93	38.6	45.9	50.6	56.1	62.1	68.2	77.0
	35~39	230	57.5	8.60	45.0	48.2	52.3	56.3	62.2	68.7	75.8
	40~44	258	58.5	10.46	36.8	47.3	52.0	58.1	65.2	72.0	78.4
	45~49	303	60.4	11.51	36.4	48.9	54.2	59.2	66.8	74.8	83.9
	50~54	329	62.6	11.77	38.0	49.3	55.2	61.6	69.8	76.9	86.7
	55~59	210	61.8	11.97	39.3	50.3	55.5	60.4	68.2	78.1	85.4

3.5. Physical Fitness

Table 3-3-5-1 Vertical jump (cm)

Gender	Age group(year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	20~24	187	38.3	8.55	24.2	25.4	31.5	38.0	44.1	51.0	55.0
	25~29	201	38.8	8.17	19.1	24.7	34.0	39.6	43.8	48.4	54.5
	30~34	194	37.1	7.93	19.9	25.4	31.9	37.2	42.0	47.5	53.5
	35~39	188	35.8	7.47	18.6	20.6	31.5	35.7	40.7	45.2	50.1
F	20~24	196	23.9	5.42	15.4	16.3	20.1	23.5	26.5	30.0	38.9
	25~29	207	24.3	4.33	17.0	17.9	21.2	24.4	27.2	29.9	33.0
	30~34	198	23.2	4.91	13.2	15.8	19.7	23.0	26.4	30.1	33.5
	35~39	229	22.6	5.51	14.9	15.4	19.1	22.2	25.2	28.2	32.5

Table 3-3-5-2 Push-ups (M)/ One-minute sit-ups (F) (times)

Gender	Age group(year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	20~24	187	24.6	11.18	4.6	8.4	16.0	22.0	33.0	39.2	45.7
	25~29	200	25.8	12.32	5.1	8.0	17.3	22.0	33.0	43.0	50.0
	30~34	192	25.0	15.47	5.0	5.7	15.0	21.5	30.0	48.5	60.2
	35~39	187	23.5	12.66	6.0	8.4	15.0	20.0	30.0	40.2	54.9
F	20~24	196	23.6	8.95	4.0	9.4	19.0	24.0	29.0	35.0	42.0
	25~29	207	22.7	8.51	1.0	8.0	18.0	23.0	28.0	32.0	38.0
	30~34	198	19.3	8.00	0.0	6.0	14.0	20.0	25.0	29.0	36.0
	35~39	230	17.0	8.94	0.0	0.0	11.0	19.0	22.0	27.0	34.1

Table 3-3-5-3 Grip strength (kg)

Gender	Age group(year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	20~24	187	38.9	7.26	25.8	26.2	33.4	38.9	43.0	49.5	52.7
	25~29	201	39.5	8.29	21.8	25.4	34.2	39.6	45.3	51.2	54.5
	30~34	195	41.9	8.83	27.2	29.3	36.3	41.4	47.4	51.2	56.4
	35~39	189	42.9	7.59	27.1	30.1	38.7	42.4	47.8	52.8	58.2
	40~44	178	41.5	7.85	27.3	30.0	36.0	41.1	47.0	52.6	55.6
	45~49	198	40.5	7.12	24.0	27.4	36.4	40.5	44.7	49.7	54.3
	50~54	219	39.1	7.68	23.9	26.5	34.3	39.1	44.3	49.7	53.8
	55~59	193	38.6	7.17	24.4	27.6	33.2	39.3	43.5	47.9	51.5
F	20~24	196	22.6	4.67	14.3	15.4	19.9	22.5	25.2	28.3	31.9
	25~29	209	22.7	4.72	13.3	14.8	19.6	22.8	25.5	29.3	31.3
	30~34	200	22.7	4.70	15.3	15.9	19.0	22.1	25.9	29.2	33.1
	35~39	232	23.6	4.72	16.6	17.4	20.1	23.4	26.2	29.7	32.8
	40~44	260	24.0	4.88	15.2	16.3	20.4	24.2	27.4	30.6	32.6
	45~49	316	23.0	5.01	14.8	15.6	19.3	22.7	26.2	29.7	32.8
	50~54	338	21.9	4.69	13.7	15.0	18.7	21.6	25.2	27.8	31.2
	55~59	221	21.5	4.41	13.4	14.2	18.3	21.0	24.3	27.2	30.6

Table 3-3-5-4 Back strength (kg)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	20~24	187	103.6	20.12	63.6	69.4	91.0	104.0	116.0	128.4	144.1
	25~29	201	104.1	21.24	61.0	71.1	90.0	103.0	117.5	131.0	142.9
	30~34	194	107.9	25.06	65.3	71.3	93.0	108.0	123.0	135.5	149.8
	35~39	189	109.0	22.60	61.1	70.5	97.0	110.0	124.5	135.0	152.0
F	20~24	196	55.2	15.01	31.8	33.9	43.3	54.5	64.8	75.0	89.0
	25~29	208	55.5	15.25	30.0	32.0	46.0	53.0	66.0	73.0	87.2
	30~34	196	55.9	13.34	30.9	35.9	47.0	55.0	63.8	73.6	86.0
	35~39	231	58.4	15.99	32.9	35.0	47.0	57.0	68.0	78.8	90.0

Table 3-3-5-5 Sit and reach (cm)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	20~24	187	3.2	8.66	-14.9	-13.4	-3.4	4.8	9.0	12.8	19.9
	25~29	201	2.8	8.73	-14.5	-11.8	-2.9	4.1	9.3	12.6	17.5
	30~34	194	1.5	8.94	-15.2	-14.3	-4.8	2.2	8.1	12.5	18.4
	35~39	189	2.3	8.45	-14.5	-12.2	-3.1	2.2	8.0	13.2	17.6
	40~44	176	2.2	7.83	-13.3	-12.6	-3.1	2.7	7.3	12.7	15.9
	45~49	199	1.9	8.18	-15.6	-12.6	-4.0	2.1	7.8	12.0	16.3
	50~54	216	2.7	9.28	-14.6	-12.7	-4.2	2.6	10.8	15.5	19.2
	55~59	192	1.0	9.15	-16.6	-15.0	-5.5	2.1	8.4	12.1	16.8
F	20~24	196	6.1	9.77	-16.1	-13.4	0.7	7.3	13.1	18.5	22.6
	25~29	207	6.4	9.01	-10.3	-8.7	0.3	6.7	12.9	18.1	22.9
	30~34	198	4.8	8.05	-9.9	-9.6	-0.8	5.4	10.9	14.6	18.9
	35~39	232	5.8	9.18	-11.4	-9.5	0.2	6.0	12.5	17.3	21.5
	40~44	258	5.5	8.88	-12.6	-9.4	-0.5	5.5	12.7	16.5	20.1
	45~49	312	5.3	8.91	-12.4	-11.2	-0.6	5.9	11.7	16.4	21.3
	50~54	336	5.4	8.89	-13.6	-11.1	-0.2	5.1	11.5	17.3	21.9
	55~59	219	6.3	9.29	-13.1	-11.4	0.2	6.5	13.6	17.8	22.9

Table 3-3-5-6 Respond time (sec)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	20~24	187	0.41	0.057	0.32	0.33	0.37	0.41	0.45	0.50	0.54
	25~29	201	0.41	0.055	0.31	0.33	0.37	0.41	0.44	0.49	0.53
	30~34	195	0.42	0.058	0.34	0.35	0.37	0.41	0.45	0.49	0.53
	35~39	189	0.41	0.059	0.33	0.34	0.38	0.41	0.45	0.48	0.51
	40~44	178	0.43	0.071	0.33	0.35	0.39	0.42	0.46	0.51	0.58
	45~49	198	0.43	0.060	0.34	0.35	0.39	0.43	0.47	0.51	0.57
	50~54	218	0.45	0.076	0.33	0.35	0.40	0.44	0.48	0.53	0.62
	55~59	191	0.47	0.074	0.36	0.37	0.42	0.45	0.50	0.56	0.64
F	20~24	196	0.43	0.072	0.33	0.33	0.38	0.42	0.47	0.54	0.58
	25~29	209	0.44	0.059	0.35	0.35	0.40	0.43	0.48	0.52	0.57
	30~34	200	0.45	0.064	0.36	0.37	0.40	0.44	0.48	0.52	0.58
	35~39	232	0.45	0.067	0.35	0.37	0.41	0.44	0.48	0.54	0.58
	40~44	259	0.47	0.072	0.36	0.37	0.41	0.45	0.50	0.56	0.62
	45~49	315	0.49	0.093	0.36	0.37	0.43	0.47	0.53	0.60	0.73
	50~54	338	0.49	0.096	0.37	0.38	0.43	0.48	0.53	0.61	0.72
	55~59	223	0.51	0.099	0.37	0.38	0.44	0.49	0.55	0.62	0.73

Table 3-3-5-7 One foot stands with eyes closed (sec)

Gender	Age group (year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	20~24	187	43.2	38.51	5.0	6.0	14.0	30.0	61.0	98.2	157.2
	25~29	201	44.3	49.13	4.0	4.0	14.5	26.0	55.5	110.6	179.2
	30~34	195	38.7	41.14	4.0	5.0	12.0	24.0	47.0	84.6	160.4
	35~39	189	38.1	39.38	4.7	5.0	13.0	29.0	48.0	78.0	124.9
	40~44	177	31.3	40.43	3.0	4.0	9.0	18.0	38.0	73.2	125.3
	45~49	199	30.6	45.31	3.0	4.0	8.0	17.0	37.0	67.0	113.0
	50~54	218	22.9	26.44	3.0	3.0	7.0	13.0	27.0	59.0	106.4
	55~59	193	18.8	19.85	3.0	3.0	6.0	13.0	23.0	40.6	66.2
F	20~24	196	43.5	38.25	6.0	6.9	17.0	31.0	59.5	95.3	147.7
	25~29	209	47.8	41.58	5.0	6.5	16.5	34.0	68.0	107.0	149.8
	30~34	200	36.5	39.37	5.0	5.0	12.0	23.5	44.0	81.0	147.7
	35~39	232	37.6	37.45	3.0	4.0	13.0	26.0	48.0	78.0	145.1
	40~44	261	28.9	29.15	4.0	4.1	9.0	18.0	40.0	69.0	106.0
	45~49	315	20.5	22.44	3.0	3.0	8.0	14.0	24.0	44.4	80.6
	50~54	340	17.9	23.82	3.0	3.0	6.0	10.0	20.0	39.0	70.2
	55~59	223	13.0	15.84	2.0	3.0	5.0	9.0	14.0	26.0	42.1

## 4. Seniors

### 4.1. Basic Information of the Subjects

Table 3-4-1-1 Distribution of sampling sites (senior centers)

Survey areas	Sampling sites (Senior centers)	M		F		Total	
		Subjects (n)	Percentage (%)	Subjects (n)	Percentage (%)	Subjects (n)	Percentage (%)
North	Centro de Dia da Ilha Verde	0	0.0	1	0.3	1	0.2
	Asilo de Betânia	3	1.5	0	0.0	3	0.5
	Centro de Convívio Fai Chi Kei , Centro de Convívio "Kei Hong Lok Yuen" do Centro Pastoral da Areia Preta	2	1.0	4	1.0	6	1.0
	Centro I Chon da União Geral das Associações dos Moradores de Macau, Associação de Amizade dos Moradores da Zona de Nordeste de Macau, Centro Comunitário de Iao Hon, Centro de Apoio aos Idosos da União Geral das Associações dos Moradores de Macau	8	3.9	21	5.4	29	4.9
	Centro de Convívio "Clube de Terceira Idade	1	0.5	6	1.5	7	1.2
Central	Casa para Anciãos da Paróquia de Santo António	0	0.0	2	0.5	2	0.3
	Centro de Convívio da Associação de Mútuo Auxílio dos Moradores do Bairro de San Kio	0	0.0	4	1.0	4	0.7
South& outlying islands	Centro de Dia do Porto Interior	3	1.5	8	2.1	11	1.9
	Centro de Convívio "Missão Luterana de Hong Kong e Macau / Centro de Terceira Idade Yan Kei"	0	0.0	5	1.3	5	0.8
	Centro de Cuidados Especiais Longevidade (Serviço de Apoio Domiciliário)	0	0.0	4	1.0	4	0.7
	União Geral das Associações dos Idosos de Macau	7	3.4	40	10.3	47	8.0
	Centro de Serviço aos Empregados da Praça de Ponte e Horta	5	2.5	18	4.6	23	3.9
	Macao Polytechnic Institute - Seniors Academy Instituto Politécnico de Macau - Academia do Cidadão Sénior	25	12.3	38	9.8	63	10.7
Others	Associação das Idosas de Fu Lun de Macau	1	0.5	30	7.7	31	5.2
	Centro de Dia da Praia do Manduco	0	0.0	2	0.5	2	0.3
	Individuals aged over 60 years old working in the sampling institutions of adults	136	67.0	162	41.8	298	50.4
Supplementary (North)	Centro de Dia de Mong - Há	11	5.4	9	2.3	20	3.4
(Central)	Centro de Convívio Casa dos "Pinheiros"	0	0.0	18	4.6	18	3.0
(South & outlying islands)	Centro de Lazer e Recreação dos Anciãos da União Geral das Associações dos Moradores de Macau	0	0.0	7	1.8	7	1.2
	Centro de Convívio da Associação dos Habitantes das Ilhas Kuan Iek	1	0.5	9	2.3	10	1.7
<b>Total</b>		<b>203</b>	<b>100</b>	<b>388</b>	<b>100</b>	<b>591</b>	<b>100</b>

**Table 3-4-1-2 Residential distribution of subjects (%)**

Communities	M	F	Total
S.Francisco	0.5	0.8	<b>0.7</b>
Na.Sra.do Carmo	16.3	13.4	<b>14.4</b>
S.Lourenço	14.3	12.1	<b>12.9</b>
Sé Catedral	9.9	11.3	<b>10.8</b>
S.António	25.1	25.0	<b>25.0</b>
S.Lázaro	8.4	11.3	<b>10.3</b>
Na.Sra.de Fátima	25.6	26.0	<b>25.9</b>

**Table 3-4-1-3 Birth place (%)**

Gender	Birth Place	Aged 60~64	Aged 65~69	Total
M	Mainland	46.8	63.8	<b>54.7</b>
	Macao	39.4	19.1	<b>30.0</b>
	Hong Kong	2.8	3.2	<b>3.0</b>
	Portugal	3.7	0.0	<b>2.0</b>
	Others	7.3	13.8	<b>10.3</b>
F	Mainland	62.6	73.8	<b>66.2</b>
	Macao	30.5	17.5	<b>26.3</b>
	Hong Kong	1.1	1.6	<b>1.3</b>
	Portugal	0.4	0.0	<b>0.3</b>
	Others	5.3	7.1	<b>5.9</b>

**Table 3-4-1-4 Education (%)**

Gender	Education	Aged 60~64	Aged 65~69	Total
M	Below primary school level	5.5	10.6	<b>7.9</b>
	Primary school	28.4	24.5	<b>26.6</b>
	Secondary school	51.4	42.6	<b>47.3</b>
	University or professional college	10.1	22.3	<b>15.8</b>
	Master	3.7	0.0	<b>2.0</b>
	Doctoral	0.9	0.0	<b>0.5</b>
F	Below primary school level	15.6	17.5	<b>16.2</b>
	Primary school	39.7	34.1	<b>37.9</b>
	Secondary school	37.4	38.1	<b>37.6</b>
	University or professional college	7.3	10.3	<b>8.2</b>

Table 3-4-1-5 Occupation before retirement (%)

Gender	Category	Occupation before retirement	Aged 60~64	Aged 65~69	Total
M	Labour intensive	Professionals	0.0	2.1	1.0
		Technician or professional assistants	2.8	1.1	2.0
		Customer service or salesmen	10.1	12.7	11.3
		Experienced workers in the fishery and agriculture fields	0.0	1.1	0.5
		Artisan or handicraftsmen	14.7	24.5	19.2
		Machine operators, drivers or assemblers	13.7	3.2	8.9
		Non-technicians	3.7	8.5	5.9
		Others	9.1	6.4	7.9
		<b>Total</b>	<b>54.1</b>	<b>59.6</b>	<b>56.7</b>
	Non labour intensive	Professionals	11.9	5.3	8.9
		Technician or professional assistants	3.7	3.2	3.4
		Customer service or salesmen	5.5	3.2	4.4
		Artisan or handicraftsmen	4.6	4.2	4.4
		Machine operators, drivers or assemblers	3.7	1.1	2.5
		Non-technicians	1.8	2.1	2.0
		Others	6.4	4.2	5.4
		Legislative officers, public administration officers, community directors or managers	0.9	4.2	2.5
		Office clerks	6.4	12.8	9.4
		Unemployed	0.9	0.0	0.5
			<b>Total</b>	<b>45.9</b>	<b>40.4</b>
F		Labour intensive	Professionals	1.1	1.6
	Technician or professional assistants		1.9	1.6	1.8
	Customer service or salesmen		12.6	8.7	11.3
	Artisan or handicraftsmen		13.7	15.9	14.4
	Non-technicians		14.1	11.1	13.2
	Others		6.5	4.0	5.7
	Office clerks		0.8	0.8	0.8
	Household duties		9.2	8.7	9.0
		<b>Total</b>	<b>59.9</b>	<b>52.4</b>	<b>57.5</b>
	Non labour intensive	Professionals	4.2	3.2	3.9
		Technician or professional assistants	3.4	4.8	3.9
		Customer service or salesmen	3.8	1.6	3.1
		Artisan or handicraftsmen	10.7	18.2	13.1
		Non-technicians	0.8	0.0	0.5
Others		2.7	4.8	3.4	
Legislative officers, public administration officers, community directors or managers	1.2	0.8	1.0		
Office clerks	9.5	8.7	9.3		
Household duties	3.8	5.6	4.4		
	<b>Total</b>	<b>40.1</b>	<b>47.6</b>	<b>42.5</b>	



**Table 3-4-1-6 Working environment before retirement (%)**

Gender	Working environment before retirement	Aged 60~64	Aged 65~69	Total
M	Outdoor	31.5	24.5	<b>28.2</b>
	Indoors (naturally ventilated)	32.4	38.3	<b>35.1</b>
	Indoors (air conditioned)	36.1	37.2	<b>36.6</b>
F	Outdoor	3.1	4.8	<b>3.6</b>
	Indoors (naturally ventilated)	48.7	54.8	<b>50.6</b>
	Indoors (air conditioned)	48.3	40.5	<b>45.7</b>

**Table 3-4-1-7 Average working hours per week (%)**

Gender	Working hours(hrs)	Aged 60~64	Aged 65~69	Total
M	Unemployed	28.4	72.3	<b>48.8</b>
	Within 20	10.1	5.3	<b>7.9</b>
	20~35	8.3	6.4	<b>7.4</b>
	35~40	22.9	2.1	<b>13.3</b>
	40~50	22.0	8.5	<b>15.8</b>
	50 or more	8.3	5.3	<b>6.9</b>
F	Unemployed	48.1	65.9	<b>53.9</b>
	Within 20	13.7	13.5	<b>13.7</b>
	20~35	13.0	9.5	<b>11.9</b>
	35~40	8.8	4.0	<b>7.2</b>
	40~50	10.7	4.0	<b>8.5</b>
	50 or more	5.7	3.2	<b>4.9</b>

**4.2. Lifestyle**

**Table 3-4-2-1 Average sleeping hours per day (%)**

Gender	Age group (year)	Subjects (n)	Below 6 hrs	6~9 hrs	9 hrs or more
M	60~64	108	19.4	75.9	4.6
	65~69	94	23.4	74.5	2.1
F	60~64	260	26.5	69.2	4.2
	65~69	125	37.6	59.2	3.2
<b>Total</b>		<b>587</b>	<b>27.1</b>	<b>69.2</b>	<b>3.7</b>

**Table 3-4-2-2 Quality of sleep (%)**

Gender	Age group(year)	Subjects (n)	Poor	Reasonable	Good
M	60~64	109	12.8	58.7	28.4
	65~69	94	10.6	58.5	30.9
F	60~64	262	19.8	54.2	26.0
	65~69	126	19.8	55.6	24.6
<b>Total</b>		<b>591</b>	<b>17.1</b>	<b>56.0</b>	<b>26.9</b>

**Table 3-4-2-3 Average walking hours per day (%)**

Gender	Age group (year)	Subjects (n)	Below 30 mins	30~60 mins	1~2 hrs	2 hrs or more
M	60~64	109	29.4	36.7	25.7	8.3
	65~69	94	26.6	40.4	16.0	17.0
F	60~64	262	18.7	36.3	26.3	18.7
	65~69	126	19.0	31.0	26.2	23.8
<b>Total</b>		<b>591</b>	<b>22.0</b>	<b>35.9</b>	<b>24.5</b>	<b>17.6</b>

**Table 3-4-2-4 Average sitting hours per day (%)**

Gender	Age group (year)	Subjects (n)	Below 3 hrs	3~6 hrs	6~9 hrs	9~12 hrs	12 hrs or more
M	60~64	109	27.5	43.1	23.9	4.6	0.9
	65~69	94	26.6	53.2	12.8	7.4	0.0
F	60~64	262	31.3	53.8	10.7	3.1	1.1
	65~69	126	38.1	47.6	11.1	3.2	0.0
<b>Total</b>		<b>591</b>	<b>31.3</b>	<b>50.4</b>	<b>13.5</b>	<b>4.1</b>	<b>0.7</b>

**Table 3-4-2-5 Cigarette Consumption (%)**

Gender	Age group (year)	Subjects (n)	Smokers	Less than 10 per day	10~20 per day	At least 20 per day	Quit smoking for less than 2 years	Quit smoking for at least 2 years
M	60~64	109	29	13.8	31.1	20.7	0.0	34.5
	65~69	94	32	21.9	15.6	9.4	9.4	43.8
F	60~64	262	2	0.0	0.0	0.0	50.0	50.0
	65~69	126	1	100.0	0.0	0.0	0.0	0.0
<b>Total</b>		<b>591</b>	<b>64</b>	<b>18.8</b>	<b>21.9</b>	<b>14.1</b>	<b>6.3</b>	<b>39.1</b>

**Table 3-4-2-6 Duration of smoking (%)**

Gender	Age group (year)	Smokers	Less than 5 years	5~10 years	10~15 years	15 years or more
M	60~64	29	3.4	10.3	3.4	82.8
	65~69	32	6.3	3.1	18.8	71.9
F	60~64	2	0.0	0.0	0.0	100.0
	65~69	1	0.0	0.0	0.0	100.0
<b>Total</b>		<b>64</b>	<b>4.7</b>	<b>6.3</b>	<b>10.9</b>	<b>78.1</b>

**Table 3-4-2-7 Alcohol consumption (%)**

Gender	Age group (year)	Subjects (n)	Non-drinkers	Drinkers
M	60~64	109	63.3	36.7
	65~69	94	63.8	36.2
F	60~64	262	90.5	9.5
	65~69	126	90.5	9.5
<b>Total</b>		<b>591</b>	<b>81.2</b>	<b>18.8</b>

Table 3-4-2-8 Frequency of drinking (%)

Gender	Age group (year)	Drinkers	Once every month	1~2 times per week	3~4 times per week	5~7 times per week
M	60~64	40	50.0	15.0	10.0	25.0
	65~69	34	38.2	41.2	2.9	17.6
F	60~64	25	56.0	8.0	12.0	24.0
	65~69	12	91.7	8.3	0.0	0.0
<b>Total</b>		<b>111</b>	<b>52.3</b>	<b>20.7</b>	<b>7.2</b>	<b>19.8</b>

Table 3-4-2-9 Types of alcohol consumed (%)

Gender	Age group (year)	Drinkers	Liquor	Beer	Rice wine	Wine or fruit wine	Mixed
M	60~64	39	2.6	61.5	2.6	20.5	12.8
	65~69	34	5.9	52.9	2.9	32.4	5.9
F	60~64	25	0.0	12.0	8.0	80.0	0.0
	65~69	12	0.0	0.0	25.0	75.0	0.0
<b>Total</b>		<b>110</b>	<b>2.7</b>	<b>40.9</b>	<b>6.4</b>	<b>43.6</b>	<b>6.4</b>

Table 3-4-2-10 Activities during leisure time (%)

Gender	Age group (year)	Subjects (n)	Physical exercise	Chess	Traveling	Social gathering	AV entertainment	House chores	Sleeping	Others
M	60~64	109	55.0	9.2	16.5	29.4	61.5	39.4	16.5	15.6
	65~69	94	41.5	11.7	5.3	19.1	57.4	30.9	14.9	18.1
F	60~64	262	53.1	4.6	8.8	20.2	57.6	75.2	10.3	14.5
	65~69	126	46.0	9.5	9.5	28.6	52.4	73.8	7.9	15.1
<b>Total</b>		<b>591</b>	<b>50.1</b>	<b>7.6</b>	<b>9.8</b>	<b>23.5</b>	<b>57.2</b>	<b>61.3</b>	<b>11.7</b>	<b>15.4</b>

Table 3-4-2-11 Frequency of physical exercise per week (%)

Gender	Age group (year)	Subjects (n)	Participants	At most once	1~2 times	3~4 times	5 times or more
M	60~64	109	94	14.8	27.7	27.7	29.8
	65~69	94	80	7.5	25.0	20.0	47.5
F	60~64	262	211	8.1	12.8	24.6	54.5
	65~69	126	116	4.3	11.2	15.5	69.0
<b>Total</b>		<b>591</b>	<b>501</b>	<b>8.4</b>	<b>17.2</b>	<b>22.3</b>	<b>52.1</b>

Table 3-4-2-12 Duration of each physical exercise (%)

Gender	Age group (year)	Participants	Less than 30 mins	30~60 mins	60 mins or more
M	60~64	94	33.0	44.7	22.3
	65~69	80	21.3	50.0	28.8
F	60~64	211	23.2	37.0	39.8
	65~69	116	16.4	31.0	52.6
<b>Total</b>		<b>501</b>	<b>23.2</b>	<b>39.1</b>	<b>37.7</b>

Table 3-4-2-13 Self-perception during physical exercise (%)

Gender	Age group (year)	Participants	Not much change in breathing and heart rate	Slight increase in breathing and heart rate with little perspiration	Rapid breathing, apparent increase in heart rate and perspiring greatly
M	60~64	94	38.3	48.9	12.8
	65~69	80	41.3	55.0	3.8
F	60~64	211	37.4	55.9	6.6
	65~69	116	44.8	51.7	3.4
<b>Total</b>		<b>501</b>	<b>39.9</b>	<b>53.5</b>	<b>6.6</b>

Table 3-4-2-14 Duration of persistent physical exercising (%)

Gender	Age group (year)	Participants	Less than 6 months	6~12 months	1~3 years	3~5 years	5 years or more
M	60~64	94	22.3	5.3	17.0	4.3	51.1
	65~69	80	11.3	6.3	23.8	11.3	47.5
F	60~64	211	12.3	7.6	22.3	11.8	46.0
	65~69	115	4.3	5.2	13.9	9.6	67.0
<b>Total</b>		<b>500</b>	<b>12.2</b>	<b>6.4</b>	<b>19.6</b>	<b>9.8</b>	<b>52</b>

Table 3-4-2-15 Purposes of physical exercise (%)

Gender	Age group (year)	Participants	Disease prevention and cure	Improvement in physical ability	Weight loss and fitness	Pressure relieve and mood regulation	Social-lizing	Others
M	60~64	94	73.4	45.7	18.1	42.6	12.8	12.8
	65~69	80	71.3	48.8	10.0	23.8	7.5	10.0
F	60~64	211	76.8	34.6	17.1	25.1	22.7	8.1
	65~69	116	87.1	39.7	11.2	22.4	26.7	9.5
<b>Total</b>		<b>501</b>	<b>77.6</b>	<b>40.1</b>	<b>14.8</b>	<b>27.5</b>	<b>19.4</b>	<b>9.6</b>

**Table 3-4-2-16** Major locations of physical exercise (%)

Major locations of physical exercise	M		F		Total
	60~64	65~69	60~64	65~69	
Participants	94	80	211	116	<b>501</b>
Stadium or arena	29.8	18.8	36.0	27.6	<b>30.1</b>
Park	59.6	81.3	66.8	69.8	<b>68.5</b>
Office or home	14.9	3.8	14.7	15.5	<b>13.2</b>
Open ground	34.0	23.8	13.3	22.4	<b>21.0</b>
Road or street	27.7	28.8	7.6	8.6	<b>15.0</b>
Club	7.4	2.5	5.7	6.0	<b>5.6</b>
Others	5.3	10.0	4.7	4.3	<b>5.6</b>

**Table 3-4-2-17** Major sports activities (%)

Major sports activities	M		F		Total
	60~64	65~69	60~64	65~69	
Participants	94	80	211	116	<b>501</b>
Jogging	22.3	15.0	8.6	1.7	<b>10.6</b>
Swimming	19.1	15.0	20.0	13.8	<b>17.6</b>
Walking	70.2	76.3	49.5	52.6	<b>58.4</b>
Ball games	11.7	7.5	4.8	7.8	<b>7.2</b>
Hiking	14.9	10.0	5.7	2.6	<b>7.4</b>
Cycling	8.5	0.0	2.4	0.9	<b>2.8</b>
Working out	12.8	16.3	8.6	4.3	<b>9.6</b>
Aerobics, yangko	7.4	12.5	32.9	39.7	<b>26.4</b>
Martial arts or qigong	16.0	11.3	40.0	46.6	<b>32.4</b>
Others	8.5	7.5	9.0	14.7	<b>10.0</b>

**Table 3-4-2-18 Major obstacles for participating in physical exercise (%)**

Major obstacles for participating in physical exercise	M		F		Total
	60~64	65~69	60~64	65~69	
Subjects (n)	89	81	200	92	<b>462</b>
Lack of interest	13.5	18.5	10.0	12.0	<b>12.6</b>
Laziness	40.4	33.3	34.0	23.9	<b>33.1</b>
Healthy, not necessary to exercise	6.7	0.0	1.0	1.1	<b>1.9</b>
Too weak	7.9	11.1	14.0	21.7	<b>13.9</b>
Work is too labour intensive, not necessary to exercise	4.5	3.7	4.0	1.1	<b>3.5</b>
Lack of time	39.3	14.8	42.0	31.5	<b>34.6</b>
Lack of locations and facilities	10.1	8.6	6.5	2.2	<b>6.7</b>
Lack of guidance	7.9	6.2	8.0	4.3	<b>6.9</b>
Lack of organization	7.9	4.9	6.5	4.3	<b>6.1</b>
Lack of money	6.7	0.0	0.0	0.0	<b>1.3</b>
Embarrassment	0.0	0.0	0.5	0.0	<b>0.2</b>
Others	15.7	27.2	20.5	25.0	<b>21.6</b>

**Table 3-4-2-19 Sports events frequently watched (%)**

Items	M		F		Total
	60~64	65~69	60~64	65~69	
Subjects (n)	87	81	145	66	<b>379</b>
Basketball	32.2	40.7	17.9	19.7	<b>26.4</b>
Volleyball	12.6	11.1	19.3	22.7	<b>16.6</b>
Football	59.8	54.3	15.2	25.8	<b>35.6</b>
Gymnastics	13.8	8.6	37.2	42.4	<b>26.6</b>
Swimming	17.2	23.5	38.6	40.9	<b>30.9</b>
Marital arts	14.9	4.9	19.3	15.2	<b>14.5</b>
Boxing	2.3	3.7	0.0	0.0	<b>1.3</b>
Table tennis	21.8	18.5	15.9	12.1	<b>17.2</b>
Billiards	10.3	0.0	0.0	0.0	<b>2.4</b>
Golf	0.0	1.2	0.0	0.0	<b>0.3</b>
Badminton	4.6	6.2	9.7	3.0	<b>6.6</b>
Baseball	0.0	1.2	0.0	0.0	<b>0.3</b>
Weight lifting	3.4	0.0	0.0	0.0	<b>0.8</b>
Fencing	0.0	0.0	0.7	0.0	<b>0.3</b>
Wrestling or judo	2.3	4.9	0.0	0.0	<b>1.6</b>
Others	19.5	21.0	30.3	15.2	<b>23.2</b>

**Table 3-4-2-20 Occurrence of diseases in the past five years (%)**

Gender	Age group(year)	Subjects (n)	Yes	No
M	60~64	109	58.7	41.3
	65~69	94	76.6	23.4
F	60~64	262	63.0	37.0
	65~69	126	72.2	27.8
<b>Total</b>		<b>591</b>	<b>66.3</b>	<b>33.7</b>

**Table 3-4-2-21 Diseases diagnosed in the past five years (%)**

Diseases	M		F		Total
	60~64	65~69	60~64	65~69	
Patients	64	72	165	91	<b>392</b>
Cancer	4.7	4.2	7.2	4.4	<b>5.6</b>
Cardiovascular diseases	9.4	25.0	13.3	13.2	<b>14.8</b>
Respiratory diseases	10.9	4.2	7.2	5.5	<b>6.9</b>
Accidental injury	1.6	5.6	3.0	4.4	<b>3.6</b>
Digestive system	14.1	9.7	13.3	14.3	<b>13.0</b>
Hypertension	54.7	51.4	58.4	69.2	<b>59.0</b>
Endocrine diseases	0.0	0.0	1.8	1.1	<b>1.0</b>
Urinary or reproductive	10.9	11.1	1.8	1.1	<b>4.8</b>
Diabetes	21.9	20.8	17.5	22.0	<b>19.8</b>
Others	17.2	22.2	28.3	30.8	<b>26.0</b>

**Table 3-4-2-22 Had heard of or had participated in the “Physical Fitness Study” (%)**

Gender	Age group (year)	Subjects (n)	Had heard of the Study	Had previously participated in the Study
M	60~64	108	65.7	33.0
	65~69	94	45.7	23.4
F	60~64	262	64.5	39.3
	65~69	126	59.5	40.5
<b>Total</b>		<b>590</b>	<b>60.6</b>	<b>35.9</b>

**Table 3-4-2-23 Understanding of the “Physical Fitness Study” (%)**

Gender	Age group (year)	Subjects (n)	Meaningless	To understand physical fitness status	To understand the importance of physical exercise	To increase scientific knowledge of physical fitness
M	60~64	109	4.6	93.6	57.8	43.1
	65~69	94	4.3	91.5	53.2	40.4
F	60~64	262	2.3	96.2	51.9	43.1
	65~69	126	3.2	92.9	50.0	43.7
<b>Total</b>		<b>591</b>	<b>3.2</b>	<b>94.2</b>	<b>52.8</b>	<b>42.8</b>

4.3. Anthropometric Measurements

Table 3-4-3-1 Height (cm)

Gender	Age group(year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	60~64	108	166.0	5.81	154.6	156.4	162.6	165.9	170.0	174.1	177.4
	65~69	94	164.7	5.51	155.8	157.0	160.3	164.8	167.7	172.4	176.3
F	60~64	261	153.8	5.53	143.5	145.1	150.6	153.9	157.3	160.5	165.5
	65~69	126	153.3	5.89	142.0	143.2	149.8	154.1	157.0	159.7	163.1

Table 3-4-3-2 Sitting height (cm)

Gender	Age group(year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	60~64	109	89.0	2.94	83.2	84.3	87.1	89.0	91.2	93.1	94.5
	65~69	94	88.4	2.94	83.2	84.6	86.1	88.5	90.4	92.1	94.2
F	60~64	260	83.0	3.14	77.1	78.2	81.0	83.3	85.0	87.0	88.4
	65~69	126	82.5	3.19	75.9	77.2	80.5	82.8	84.9	85.9	88.1

Table 3-4-3-3 Foot Length (cm)

Gender	Age group(year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	60~64	109	24.8	1.12	22.4	23.2	24.1	24.6	25.6	26.2	27.2
	65~69	94	24.7	0.89	22.7	23.1	24.1	24.8	25.2	25.6	26.5
F	60~64	261	22.3	1.01	20.5	20.6	21.6	22.3	22.8	23.5	24.4
	65~69	126	22.4	1.07	20.0	20.6	21.6	22.3	23.1	23.6	24.3

Table 3-4-3-4 Weight (kg)

Gender	Age group(year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	60~64	107	65.1	8.19	49.6	51.7	59.0	65.4	71.5	75.7	80.9
	65~69	94	66.1	9.07	48.2	49.7	58.9	66.4	72.6	78.7	81.7
F	60~64	262	55.2	9.16	41.8	43.2	48.6	53.6	61.0	67.3	75.2
	65~69	126	56.9	10.35	37.0	42.1	49.2	56.6	63.1	68.5	82.2

Table 3-4-3-5 BMI

Gender	Age group(year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	60~64	106	23.6	2.57	19.1	19.8	21.9	23.5	25.6	26.9	28.2
	65~69	94	24.3	2.89	18.2	20.2	22.6	24.4	26.5	28.1	29.5
F	60~64	261	23.4	3.65	17.8	18.8	20.8	23.0	25.7	28.2	32.0
	65~69	126	24.2	3.94	16.6	19.2	21.4	23.9	26.8	28.5	32.6



Table 3-4-3-6 Weight status according to height for weight standards (%)

Gender	Age group(year)	Subjects (n)	Underweight	Normal	Overweight	Obese
M	60~64	106	0.9	53.8	42.5	2.8
	65~69	94	4.3	38.3	47.9	9.6
	<b>Total</b>	<b>200</b>	<b>2.5</b>	<b>46.5</b>	<b>45.0</b>	<b>6.0</b>
F	60~64	261	7.7	52.1	29.5	10.7
	65~69	126	7.1	43.7	35.7	13.5
	<b>Total</b>	<b>387</b>	<b>7.5</b>	<b>49.4</b>	<b>31.5</b>	<b>11.6</b>

Table 3-4-3-7 Chest circumference (cm)

Gender	Age group(year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	60~64	108	91.6	6.19	80.2	80.4	88.3	91.9	95.3	99.0	104.2
	65~69	94	92.3	6.89	80.1	82.2	87.2	93.0	96.5	100.9	107.3
F	60~64	262	85.8	7.09	73.6	74.5	80.5	85.3	90.4	94.9	100.0
	65~69	126	86.8	7.17	73.5	75.5	81.3	88.1	91.9	95.6	99.4

Table 3-4-3-8 Waist circumference (cm)

Gender	Age group(year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	60~64	109	86.4	8.41	70.9	72.4	80.8	86.5	92.4	97.2	102.1
	65~69	94	89.3	9.35	70.9	72.5	84.3	89.3	96.9	102.1	103.8
F	60~64	261	81.3	9.91	65.0	66.2	73.8	80.8	87.6	93.9	102.0
	65~69	126	84.3	9.82	63.2	66.3	77.9	84.7	89.4	97.9	103.3

Table 3-4-3-9 Hip circumference (cm)

Gender	Age group(year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	60~64	109	93.0	4.48	85.3	86.4	89.3	92.7	96.5	98.7	101.9
	65~69	94	94.6	5.98	82.9	83.4	90.2	94.5	99.6	102.3	103.7
F	60~64	262	90.9	6.76	81.0	81.6	86.0	89.8	95.0	100.2	106.8
	65~69	126	91.8	7.71	78.0	80.8	86.9	91.4	95.2	101.5	111.8

Table 3-4-3-10 Waist-Hip Ratio (WHR)

Gender	Age group(year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	60~64	109	0.929	0.0670	0.810	0.833	0.884	0.929	0.969	1.013	1.061
	65~69	94	0.943	0.0597	0.827	0.860	0.897	0.947	0.980	1.016	1.060
F	60~64	261	0.893	0.0696	0.769	0.800	0.841	0.896	0.939	0.986	1.026
	65~69	126	0.918	0.0683	0.785	0.825	0.877	0.916	0.958	1.002	1.069

**Table 3-4-3-11 Shoulder width (cm)**

Gender	Age group(year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	60~64	109	36.7	1.89	32.9	33.5	35.6	36.8	37.9	39.2	40.0
	65~69	94	36.8	1.88	33.0	33.4	35.8	36.6	38.1	39.4	39.8
F	60~64	262	34.5	1.59	31.4	31.9	33.5	34.6	35.5	36.4	37.4
	65~69	126	34.7	1.77	31.0	31.4	33.8	34.5	35.8	36.7	37.8

**Table 3-4-3-12 Pelvis width (cm)**

Gender	Age group(year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	60~64	109	27.2	1.67	24.6	24.8	26.0	27.0	28.5	29.6	30.5
	65~69	94	27.6	1.65	25.1	25.3	26.6	27.5	28.7	29.2	30.2
F	60~64	262	28.5	1.88	25.5	25.9	27.3	28.4	29.6	30.8	31.9
	65~69	126	28.9	2.28	24.8	25.1	27.4	29.1	30.0	31.8	33.1

**Table 3-4-3-13 Upper arm skinfold thickness (mm)**

Gender	Age group(year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	60~64	106	9.4	4.78	2.0	2.7	6.0	8.5	13.0	16.0	19.8
	65~69	94	11.1	5.21	2.9	3.0	6.9	11.0	14.0	17.3	23.5
F	60~64	261	21.0	6.62	9.0	10.0	16.3	21.0	25.5	29.0	34.6
	65~69	125	22.1	7.39	10.0	10.2	17.0	21.0	26.8	31.0	37.2

**Table 3-4-3-14 Subscapular skinfold thickness (mm)**

Gender	Age group(year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	60~64	109	17.1	6.86	5.0	6.0	12.0	17.0	22.0	26.0	29.7
	65~69	94	18.5	6.96	5.9	7.4	13.5	19.0	22.1	28.5	31.6
F	60~64	262	19.2	7.40	6.0	8.0	14.0	18.8	24.0	29.0	33.1
	65~69	126	20.7	7.62	4.0	7.2	16.4	21.0	26.0	29.8	35.4

**Table 3-4-3-15 Abdominal skinfold thickness (mm)**

Gender	Age group(year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	60~64	109	22.2	8.49	7.0	7.8	15.3	23.0	28.0	34.0	35.9
	65~69	93	22.4	8.65	7.8	8.7	14.3	24.5	29.0	32.3	36.5
F	60~64	261	25.8	7.80	6.8	14.6	21.0	26.0	30.3	35.5	40.1
	65~69	126	28.1	8.02	11.7	15.5	23.9	28.0	33.1	37.5	45.2

**Table 3-4-3-16 Percentage body fat (%)**

Gender	Age group(year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	60~64	106	16.9	5.02	8.3	10.6	12.9	16.6	20.4	23.8	26.1
	65~69	94	18.2	5.25	9.1	10.8	14.4	18.4	21.5	25.4	27.7
F	60~64	260	27.0	7.10	14.7	18.4	21.7	26.7	31.6	35.9	41.3
	65~69	125	28.5	7.70	14.8	18.3	23.3	27.8	34.0	37.4	45.4

Table 3-4-3-17 Lean body mass (kg)

Gender	Age group(year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	60~64	104	54.1	5.74	42.8	46.7	50.0	53.2	58.6	61.9	64.4
	65~69	94	53.8	6.10	39.5	46.6	49.4	53.7	58.6	61.7	64.2
F	60~64	260	39.9	4.58	32.5	33.8	37.1	40.0	42.8	45.2	49.3
	65~69	125	40.2	4.59	30.8	34.8	37.4	40.1	42.8	46.5	50.5

4.4. Physiological Function

Table 3-4-4-1 Resting pulse (times/min)

Gender	Age group(year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	60~64	109	74.7	9.42	58.0	59.0	69.0	74.0	81.0	86.0	96.8
	65~69	94	74.4	5.81	59.7	63.5	72.0	74.0	78.0	80.0	86.0
F	60~64	262	73.2	7.07	60.0	62.0	68.0	72.5	78.0	80.0	86.0
	65~69	126	73.9	8.27	58.0	60.0	68.0	74.0	78.0	84.0	92.4

Table 3-4-4-2 Systolic pressure (mmHg)

Gender	Age group(year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	60~64	109	131.8	13.05	110.0	110.0	122.0	132.0	140.0	146.0	166.4
	65~69	94	133.4	15.99	108.5	110.0	124.0	132.0	140.5	152.0	172.3
F	60~64	261	127.8	13.36	103.4	106.0	118.0	128.0	136.0	146.0	154.0
	65~69	126	132.8	16.33	103.2	108.0	122.0	131.0	140.0	150.6	164.8

Table 3-4-4-3 Diastolic pressure (mmHg)

Gender	Age group(year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	60~64	109	80.1	8.71	62.6	66.5	74.0	80.0	88.0	90.0	96.0
	65~69	94	77.6	9.34	60.0	60.0	70.0	80.0	86.0	90.0	92.6
F	60~64	261	76.9	8.54	60.0	62.2	70.0	76.0	81.0	90.0	92.3
	65~69	126	77.9	9.68	60.0	64.0	70.0	80.0	82.0	90.0	96.8

Table 3-4-4-4 Pressure difference (mmHg)

Gender	Age group(year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	60~64	109	51.6	11.70	32.9	38.0	42.0	52.0	60.0	68.0	75.4
	65~69	94	55.9	12.99	31.7	40.0	46.0	54.0	64.0	72.0	88.3
F	60~64	261	50.9	10.96	32.0	38.0	43.0	50.0	58.0	66.0	74.0
	65~69	126	54.8	12.55	35.6	41.4	46.0	52.5	60.0	72.0	83.1

Table 3-4-4-5 Vital capacity (ml)

Gender	Age group(year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	60~64	108	2998.2	835.33	1451.2	1629.2	2426.8	2971.5	3501.3	4001.5	4622.7
	65~69	94	2671.4	648.39	1424.3	1564.0	2228.0	2716.5	3064.5	3500.0	4020.5
F	60~64	259	1896.2	574.89	1021.4	1088.0	1440.0	1851.0	2276.0	2577.0	3151.0
	65~69	124	1817.4	542.60	773.5	934.8	1409.3	1820.0	2180.5	2477.0	2865.3

Table 3-4-4-6 Vital capacity/weight (ml/kg)

Gender	Age group(year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	60~64	205	46.5	12.01	22.7	30.5	38.9	45.9	54.4	60.4	67.8
	65~69	192	41.1	10.94	22.8	27.3	32.8	40.3	48.1	56.9	63.1
F	60~64	413	35.1	10.96	15.9	21.9	27.0	34.5	41.9	49.3	60.3
	65~69	256	32.7	9.69	16.8	20.3	26.5	31.3	38.9	44.6	53.0

4.5. Physical Fitness

Table 3-4-5-1 Grip strength (kg)

Gender	Age group(year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	60~64	108	36.1	7.07	21.4	23.6	33.0	36.9	40.5	44.3	48.4
	65~69	94	34.7	7.37	21.0	22.9	29.8	34.0	40.3	45.6	48.3
F	60~64	256	20.2	4.67	11.6	12.4	16.7	20.1	23.5	26.5	30.0
	65~69	116	20.5	4.67	13.0	13.6	17.1	20.1	23.4	27.1	30.2

Table 3-4-5-2 Sit and reach (cm)

Gender	Age group(year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	60~64	107	-0.9	8.60	-17.9	-14.8	-7.1	-0.7	5.4	10.2	14.7
	65~69	89	-2.3	8.18	-16.8	-15.3	-8.6	-3.1	2.8	7.6	16.8
F	60~64	261	6.3	9.04	-12.9	-9.6	0.3	6.6	12.6	18.2	23.4
	65~69	121	7.5	8.49	-8.9	-7.3	1.2	7.5	13.4	19.4	23.0

Table 3-4-5-3 Respond time (sec)

Gender	Age group(year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	60~64	108	0.48	0.098	0.36	0.36	0.43	0.47	0.51	0.57	0.77
	65~69	94	0.51	0.115	0.38	0.39	0.45	0.49	0.54	0.67	0.85
F	60~64	262	0.55	0.122	0.40	0.42	0.47	0.52	0.59	0.69	0.87
	65~69	126	0.63	0.252	0.40	0.42	0.50	0.56	0.68	0.89	1.17

Table 3-4-5-4 One foot stands with eyes closed (sec)

Gender	Age group(year)	n	Mean	SD	P <sub>3</sub>	P <sub>10</sub>	P <sub>25</sub>	P <sub>50</sub>	P <sub>75</sub>	P <sub>90</sub>	P <sub>97</sub>
M	60~64	107	14.4	18.52	3.0	3.0	5.0	8.0	14.0	29.2	87.8
	65~69	93	9.7	15.17	2.0	3.0	4.0	6.0	11.0	18.0	29.4
F	60~64	261	10.2	13.10	2.0	2.0	4.0	7.0	12.0	19.8	43.1
	65~69	124	7.4	6.12	1.0	2.0	4.0	5.0	9.0	16.0	21.3



# PART IV

## Appendix

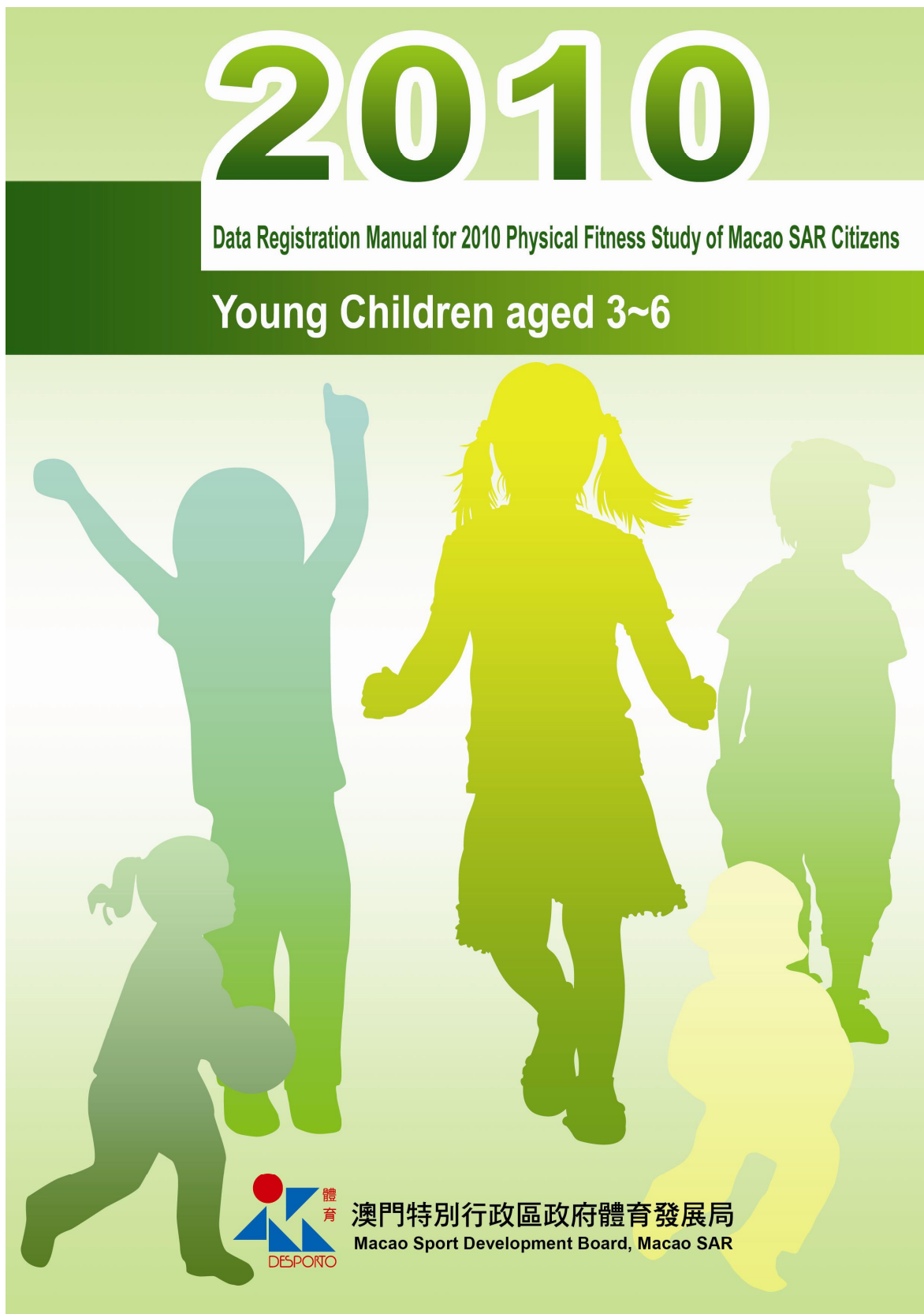
human genome project

```
0101 011 0101 0101 1100 01 01010 11 01 100 101 0110 01 01 1011 01 0101
1 10 1 11 01 1 11 111 01010101 01 0101 10
10 0 101 010 1 10 1 10 101010101 1010 1110110101
11 0 10 10 10101 1010 10101
1 01101010 1010
10 01 01010
1 0 10 01
1010 1011 0
101010 101 0
11 0101 10
110 1 010
100 110111011 1010
1010 105 010 00100 0 010 101 101
100 1 10 100011 101 0 101
011010 010101 010 010
010 1 01 10 1 1 01 0
11 01 1 010 1 1 1 10 01010 1 01 110011 101001010110101
110 10 10100 11010 1 010 0 1101 101 210
1 111010010010101 0100101 1010 0101010 1010
```



## Appendix 1: Data Registration Manual of 2010 Physical Fitness Study of Macao SAR Citizens

### I. Young Children





Thank you for participating in our Physical Fitness Study! This study is organized by the Macao SAR Government to promote sports for all. Please be honest and serious when filling the questionnaire and undergoing the physical examination. We promise to keep your personal information confidential and that we will not publish or use it on its own. It will only be used as part of the whole study for analyzing. Thank you for your sincere participation.

For any questions on the questionnaire or testing, please contact Sports Medicine Center, Macao Sport Development Board!

Telephone: 2881 0896, 8893 4566, 8893 4540

<b>Name:</b>	_____
<b>Gender:</b>	_____
<b>Age:</b>	_____ (years)
<b>Kindergarten:</b>	_____
<b>Telephone Number:</b>	_____
<b>Address:</b>	_____ _____





**Methods for filling in questionnaire:**

Please fill in the blanks with the corresponding numbers. For example, if you select Choice 1, please fill in the blank with “1”. If the number happens to be two-digits, please put both digits in the same blank. For instance, if you select Choice 11, fill in the blank with **11**. For multiple choice questions, if you only select one or two choice(s), please write down **0** for the rest of the blank(s).

**I. General Information (to be filled by parents of young children)**

1. Macao ID card number																			
2. Gender		(1) M			(2) F														
3. Date of birth								Y				M							D
4. Examination date <i>(to be filled by examiner)</i>								Y				M							D
5. Kindergarten code number <i>(to be filled by examiner)</i>																			
6. Serial number <i>(to be filled by examiner)</i>																			
7. Years of residence in Macao <i>(refers to years of continuous residence in Macao.</i>																			
<i>If the child left Macao over 1 year, the years of residence in Macao shall be recalculated from the time of returning to Macao.)</i>																			

**II. Questionnaire (to be filled by parents of young children)**

**(I) Personal Information of Young Child**

1. Birth place																			
(1) Mainland		(2) Macao			(3) Hong Kong			(4) Portugal			(5) Others								
2. Community of residence																			
(1) S. Francisco <i>(Coloane)</i>																			
(2) Na. Sra. do Carmo <i>(Taipa)</i>																			
(3) Paróquia de S. Lourenço <i>(Zonas das Colinas da Barra e da Penha, da Praia do Manduco e do Porto Interior)</i>																			
(4) Paróquia da Sé Catedral <i>(Zonas da Almeida Ribeiro, da Praia Grande, da Rua do Campo, dos Lotes norte e sul do Porto Exterior e da Zona do Lago Nam Van)</i>																			
(5) Paróquia de Santo António <i>(Zonas da Freguesia de Santo António, do Oeste de Macau, incluindo Av. Horta e Costa, de San Kiu e do Patane)</i>																			
(6) Paróquia de S. Lázaro <i>(Zona do Conselheiro Ferreira de Almeida e da Colina da Guia)</i>																			
(7) Paróquia de Nossa Senhora de Fátima <i>(Zonas do Norte, incluindo Ilha Verde, Tamagnini Barbosa, Areia Preta, Fái Chi Kei e Reservatório)</i>																			
3. Birth weight (kg) <i>(If not sure, please fill in 99.9)</i>													.						
4. Birth length (cm) <i>(If not sure, please fill in 99.9)</i>													.						
5. Gestational age																			
(1) Premature <i>(birth at least two weeks before term)</i>																			
(2) Term <i>(birth within two weeks of expectancy date)</i>																			
(3) Post-term <i>(birth at least two weeks after term)</i>																			



6. Types of feeding within four months after birth				
(1) Breast feeding	(2) Formula feeding	(3) Mixed feeding		
7. Number of siblings ( <i>Excluding the young child himself or herself. If none, please write 0</i> )				
8. Birth order among siblings ( <i>If none, please write 0</i> )				
9. Frequency of flu or fever within the past year				
(1) Never	(2) 1~2 times	(3) 3~5 times	(4) 6 times or more	
10. Disease diagnosed by doctors ( <i>If negative, skip to question 12</i> )				
(1) Yes	(2) No			
11. Diseases experienced ( <i>in order of precedence, at most three diseases</i> ):				
(1) Chronic Bronchitis	(2) Pneumonia	(3) Tuberculosis		
(4) Asthma	(5) Hematic Disease	(6) Heart disease		
(7) Hypertension	(8) Anemia	(9) Nephritis		
(10) Hepatitis	(11) Hyperthyroidism	(12) Hypothyroidism		
(13) Rhachitis	(14) Epilepsia			
(15) Accidental injury ( <i>damages to the human body that need treatments, or damages that affect normal activities</i> )				
(16) Others				

Please answer the following questions according to the subject's status in the past half year.

12. Average sleeping hours per day ( <i>including naps</i> )				
(1) Below 8 hours	(2) 8~10 hours	(3) 10 hours or more		
13. Kindergarten attendance				
(1) Never	(2) Half day	(3) Full day	(4) Boarding	
14. Guardian at home				
(1) Parents	(2) Senior family members	(3) babysitter( <i>worker</i> )	(4) Others	
15. Hobby classes during spare time ( <i>in order of precedence, at most three items</i> )				
(1) None	(2) Physical exercise	(3) Tutoring	(4) Chess-related	
(5) Music and dancing	(6) Drawing and calligraphy	(7) Others		
16. Time spent on outdoor activities per day ( <i>including activities in and out of kindergarten</i> )				
(1) Less than 30 mins	(2) 30 mins~1hr	(3) 1~2 hrs	(4) 2 hrs or more	
17. Time spent on watching TV, video and playing video games per day				
(1) Less than 30 mins	(2) 30 mins~1hr	(3) 1~2 hrs		
(4) 2~3 hrs	(5) 3 hrs or more			
18. Types of sports frequently participated ( <i>in order of precedence, at most three items</i> )				
(1) Swimming	(2) Track & field	(3) Ball games	(4) Gymnastics	
(5) Skating	(6) Dancing	(7) Rope Skipping	(8) Martial arts, Taekwondo	
(9) Cycling	(10) Judo	(11) Karate	(12) Yoga	(13) Others



**(II) Paternal Personal Information**

1. Date of birth					Y			M			D
2. Birth place											
(1) Mainland		(2) Macao		(3) Hong Kong		(4) Portugal		(5) Others			
3. Years of residence in Macao ( <i>refers to years of continuous residence in Macao.</i> )											
<i>If the time of leaving Macao was over 1 year, the years of residence in Macao shall be recalculated from the time of returning to Macao.)</i>											
4. Height (cm)											
5. Weight (kg)											
6. Education level											
(1) Below primary school education level				(2) Primary school			(3) Secondary school				
(4) University or professional college				(5) Master			(6) Doctoral				
7. Current occupation											
(1) Legislative officer, high rank officer of public administration, head of organization or manager											
(2) Professional ( <i>professionals in various disciplines including higher education and secondary school teaching staff</i> )											
(3) Technician or professional assistant ( <i>persons who engaged in technical works in various disciplines including preschool, primary school and special education teachers</i> )											
(4) Office clerk ( <i>secretaries, secretarial work office clerks, cashiers, receptionists, ticket agents and workers of similar nature</i> )											
(5) Customer service or sales ( <i>persons who engaged in tourism, gambling, entertainment, catering, beauty treatment, insurance and so on, and also including firemen, traffic and public security policemen, security staff, sales personnel etc.</i> )											
(6) Workers in the fishery or agricultural field ( <i>fishermen, farmers, and persons who engaged in storing and selling of fishery, agricultural, and livestock products etc.</i> )											
(7) Artisan or craftsman( <i>including building workers and handicraft workers</i> )											
(8) Machine operator, driver or assembler											
(9) Non-technician( <i>ex. cleaners, property management officers, postmen, porters</i> )											
(10) Others			(11) Unemployed				(12) Household duties				
8. Frequency of sports activities per week ( <i>If select (1), skip questions 9 &amp; 10</i> )											
(1) Never		(2) At most once		(3) 1~2 times		(4) 3~4 times		(5) At least 5 times			
9. Types of sports frequently participated ( <i>in order of precedence, at most three items</i> )											
(1) Jogging			(2) Swimming			(3) Walking					
(4) Ball games			(5) Climbing			(6) Cycling					
(7) Working out			(8) Aerobics, yangko			(9) Martial arts or qigong					
(10) Boxing			(11) Fencing			(12) Yoga					
(13) Judo			(14) Taekwondo			(15) Karate		(16) Others			
10. Average duration of sports activities per time											
(1) Less than 30 mins			(2) 30~60 mins			(3) At least 60 mins					



**(III) Maternal Personal Information**

1. Date of birth						Y				M				D	
2. Birth place															
(1) Mainland		(2) Macao		(3) Hong Kong		(4) Portugal		(5) Others							
3. Years of residence in Macao ( <i>refers to years of continuous residence in Macao.</i> )															
<i>If the time of leaving Macao was over 1 year, the years of residence in Macao shall be recalculated from the time of returning to Macao.</i>															
4. Height (cm)															
5. Weight (kg)															
6. Education level															
(1) Below primary school education level				(2) Primary school				(3) Secondary school							
(4) University or professional college				(5) Master				(6) Doctoral							
7. Current occupation															
(1) Legislative officer, high rank officer of public administration, head of organization or manager															
(2) Professional ( <i>professionals in various discipline, including higher education and secondary school teaching staff</i> )															
(3) Technician or professional assistant ( <i>persons who engaged in technical works in various disciplines, including preschool, primary school and special education teachers</i> )															
(4) Office clerk ( <i>secretaries, secretarial work office clerks, cashiers, receptionists, ticket agents and workers of similar nature</i> )															
(5) Customer service or sales ( <i>persons who engaged in tourism, gambling, entertainment, catering, beauty treatment, insurance and so on, and also including firemen, traffic and public security policemen, security staff, sales personnel etc.</i> )															
(6) Workers in the fishery or agricultural field ( <i>fishermen, farmers, and persons who engaged in storing and selling of fishery, agricultural, and livestock products etc.</i> )															
(7) Artisan or craftsman ( <i>including building workers and handicraft workers</i> )															
(8) Machine operator, driver or assembler															
(9) Non-technician ( <i>ex. cleaners, property management officers, postmen, porters</i> )															
(10) Others				(11) Unemployed				(12) Household duties							
8. Frequency of sports activities per week ( <i>If select (1), skip questions 9 &amp; 10</i> )															
(1) Never		(2) At most once		(3) 1~2 times		(4) 3~4 times		(5) At least 5 times							
9. Types of sports often participated ( <i>in order of precedence, at most three items</i> )															
(1) Jogging				(2) Swimming				(3) Walking							
(4) Ball games				(5) Climbing				(6) Cycling							
(7) Working out				(8) Aerobics, yangko				(9) Martial arts or qigong							
(10) Boxing				(11) Fencing				(12) Yoga							
(13) Judo				(14) Taekwondo				(15) Karate		(16) Others					
10. Average duration of sports activities per time															
(1) Less than 30 mins				(2) 30~60 mins				(3) At least 60 mins							






## II. Children and Adolescents (Students)

**2010**

Data Registration Manual for 2010 Physical Fitness Study of Macao SAR Citizens

Children and adolescents (Students aged 6~22)

 體育  
澳門特別行政區政府體育發展局  
DESPORTO Macao Sport Development Board, Macao SAR



**Thank you for participating in our Physical Fitness Study! This study is organized by the Macao SAR Government to promote sports for all. Please be honest and serious when filling the questionnaire and undergoing the physical examination. We promise to keep your personal information confidential and that we will not publish or use it on its own. It will only be used as part of the whole study for analyzing. Thank you for your sincere participation.**

**For any questions on the questionnaire or testing, please contact Sports Medicine Center, Macao Sport Development Board!**

**Telephone: 2881 0896, 8893 4566, 8893 4540**

<b>Name:</b>	_____
<b>Gender:</b>	_____
<b>Age:</b>	_____ <b>(years)</b>
<b>School/University:</b>	_____
<b>Telephone Number:</b>	_____
<b>Address:</b>	_____ _____



**Methods for filling in questionnaire:**

Please fill in the blanks with the corresponding numbers. For example, if you select Choice 1, please fill in the blank with "1". If the number happens to be two-digits, please put both digits in the same blank. For instance, if you select Choice 11, fill in the blank with **11**. For multiple choice questions, if you only select one or two choice(s), please write down **0** for the rest of the blank(s).

**I. General Information (primary student's personal information can be filled by the parents)**

1. Macao ID card number														
2. Gender		(1) M	(2) F											
3. Date of birth								Y			M			D
4. Examination date <i>(to be filled by examiner)</i>								Y			M			D
5. School/University code number <i>(to be filled by examiner)</i>														
6. Serial number <i>(to be filled by examiner)</i>														
7. Years of residence in Macao <i>(refers to years of continuous residence in Macao. If the time of leaving Macao was over 1 year, the years of residence in Macao shall be recalculated from the time of returning to Macao.)</i>														

**II. Questionnaire (primary student's personal information can be filled by the parents)**

1. Birth place					
(1) Mainland	(2) Macao	(3) Hong Kong	(4) Portugal	(5) Others	
2. Community of residence					
(1) S. Francisco <i>(Coloane)</i>					
(2) Na. Sra. do Carmo <i>(Taipa)</i>					
(3) Paróquia de S. Lourenço <i>(Zonas das Colinas da Barra e da Penha, da Praia do Manduco e do Porto Interior)</i>					
(4) Paróquia da Sé Catedral <i>(Zonas da Almeida Ribeiro, da Praia Grande, da Rua do Campo, dos Lotes norte e sul do Porto Exterior e da Zona do Lago Nam Van)</i>					
(5) Paróquia de Santo António <i>(Zonas da Freguesia de Santo António, do Oeste de Macau, incluindo Av. Horta e Costa, de San Kiu e do Patane)</i>					
(6) Paróquia de S. Lázaro <i>(Zona do Conselheiro Ferreira de Almeida e da Colina da Guia)</i>					
(7) Paróquia de Nossa Senhora de Fátima <i>(Zonas do Norte, incluindo Ilha Verde, Tamagnini Barbosa, Areia Preta, Fái Chi Kei e Reservatório)</i>					
3. Disease diagnosed by doctors within the past 5 years <i>(If the answer is negative, skip to question 5.)</i>					
(1) Yes	(2) No				





4. Diseases experienced ( <i>in order of precedence, at most three diseases</i> ):					
(1) Chronic Bronchitis	(2) Pneumonia	(3) Tuberculosis			
(4) Asthma	(5) Hematic Disease	(6) Heart disease			
(7) Hypertension	(8) Anemia	(9) Nephritis			
(10) Hepatitis	(11) Hyperthyroidism	(12) Hypothyroidism			
(13) Rhachitis	(14) Epilepsia				
(15) Accidental injury ( <i>damages to the human body that need treatments, or damages that affect normal activities</i> )					
(16) Others					
5. Number of siblings ( <i>Excluding yourself, if none, please write 0</i> )					
6. Birth order among siblings ( <i>if none, please write 0</i> )					

-----  
Please answer the following questions according to the subject's status in the past half year

7. School attendance					
(1) Never	(2) Half day	(3) Full day	(4) Boarding		
8. Transportation means to school					
(1) Walking	(2) Motorcycle	(3) Public transportation	(4) Private car		
9. Total time spent commuting to and from school per day					
(1) Within 30 mins	(2) 30 mins~1hr	(3) 1~2 hrs	(4) 2 hrs or more		
10. Frequency of physical exercise (PE) class per week ( <i>two continuous classes shall only be counted as once, if choose (5), skip to question 13</i> )					
(1) 1time	(2) 2 times	(3) 3 times	(4) 4 times or more	(5) Never	
11. Number of session(s) used in physical exercise (PE) class each time					
(1) 1 session	(2) 2 sessions	(3) more than 2 sessions			
12. Self-perception during PE class					
(1) Breathing and heart rate remained almost the same					
(2) Slight increase in breathing and heart rate, perspired slightly					
(3) Rapid breathing and increased heart rate, perspired greatly					
13. Time spent on outdoor activities during leisure time per day					
(1) Less than 30 mins	(2) 30 mins~1hr	(3) 1~2 hrs	(4) 2 hrs or more		
14. Time spent on watching TV, video and playing video games per day					
(1) Less than 30 mins	(2) 30 mins~1hr	(3) 1~2 hrs			
(4) 2~3 hrs	(5) 3 hrs or more				
15. Hobby classes during leisure time ( <i>in order of precedence, at most three items</i> )					
(1) None	(2) Physical exercise	(3) Tutoring	(4) Chess-related		
(5) Music and dancing	(6) Drawing and calligraphy	(7) Others			



16. Frequency of extracurricular sports activities per week (If choose choice (1), skip to question No.21)			
(1) Never	(2) At most once	(3) 1~2 times	
(4) 3~4 times	(5) At least 5 times		
17.Types of sports frequently participated			
(in order of precedence, at most three items)(If choose choice (3), question 18 must be answered, otherwise skip question 18)			
(1) Swimming	(2) Track & field	(3) Ball games	(4) Gymnastics
(5) Skating	(6) Dancing	(7) Rope Skipping	(8) Martial arts, Taekwondo
(9) Cycling	(10) Judo	(11) Karate	(12) Yoga
(13) Others			
18. Ball games frequently participated			
(1) Basketball	(2) Volleyball	(3) Football	(4) Table tennis
(5) Badminton	(6) Tennis	(7) Golf	(8) Billiards (9) Others
19. Average duration of physical exercise per time			
(1) Within 30 mins	(2) 30 mins~1hr		
(3) 1~2 hrs	(4) 2 hrs or more		
20. Self-perception after physical exercise			
(1) Breathing and heart rate remained almost the same			
(2) Slight increase in breathing and heart rate, perspired slightly			
(3) Rapid breathing and increased heart rate, perspired greatly			
21. Cumulative time spent on homework and lesson revision each day			
(1) Within 30 mins	(2) 30 mins~1hr	(3) 1~2 hrs	
(4) 2~3 hrs	(5) 3 hrs or more		
22. Average cumulative sleeping hours per day (including naps)			
(1) Below 8 hours	(2) 8~10 hours	(3) 10 hours or more	



**III. Testing indexes (to be filled by examiner at location)**

1. Height (cm)	<input type="text"/>	<input type="text"/>	<input type="text"/>	.	<input type="text"/>														
2. Sitting height (cm)	<input type="text"/>	<input type="text"/>	<input type="text"/>	.	<input type="text"/>														
3. Weight (kg)	<input type="text"/>	<input type="text"/>	<input type="text"/>	.	<input type="text"/>														
4. Chest circumference (cm)	<input type="text"/>	<input type="text"/>	<input type="text"/>	.	<input type="text"/>														
5. Waist circumference (cm)	<input type="text"/>	<input type="text"/>	<input type="text"/>	.	<input type="text"/>														
6. Hip circumference (cm)	<input type="text"/>	<input type="text"/>	<input type="text"/>	.	<input type="text"/>														
7. Upper arm skinfold thickness (mm)	<input type="text"/>	<input type="text"/>	<input type="text"/>	.	<input type="text"/>														
8. Subscapular skinfold thickness (mm)	<input type="text"/>	<input type="text"/>	<input type="text"/>	.	<input type="text"/>														
9. Abdominal skinfold thickness (mm)	<input type="text"/>	<input type="text"/>	<input type="text"/>	.	<input type="text"/>														
10. Shoulder width (cm)	<input type="text"/>	<input type="text"/>	<input type="text"/>	.	<input type="text"/>														
11. Pelvis width (cm)	<input type="text"/>	<input type="text"/>	<input type="text"/>	.	<input type="text"/>														
12. Foot length (cm)	<input type="text"/>	<input type="text"/>	<input type="text"/>	.	<input type="text"/>														
13. Resting pulse (times/minute)	<input type="text"/>	<input type="text"/>	<input type="text"/>																
14. Systolic pressure (mmHg)	<input type="text"/>	<input type="text"/>	<input type="text"/>																
15. Diastolic pressure (mmHg)	<input type="text"/>	<input type="text"/>	<input type="text"/>																
16. Vital capacity (ml)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>														
17. Pull-ups with body inclined (times) (6~12 years M) / Pull-ups (times) (13~22 years M) / One-minute sit-ups (times) (6~22 years F)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>														
18. Standing long jump (cm)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>														
19. 50 m run (sec)	<input type="text"/>	<input type="text"/>	<input type="text"/>	.	<input type="text"/>														
20. 50 x 8 shuttle run (sec) (6~12 years) / 800 m run (sec) (13~22 years F) / 1000 m run (sec) (13~22 years M)	<input type="text"/>	<input type="text"/>	<input type="text"/>	.	<input type="text"/>														
21. Grip strength (kg)	<input type="text"/>	<input type="text"/>	<input type="text"/>	.	<input type="text"/>														
22. Vertical jump (cm)	<input type="text"/>	<input type="text"/>	<input type="text"/>	.	<input type="text"/>														
23. Back strength (kg)	<input type="text"/>	<input type="text"/>	<input type="text"/>																
24. Sit and reach (cm)	<input type="text"/>	<input type="text"/>	<input type="text"/>	.	<input type="text"/>														
25. One foot stands with eyes closed (OFSEC) (sec)	<input type="text"/>	<input type="text"/>	<input type="text"/>																
26. Selective respond time (sec)	<input type="text"/>		.	<input type="text"/>	<input type="text"/>														
27. Dental decay (6~18 years)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
	d	<input type="text"/>	D	<input type="text"/>	m	<input type="text"/>	M	<input type="text"/>	f	<input type="text"/>	F	<input type="text"/>							



28. Vision			
Naked eyes: left		right	
String mirror correction: left		positive	_____
		negative	_____
String mirror correction: right		positive	_____
		negative	_____
Refractive errors: left		Refractive errors: right	
(0) Normal	(1) Near sighted	(2) Far sighted	(3) Others
29. Color vision deficiency exam:			
(1) Normal	(2) Abnormal		

**Examiner:** \_\_\_\_\_




### III. Adults (aged 20~39)

2010

Data Registration Manual for 2010 Physical Fitness Study of Macao SAR Citizens

Adults aged 20~39

 體育  
澳門特別行政區政府體育發展局  
Macao Sport Development Board, Macao SAR



Thank you for participating in our Physical Fitness Study! This study is organized by the Macao SAR Government to promote sports for all. Please be honest and serious when filling the questionnaire and undergoing the physical examination. We promise to keep your personal information confidential and that we will not publish or use it on its own. It will only be used as part of the whole study for analyzing. Thank you for your sincere participation.

For any questions on the questionnaire or testing, please contact Sports Medicine Center, Macau Sport Development Board!

Telephone: 2881 0896, 8893 4566, 8893 4540

<b>Name:</b>	_____
<b>Gender:</b>	_____
<b>Age:</b>	_____ (years)
<b>Working Unit:</b>	_____
<b>Telephone Number:</b>	_____
<b>Address:</b>	_____ _____



**Methods for filling in questionnaire:**

Please fill in the blanks with the corresponding numbers. For example, if you select Choice 1, please fill in the blank with "1". If the number happens to be two-digits, please put both digits in the same blank. For instance, if you select Choice 11, fill in the blank with **11**. For multiple choice questions, if you only select one or two choice(s), please write down 0 for the rest of the blank(s).

**I. General Information**

1. Macao ID card number											
2. Gender	(1)M	(2)F									
3. Date of birth					Y			M			D
4. Examination date					Y			M			D
5. Working unit code number (to be filled by examiner)											
6. Serial number (to be filled by examiner)											
7. Years of residence in Macao (refers to years of continuous residence in Macao. If the time of leaving Macao was over 1 year, the years of residence in Macao shall be recalculated from the time of returning to Macao.)											
8. Category of occupation											
(1) labour intensive work (persons engaged in light or heavy labour, and mainly standing when working)											
(2) non-labour intensive work (persons engaged in intellectual work, and mainly sitting when working)											

**II. Questionnaire**

1. Birth place	
(1) Mainland	(2) Macao
(3) Hong Kong	(4) Portugal
(5) Others	
2. Community of residence	
(1) S. Francisco (Coloane)	
(2) Na. Sra. do Carmo (Taipa)	
(3) Paróquia de S. Lourenço (Zonas das Colinas da Barra e da Penha, da Praia do Manduco e do Porto Interior)	
(4) Paróquia da Sé Catedral (Zonas da Almeida Ribeiro, da Praia Grande, da Rua do Campo, dos Lotes norte e sul do Porto Exterior e da Zona do Lago Nam Van)	
(5) Paróquia de Santo António (Zonas da Freguesia de Santo António, do Oeste de Macau, incluindo Av. Horta e Costa, de San Kiu e do Patane)	
(6) Paróquia de S. Lázaro (Zona do Conselheiro Ferreira de Almeida e da Colina da Guia)	
(7) Paróquia de Nossa Senhora de Fátima (Zonas do Norte, incluindo Ilha Verde, Tamagnini Barbosa, Areia Preta, Fái Chi Kei e Reservatório)	



3. Education level			
(1) Below primary school education level	(2) Primary school	(3) Secondary school	
(4) University or professional college	(5) Master	(6) Doctoral	
4. Current occupation			
(1) Legislative officer, high rank officer of public administration, head of organization or manager			
(2) Professional ( <i>professionals in various disciplines including higher education and secondary school teaching staff</i> )			
(3) Technician or professional assistant ( <i>persons mainly engaged in technical works in various disciplines including preschool, primary school and special education teachers</i> )			
(4) Office clerk ( <i>secretaries, secretarial work office clerks, cashiers, receptionists, ticket agents and workers of similar nature</i> )			
(5) Customer service or sales ( <i>persons who engaged in tourism, gambling, entertainment, catering, beauty treatment, insurance; including firemen, traffic and public security policemen, security staff, sales personnel etc.</i> )			
(6) Workers in the fishery or agricultural field ( <i>fishermen, farmers, and persons who engaged in storing and selling of fishery, agricultural, and livestock products etc.</i> )			
(7) Artisan or craftsman ( <i>including building and handicraft workers</i> )			
(8) Machine operator, driver or assembler			
(9) Non-technician ( <i>including cleaners, property management officers, postmen, porters</i> )			
(10) Others	(11) Unemployed	(12) Household duties	
5. Working environment			
(1) Outdoor	(2) Indoor ( <i>naturally ventilated</i> )	(3) Indoor ( <i>air conditioned</i> )	
6. Disease diagnosed by doctors within the past 5 years ( <i>If the answer is negative, skip to question 8.</i> )			
(1) Yes	(2) No		
7. Diseases experienced by the subject (in order of precedence, <i>at most three diseases</i> )			
(1) Cancer	(2) Cardiovascular diseases	(3) Respiratory	
(4) Accidental injury ( <i>damages to the human body that need treatments, or damages that affect normal activities</i> )			
(5) Digestive system	(6) Hypertension	(7) Endocrine diseases	
(8) Urinary or reproductive	(9) Diabetes	(10) Others	

**Please answer the following questions according to your status within the past half year**

8. Average working hours per week			
(1) Unemployed	(2) Less than 20 hrs	(3) 20~35 hrs	
(4) 35~40 hrs	(5) 40~50 hrs	(6) 50 hrs or more	
9. Average sleeping hours per day ( <i>including naps</i> )			
(1) Less than 6hrs	(2) 6~9 hrs	(3) 9 hrs or more	
10. Quality of sleep			
(1) Poor	(2) Reasonable	(3) Good	
11. Average cumulative walking hours per day ( <i>walks that last longer than 10 mins each time but not including walks during physical exercise</i> )			
(1) Less than 30 mins	(2) 30~60 mins	(3) 1~2 hrs	(4) 2 hrs or more





12. Average sitting time per day (during work, watching TV, commuting, using computer, dining or chatting etc.)					
(1) Less than 3 hrs	(2) 3~6 hrs	(3) 6~9 hrs			
(4) 9~12 hrs	(5) 12 hrs or more				
13. Cigarette consumption					
(1) None	(2) Less than 10 cigarettes per day	(3) 10~20 cigarettes per day			
(4) 20 cigarettes or more per day	(5) Stopped smoking for less than 2 years	(6) Stopped smoking for 2 years or more			
14. Duration of smoking (smokers only)					
(1) Less than 5 years	(2) 5~10 years	(3) 10~15 years	(4) 15 years or more		
15. Alcohol consumption (If choose choice (1), skip to question 18)					
(1) No	(2) Yes				
16. Frequency of drinking					
(1) Once per month	(2) 1~2 times per week	(3) 3~4 times per week	(4) 5~7 times per week		
17. Types of alcohol frequently consumed					
(1) Liquor	(2) Beer	(3) Yellow wine/Huangjiu	(4) Rice wine		
(5) Wine or fruit wine		(6) Mixed			
18. Activities frequently participated during leisure time (in order of precedence, at most three items)					
(1) Physical exercise	(2) Chess or poker	(3) Traveling	(4) Social gathering		
(5) AV entertainment	(6) House chores	(7) Sleeping	(8) Others		
19. Sports events frequently watched (in order of precedence, at most three items)					
(1) Basketball	(2) Volleyball	(3) Football	(4) Gymnastics	(5) Swimming	
(6) Martial arts	(7) Boxing	(8) Table tennis	(9) Billiards	(10) Golf	
(11) Badminton	(12) Water polo	(13) Baseball	(14) Softball	(15) Weight- lifting	
(16) Fencing	(17) Wrestling or judo	(18) Others			
20. Average frequency of sports activities per week (If choose choice (1), skip to question 28)					
(1) Never	(2) At most once	(3) 1~2 times			
(4) 3~4 times	(5) At least 5 times				
21. Average duration of sports activities each time					
(1) Less than 30 mins	(2) 30~60 mins	(3) At least 60 mins			
22. Duration of persistent exercising					
(1) Less than 6 months	(2) 6~12 months	(3) 1~3 years			
(4) 3~5 years	(5) 5 years or more				
23. Purposes of physical exercise (in order of precedence, at most three items)					
(1) To prevent or cure disease	(2) To improve physical fitness	(3) To lose Weight and keep fit			
(4) To relieve stress & regulate mood	(5) To socialize	(6) Others			



24. Types of sports frequently participated ( <i>in order of precedence, at most three items</i> )			<input type="text"/>	<input type="text"/>	<input type="text"/>
<i>(if choose choice (4), question 25 must be answered. If choice (4) is not chosen, skip question 25)</i>					
(1) Jogging	(2) Swimming	(3) Walking			
(4) Ball games	(5) Hiking	(6) Cycling			
(7) Working out	(8) Aerobics, yangko	(9) Martial arts or qigong			
(10) Boxing	(11) Fencing	(12) Yoga			
(13) Judo	(14) Taekwondo	(15) Karate			
(16) Others					
25. Ball games frequently participated ( <i>in order of precedence, at most three items</i> )			<input type="text"/>	<input type="text"/>	<input type="text"/>
(1) Basketball	(2) Volleyball	(3) Football	(4) Table tennis		
(5) Badminton	(6) Tennis	(7) Golf	(8) Billiards	(9) Others	
26. Locations of physical exercise ( <i>in order of precedence, at most three items</i> )			<input type="text"/>	<input type="text"/>	<input type="text"/>
(1) Stadium/arena	(2) Park	(3) Office or home			
(4) Open ground	(5) Road or street	(6) Recreational club	(7) Others		
27. Self-perception after physical exercise					<input type="text"/>
(1) Breathing and heart rate remained almost the same					
(2) Slight increase in breathing and heart rate, perspired slightly					
(3) Rapid breathing and increased heart rate, perspired greatly					
28. Main obstacles for participating in physical exercise			<input type="text"/>	<input type="text"/>	<input type="text"/>
<i>(in order of precedence, at most three items)</i>					
(1) Lack of interest		(2) Laziness			
(3) Healthy, not necessary to exercise		(4) Too weak, therefore not suitable to exercise			
(5) Frequently involved in labour intensive work, therefore not necessary to exercise					
(6) Lack of time		(7) Lack of locations and facilities			
(8) Lack of guidance		(9) Lack of organization			
(10) Lack of money		(11) Embarrassment			
(12) Others					
29. Have you ever heard of the "Physical Fitness Study"?					<input type="text"/>
(1) Yes		(2) No			
30. Have you ever participated in the "Physical Fitness Study"?					<input type="text"/>
(1) Yes		(2) No			
31. What is your understanding of the "Physical Fitness Study"?			<input type="text"/>	<input type="text"/>	<input type="text"/>
<i>(in order of precedence, at most three items)</i>					
(1) Meaningless		(2) To understand the physical fitness status of oneself			
(3) To recognize the importance of physical exercising		(4) To improve scientific knowledge of doing exercises			



**III. Testing Indexes (to be filled by examiner at location)**

<b>1. Height (cm)</b>				.	
2. Sitting height (cm)				.	
<b>3. Weight (kg)</b>				.	
4. Chest circumference (cm)				.	
5. Waist circumference (cm)				.	
6. Hip circumference (cm)				.	
7. Upper arm skinfold thickness (mm)				.	
8. Subscapular skinfold thickness (mm)				.	
9. Abdominal skinfold thickness (mm)				.	
10. Shoulder width (cm)				.	
11. Pelvis width (cm)				.	
12. Foot length (cm)				.	
13. Resting pulse (times/minute)					
14. Systolic pressure (mmHg)					
15. Diastolic pressure (mmHg)					
<b>16. Vital capacity (ml)</b>					
<b>17. Grip strength (kg)</b>				.	
<b>18. Vertical jump (cm)</b>				.	
<b>19. Push-ups (M)/One-minute sit-ups (F) (times)</b>					
20. Back strength (kg)					
<b>21. One foot stands with eyes closed (OFSEC) (sec)</b>					
<b>22. Selective respond time (sec)</b>				.	
<b>23. Sit and reach (cm)</b>				.	
<b>24. Step test</b>	<b>Time (sec)</b>				
	<b>Heart rate after 1min (times)</b>				
	<b>Heart rate after 2min (times)</b>				
	<b>Heart rate after 3min (times)</b>				

**Examiner:** \_\_\_\_\_




## IV. Adults (aged 40~59)

2010

Data Registration Manual for 2010 Physical Fitness Study of Macao SAR Citizens

Adults aged 40~59

 體育  
澳門特別行政區政府體育發展局  
Macao Sport Development Board, Macao SAR



Thank you for participating in our Physical Fitness Study! This study is organized by the Macao SAR Government to promote sports for all. Please be honest and serious when filling the questionnaire and undergoing the physical examination. We promise to keep your personal information confidential and that we will not publish or use it on its own. It will only be used as part of the whole study for analyzing. Thank you for your sincere participation.

For any questions on the questionnaire or testing, please contact Sports Medicine Center, Macau Sport Development Board!

Telephone: 2881 0896, 8893 4566, 8893 4540

<b>Name:</b>	_____
<b>Gender:</b>	_____
<b>Age:</b>	_____ (years)
<b>Working Unit:</b>	_____
<b>Telephone Number:</b>	_____
<b>Address:</b>	_____ _____



**Methods for filling in questionnaire:**

Please fill in the blanks with the corresponding numbers. For example, if you select Choice 1, please fill in the blank with "1". If the number happens to be two-digits, please put both digits in the same blank. For instance, if you select Choice 11, fill in the blank with 

1	1
---	---

. For multiple choice questions, if you only select one or two choice(s), please write down 0 for the rest of the blank(s).

**I. General Information**

1. Macao ID card number											
2. Gender	(1)M	(2)F									
3. Date of birth					Y			M			D
4. Examination date					Y			M			D
5. Working unit code number (to be filled by examiner)											
6. Serial number (to be filled by examiner)											
7. Years of residence in Macao (refers to years of continuous residence in Macao. If the time of leaving Macao was over 1 year, the years of residence in Macao shall be recalculated from the time of returning to Macao.)											
8. Category of occupation											
(1) labour intensive work (persons engaged in light or heavy labour, and mainly standing when working)											
(2) non-labour intensive work (persons engaged in intellectual work, and mainly sitting when working)											

**II. Questionnaire**

1. Birth place					
(1) Mainland	(2) Macao	(3) Hong Kong	(4) Portugal	(5) Others	
2. Community of residence					
(1) S. Francisco (Coloane)					
(2) Na. Sra. do Carmo (Taipa)					
(3) Paróquia de S. Lourenço (Zonas das Colinas da Barra e da Penha, da Praia do Manduco e do Porto Interior)					
(4) Paróquia da Sé Catedral (Zonas da Almeida Ribeiro, da Praia Grande, da Rua do Campo, dos Lotes norte e sul do Porto Exterior e da Zona do Lago Nam Van)					
(5) Paróquia de Santo António (Zonas da Freguesia de Santo António, do Oeste de Macau, incluindo Av. Horta e Costa, de San Kiu e do Patane)					
(6) Paróquia de S. Lázaro (Zona do Conselheiro Ferreira de Almeida e da Colina da Guia)					
(7) Paróquia de Nossa Senhora de Fátima (Zonas do Norte, incluindo Ilha Verde, Tamagnini Barbosa, Areia Preta, Fái Chi Kei e Reservatório)					
3. Education level					
(1) Below primary school education level		(2) Primary school		(3) Secondary school	
(4) University or professional college		(5) Master		(6) Doctoral	



4. Current occupation			
(1) Legislative officer, high rank officer of public administration, head of organization or manager			
(2) Professional ( <i>professionals in various disciplines including higher education and secondary school teaching staff</i> )			
(3) Technician or professional assistant ( <i>persons mainly engaged in technical works in various disciplines including preschool, primary school and special education teachers</i> )			
(4) Office clerk ( <i>secretaries, secretarial work office clerks, cashiers, receptionists, ticket agents and workers of similar nature</i> )			
(5) Customer service or sales ( <i>persons who engaged in tourism, gambling, entertainment, catering, beauty treatment, insurance; including firemen, traffic and public security policemen, security staff, sales personnel etc.</i> )			
(6) Workers in the fishery or agricultural field ( <i>fishermen, farmers, and persons who engaged in storing and selling of fishery, agricultural, and livestock products etc.</i> )			
(7) Artisan or craftsman( <i>including building and handicraft workers</i> )			
(8) Machine operator, driver or assembler			
(9) Non-technician( <i>including cleaners, property management officers, postmen, porters</i> )			
(10) Others	(11) Unemployed	(12) Household duties	

5. Working environment			
(1) Outdoor	(2) Indoor ( <i>naturally ventilated</i> )	(3) Indoor ( <i>air conditioned</i> )	

6. Disease diagnosed by doctors within the past 5 years ( <i>If the answer is negative, skip to question 8.</i> )			
(1) Yes	(2) No		

7. Diseases experienced by the subject (in order of precedence, <i>at most three diseases</i> )					
(1) Cancer	(2) Cardiovascular diseases	(3) Respiratory			
(4) Accidental injury ( <i>damages to the human body that need treatments, or damages that affect normal activities</i> )					
(5) Digestive system	(6) Hypertension	(7) Endocrine diseases			
(8) Urinary or reproductive	(9) Diabetes	(10) Others			

**Please answer the following questions according to your status within the past half year**

8. Average working hours per week			
(1) Unemployed	(2) Less than 20 hrs	(3) 20~35 hrs	
(4) 35~40 hrs	(5) 40~50 hrs	(6) 50 hrs or more	

9. Average sleeping hours per day ( <i>including naps</i> )			
(1) Less than 6hrs	(2) 6~9 hrs	(3) 9 hrs or more	

10. Quality of sleep			
(1) Poor	(2) Reasonable	(3) Good	

11. Average cumulative walking hours per day( <i>walks that last longer than 10 mins each time but not including walks during physical exercise</i> )				
(1) Less than 30 mins	(2) 30~60 mins	(3) 1~2 hrs	(4) 2 hrs or more	

12. Average sitting time per day ( <i>during work, watching TV, commuting, using computer, dining or chatting etc.</i> )			
(1) Less than 3 hrs	(2) 3~6 hrs	(3) 6~9 hrs	
(4) 9~12 hrs	(5) 12 hrs or more		



13. Cigarette consumption				
(1) None	(2) Less than 10 cigarettes per day	(3) 10~20 cigarettes per day		
(4) 20 cigarettes or more per day	(5) Stopped smoking for less than 2 years	(6) Stopped smoking for 2 years or more		
14. Duration of smoking ( <i>smokers only</i> )				
(1) Less than 5 years	(2) 5~10 years	(3) 10~15 years	(4) 15 years or more	
15. Alcohol consumption ( <i>If choose choice (1), skip to question 18</i> )				
(1) No	(2) Yes			
16. Frequency of drinking				
(1) Once per month	(2) 1~2 times per week	(3) 3~4 times per week	(4) 5~7 times per week	
17. Types of alcohol frequently consumed				
(1) Liquor	(2) Beer	(3) Yellow wine/ Huangjiu	(4) Rice wine	
(5) Wine or fruit wine	(6) Mixed			
18. Activities frequently participated during leisure time ( <i>in order of precedence, at most three items</i> )				
(1) Physical exercise	(2) Chess or poker	(3) Traveling	(4) Social gathering	
(5) AV entertainment	(6) House chores	(7) Sleeping	(8) Others	
19. Sports events frequently watched ( <i>in order of precedence, at most three items</i> )				
(1) Basketball	(2) Volleyball	(3) Football	(4) Gymnastics	(5) Swimming
(6) Martial arts	(7) Boxing	(8) Table tennis	(9) Billiards	(10) Golf
(11) Badminton	(12) Water polo	(13) Baseball	(14) Softball	(15) Weight- lifting
(16) Fencing	(17) Wrestling or judo	(18) Others		
20. Average frequency of sports activities per week ( <i>If choose choice (1), skip to question 28</i> )				
(1) Never	(2) At most once	(3) 1~2 times		
(4) 3~4 times	(5) At least 5 times			
21. Average duration of sports activities each time				
(1) Less than 30 mins	(2) 30~60 mins	(3) At least 60 mins		
22. Duration of persistent exercising				
(1) Less than 6 months	(2) 6~12 months	(3) 1~3 years		
(4) 3~5 years	(5) 5 years or more			
23. Purposes of physical exercise ( <i>in order of precedence, at most three items</i> )				
(1) To prevent or cure disease	(2) To improve physical fitness	(3) To lose Weight and keep fit		
(4) To relieve stress & regulate mood	(5) To socialize	(6) Others		





24. Types of sports frequently participated ( <i>in order of precedence, at most three items</i> )				<input type="text"/>	<input type="text"/>	<input type="text"/>
<i>(if choose choice (4), question 25 must be answered. If choice (4) is not chosen, skip question 25)</i>						
(1) Jogging	(2) Swimming	(3) Walking				
(4) Ball games	(5) Climbing	(6) Cycling				
(7) Working out	(8) Aerobics, yangko	(9) Martial arts or qigong				
(10) Boxing	(11) Fencing	(12) Yoga				
(13) Judo	(14) Taekwondo	(15) Karate				
(16) Others						
25. Ball games frequently participated ( <i>in order of precedence, at most three items</i> )				<input type="text"/>	<input type="text"/>	<input type="text"/>
(1) Basketball	(2) Volleyball	(3) Football	(4) Table tennis			
(5) Badminton	(6) Tennis	(7) Golf	(8) Billiards	(9) Others		
26. Locations of physical exercise ( <i>in order of precedence, at most three items</i> )				<input type="text"/>	<input type="text"/>	<input type="text"/>
(1) Stadium/arena	(2) Park	(3) Office or home				
(4) Open ground	(5) Road or street	(6) Recreational club	(7) Others			
27. Self-perception after physical exercise						<input type="text"/>
(1) Breathing and heart rate remained almost the same						
(2) Slight increase in breathing and heart rate, perspired slightly						
(3) Rapid breathing and increased heart rate, perspired greatly						
28. Main obstacles for participating in physical exercise <i>(in order of precedence, at most three items)</i>				<input type="text"/>	<input type="text"/>	<input type="text"/>
(1) Lack of interest		(2) Laziness				
(3) Healthy, not necessary to exercise		(4) Too weak, therefore not suitable to exercise				
(5) Frequently involved in labour intensive work, therefore not necessary to exercise						
(6) Lack of time			(7) Lack of locations and facilities			
(8) Lack of guidance			(9) Lack of organization			
(10) Lack of money			(11) Embarrassment			
(12) Others						
29. Have you ever heard of the "Physical Fitness Study"?						<input type="text"/>
(1) Yes		(2) No				
30. Have you ever participated in the "Physical Fitness Study"?						<input type="text"/>
(1) Yes		(2) No				
31. What is your understanding of the "Physical Fitness Study"?				<input type="text"/>	<input type="text"/>	<input type="text"/>
<i>(in order of precedence, at most three items)</i>						
(1) Meaningless		(2) To understand the physical fitness status of oneself				
(3) To recognize the importance of physical exercising		(4) To improve scientific knowledge of doing exercises				



**III. Testing Indexes (to be filled by examiner at location)**

<b>1. Height (cm)</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	.	<input type="text"/>
2. Sitting height (cm)	<input type="text"/>	<input type="text"/>	<input type="text"/>	.	<input type="text"/>
<b>3. Weight (kg)</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	.	<input type="text"/>
4. Chest circumference (cm)	<input type="text"/>	<input type="text"/>	<input type="text"/>	.	<input type="text"/>
5. Waist circumference (cm)	<input type="text"/>	<input type="text"/>	<input type="text"/>	.	<input type="text"/>
6. Hip circumference (cm)	<input type="text"/>	<input type="text"/>	<input type="text"/>	.	<input type="text"/>
7. Upper arm skinfold thickness (mm)	<input type="text"/>	<input type="text"/>	<input type="text"/>	.	<input type="text"/>
8. Subscapular skinfold thickness (mm)	<input type="text"/>	<input type="text"/>	<input type="text"/>	.	<input type="text"/>
9. Abdominal skinfold thickness (mm)	<input type="text"/>	<input type="text"/>	<input type="text"/>	.	<input type="text"/>
10. Shoulder width (cm)	<input type="text"/>	<input type="text"/>	<input type="text"/>	.	<input type="text"/>
11. Pelvis width (cm)	<input type="text"/>	<input type="text"/>	<input type="text"/>	.	<input type="text"/>
12. Foot length (cm)	<input type="text"/>	<input type="text"/>	<input type="text"/>	.	<input type="text"/>
13. Resting pulse (times/minute)	<input type="text"/>	<input type="text"/>	<input type="text"/>		
14. Systolic pressure (mmHg)	<input type="text"/>	<input type="text"/>	<input type="text"/>		
15. Diastolic pressure (mmHg)	<input type="text"/>	<input type="text"/>	<input type="text"/>		
<b>16. Vital capacity (ml)</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<b>17. Grip strength (kg)</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	.	<input type="text"/>
<b>18. One foot stands with eyes closed (OFSEC) (sec)</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>		
<b>19. Selective respond time (sec)</b>	<input type="text"/>	.	<input type="text"/>	<input type="text"/>	<input type="text"/>
<b>20. Sit and reach (cm)</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	.	<input type="text"/>
<b>21. Step test</b>	<b>Time (sec)</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
	<b>Heart rate after 1min (times)</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
	<b>Heart rate after 2min (times)</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
	<b>Heart rate after 3min (times)</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Examiner:** \_\_\_\_\_




## V. Seniors

**2010**

Data Registration Manual for 2010 Physical Fitness Study of Macao SAR Citizens

**Seniors aged 60~69**

 體育  
澳門特別行政區政府體育發展局  
Macao Sport Development Board, Macao SAR



Thank you for participating in our Physical Fitness Study! This study is organized by the Macao SAR Government to promote sports for all. Please be honest and serious when filling the questionnaire and undergoing the physical examination. We promise to keep your personal information confidential and that we will not publish or use it on its own. It will only be used as part of the whole study for analyzing. Thank you for your sincere participation.

For any questions on the questionnaire or testing, please contact Sports Medicine Center, Macau Sport Development Board!

Telephone: 2881 0896, 8893 4566, 8893 4540

<b>Name:</b>	_____
<b>Gender:</b>	_____
<b>Age:</b>	_____ (years)
<b>Senior Center:</b>	_____
<b>Telephone Number:</b>	_____
<b>Address:</b>	_____ _____



**Methods for filling in questionnaire:**

Please fill in the blanks with the corresponding numbers. For example, if you select Choice 1, please fill in the blank with "1". If the number happens to be two-digits, please put both digits in the same blank. For instance, if you select Choice 11, fill in the blank with **11**. For multiple choice questions, if you only select one or two choice(s), please write down **0** for the rest of the blank(s).

**I. General Information**

1. Macao ID card number											
2. Gender	(1)M	(2)F									
3. Date of birth					Y			M			D
4. Examination date					Y			M			D
5. Senior center code number (to be filled by examiner)											
6. Serial number (to be filled by examiner)											
7. Years of residence in Macao (refers to years of continuous residence in Macao. If the time of leaving Macao was over 1 year, the years of residence in Macao shall be recalculated from the time of returning to Macao.)											

**II. Questionnaire**

1. Birth place	
(1) Mainland	(2) Macao
(3) Hong Kong	(4) Portugal
(5) Others	
2. Community of residence	
(1) S. Francisco (Coloane)	
(2) Na. Sra. do Carmo (Taipa)	
(3) Paróquia de S. Lourenço (Zonas das Colinas da Barra e da Penha, da Praia do Manduco e do Porto Interior)	
(4) Paróquia da Sé Catedral (Zonas da Almeida Ribeiro, da Praia Grande, da Rua do Campo, dos Lotes norte e sul do Porto Exterior e da Zona do Lago Nam Van)	
(5) Paróquia de Santo António (Zonas da Freguesia de Santo António, do Oeste de Macau, incluindo Av. Horta e Costa, de San Kiu e do Patane)	
(6) Paróquia de S. Lázaro (Zona do Conselheiro Ferreira de Almeida e da Colina da Guia)	
(7) Paróquia de Nossa Senhora de Fátima (Zonas do Norte, incluindo Ilha Verde, Tamagnini Barbosa, Areia Preta, Fái Chi Kei e Reservatório)	
3. Education level	
(1) Below primary school education level	(2) Primary school
(3) Secondary school	
(4) University or professional college	(5) Master
(6) Doctoral	
4. Retired	
(1) Yes	(2) No



5. Occupation before retirement/current occupation			
(1) Legislative officer, high rank officer of public administration, head of organization or manager			
(2) Professional ( <i>professionals in various disciplines including higher education and secondary school teaching staff</i> )			
(3) Technician or professional assistant ( <i>persons mainly engaged in technical works in various disciplines including preschool, primary school and special education teachers</i> )			
(4) Office clerk ( <i>secretaries, secretarial work office clerks, cashiers, receptionists, ticket agents and workers of similar nature</i> )			
(5) Customer service or sales ( <i>persons who engaged in tourism, gambling, entertainment, catering, beauty treatment, insurance; including firemen, traffic and public security policemen, security staff, sales personnel etc.</i> )			
(6) Workers in the fishery or agricultural field ( <i>fishermen, farmers, and persons who engaged in storing and selling of fishery, agricultural, and livestock products etc.</i> )			
(7) Artisan or craftsman ( <i>including building and handicraft workers</i> )			
(8) Machine operator, driver or assembler			
(9) Non-technician ( <i>including cleaners, property management officers, postmen, porters</i> )			
(10) Others	(11) Unemployed	(12) Household duties	

6. Occupation category before retirement/current occupation category			
(1) labour intensive work ( <i>persons engaged in light or heavy labour, and mainly standing when working</i> )			
(2) non-labour intensive work ( <i>persons engaged in intellectual work, and mainly sitting when working</i> )			

7. Working environment before retirement/current working environment			
(1) Outdoor	(2) Indoor ( <i>naturally ventilated</i> )	(3) Indoor ( <i>air conditioned</i> )	

8. Disease diagnosed by doctors within the past 5 years ( <i>If the answer is negative, skip to question 10.</i> )			
(1) Yes	(2) No		

9. Diseases experienced by the subject (in order of precedence, <i>at most three diseases</i> )					
(1) Cancer	(2) Cardiovascular diseases	(3) Respiratory			
(4) Accidental injury ( <i>damages to the human body that need treatments, or damages that affect normal activities</i> )					
(5) Digestive system	(6) Hypertension	(7) Endocrine diseases			
(8) Urinary or reproductive	(9) Diabetes	(10) Others			

**Please answer the following questions according to your status within the past half year**

10. Average working hours per week			
(1) Unemployed	(2) Less than 20 hrs	(3) 20~35 hrs	
(4) 35~40 hrs	(5) 40~50 hrs	(6) 50 hrs or more	

11. Average sleeping hours per day (including naps)			
(1) Less than 6hrs	(2) 6~9 hrs	(3) 9 hrs or more	

12. Quality of sleep			
(1) Poor	(2) Reasonable	(3) Good	

13. Average cumulative walking hours per day ( <i>walks that last longer than 10 mins each time but not including walks during physical exercise</i> )				
(1) Less than 30 mins	(2) 30~60 mins	(3) 1~2 hrs	(4) 2 hrs or more	



14. Average sitting time per day ( <i>during work, watching TV, commuting, using computer, dining or chatting etc.</i> )				
(1) Less than 3 hrs	(2) 3~6 hrs	(3) 6~9 hrs		
(4) 9~12 hrs	(5) 12 hrs or more			
15. Cigarette consumption				
(1) None	(2) Less than 10 cigarettes per day	(3) 10~20 cigarettes per day		
(4) 20 cigarettes or more per day	(5) Stopped smoking for less than 2 years	(6) Stopped smoking for 2 years or more		
16. Duration of smoking ( <i>smokers only</i> )				
(1) Less than 5 years	(2) 5~10 years	(3) 10~15 years	(4) 15 years or more	
17. Alcohol consumption ( <i>If choose choice (1), skip to question 20</i> )				
(1) No	(2) Yes			
18. Frequency of drinking				
(1) Once per month	(2) 1~2 times per week	(3) 3~4 times per week	(4) 5~7 times per week	
19. Types of alcohol frequently consumed				
(1) Liquor	(2) Beer	(3) Yellow wine/ Huangjiu	(4) Rice wine	
(5) Wine or fruit wine	(6) Mixed			
20. Activities frequently participated during leisure time ( <i>in order of precedence, at most three items</i> )				
(1) Physical exercise	(2) Chess or poker	(3) Traveling	(4) Social gathering	
(5) AV entertainment	(6) House chores	(7) Sleeping	(8) Others	
21. Sports events frequently watched (in order of precedence, at most three items)				
(1) Basketball	(2) Volleyball	(3) Football	(4) Gymnastics	(5) Swimming
(6) Martial arts	(7) Boxing	(8) Table tennis	(9) Billiards	(10) Golf
(11) Badminton	(12) Water polo	(13) Baseball	(14) Softball	(15) Weight- lifting
(16) Fencing	(17) Wrestling or judo	(18) Others		
22. Average frequency of sports activities per week ( <i>If choose choice (1), skip to question 29</i> )				
(1) Never	(2) At most once	(3) 1~2 times		
(4) 3~4 times	(5) At least 5 times			
23. Average duration of sports activities each time				
(1) Less than 30 mins	(2) 30~60 mins	(3) At least 60 mins		
24. Duration of persistent exercising				
(1) Less than 6 months	(2) 6~12 months	(3) 1~3 years		
(4) 3~5 years	(5) 5 years or more			
25. Purposes of physical exercise ( <i>in order of precedence, at most three items</i> )				
(1) To prevent or cure disease	(2) To improve physical fitness	(3) To lose Weight and keep fit		
(4) To relieve stress & regulate mood	(5) To socialize	(6) Others		



26. Types of sports frequently participated ( <i>in order of precedence, at most three items</i> )					
(1) Jogging	(2) Swimming	(3) Walking			
(4) Ball games	(5) Climbing	(6) Cycling			
(7) Working out	(8) Aerobics, yangko	(9) Martial arts or qigong			
(10) Others					
27. Locations of physical exercise ( <i>in order of precedence, at most three items</i> )					
(1) Stadium/arena	(2) Park	(3) Office or home			
(4) Open ground	(5) Road or street	(6) Recreational club	(7) Others		
28. Self-perception after physical exercise					
(1) Breathing and heart rate remained almost the same					
(2) Slight increase in breathing and heart rate, perspired slightly					
(3) Rapid breathing and increased heart rate, perspired greatly					
29. Main obstacles for participating in physical exercise ( <i>in order of precedence, at most three items</i> )					
(1) Lack of interest		(2) Laziness			
(3) Healthy, not necessary to exercise		(4) Too weak, therefore not suitable to exercise			
(5) Frequently involved in labour intensive work, therefore not necessary to exercise					
(6) Lack of time		(7) Lack of locations and facilities			
(8) Lack of guidance		(9) Lack of organization			
(10) Lack of money		(11) Embarrassment			
(12) Others					
30. Have you ever heard of the "Physical Fitness Study"?					
(1) Yes		(2) No			
31. Have you ever participated in the "Physical Fitness Study"?					
(1) Yes		(2) No			
32. What is your of the "Physical Fitness Study"?					
(1) Meaningless			(2) To understand the physical fitness status of oneself		
(3) To recognize the importance of physical exercising			(4) To improve scientific knowledge of doing exercises		





**III. Testing Indexes (to be filled by examiner at location)**

<b>1. Height (cm)</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	.	<input type="text"/>
2. Sitting height (cm)	<input type="text"/>	<input type="text"/>	<input type="text"/>	.	<input type="text"/>
<b>3. Weight (kg)</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	.	<input type="text"/>
4. Chest circumference (cm)	<input type="text"/>	<input type="text"/>	<input type="text"/>	.	<input type="text"/>
5. Waist circumference (cm)	<input type="text"/>	<input type="text"/>	<input type="text"/>	.	<input type="text"/>
6. Hip circumference (cm)	<input type="text"/>	<input type="text"/>	<input type="text"/>	.	<input type="text"/>
7. Upper arm skinfold thickness (mm)	<input type="text"/>	<input type="text"/>	<input type="text"/>	.	<input type="text"/>
8. Subscapular skinfold thickness (mm)	<input type="text"/>	<input type="text"/>	<input type="text"/>	.	<input type="text"/>
9. Abdominal skinfold thickness (mm)	<input type="text"/>	<input type="text"/>	<input type="text"/>	.	<input type="text"/>
10. Shoulder width (cm)	<input type="text"/>	<input type="text"/>	<input type="text"/>	.	<input type="text"/>
11. Pelvis width (cm)	<input type="text"/>	<input type="text"/>	<input type="text"/>	.	<input type="text"/>
12. Foot length (cm)	<input type="text"/>	<input type="text"/>	<input type="text"/>	.	<input type="text"/>
13. Resting pulse (times/minute)	<input type="text"/>	<input type="text"/>	<input type="text"/>		
14. Systolic pressure (mmHg)	<input type="text"/>	<input type="text"/>	<input type="text"/>		
15. Diastolic pressure (mmHg)	<input type="text"/>	<input type="text"/>	<input type="text"/>		
<b>16. Vital capacity (ml)</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>		
<b>17. Grip strength (kg)</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	.	<input type="text"/>
<b>18. One foot stands with eyes closed (OFSEC) (sec)</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>		
<b>19. Selective respond time (sec)</b>	<input type="text"/>	.	<input type="text"/>		
<b>20. Sit and reach (cm)</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	.	<input type="text"/>

**Examiner:** \_\_\_\_\_

## **Appendix 2 : Methods for Filling out “2010 Physical Fitness Study of Macao SAR Citizens” Questionnaire**

### **1. Basic Information**

Name, gender and age were important information used to classify subjects into different categories and to file data registration manuals. Therefore, they should be honest. They could be filled out either by subjects themselves or by examiners after examination. When filling, examiners needed to pay attention to the accuracy and integrity of the information. If any uncertainty occurred, they should consult the subjects face to face. All questions must be filled. After examination, these manuals should be filed and saved according to gender and age group timely. Requirements for filling out the first page of the manual were as follows:

#### **1.1. Name and Gender**

Truthful information was to be filled.

#### **1.2. Age**

Age was to be filled after calculation by methods mentioned in **Sampling Method of Part One “Physical Fitness Study and implementation”**.

#### **1.3. Name, Address and Telephone Number of Kindergarten, School, Working Unit and Affiliated Unit**

Names of these institutes were to be filled on the lines. For young children who had not attended kindergartens, “Have not attended kindergarten” should be written down. For seniors, name of the senior center should be written down.

Current and easily accessible telephone number should be written down.

Address needed to be home address.

#### **Special explanations:**

**Before examination, examiners needed to remind the subjects to read the explanations in the manuals in order to have a sound understanding of the study.**

### **2. Category by Code**

#### **2.1. Macao ID Card Number**

Subjects should provide truthful information.

#### **2.2. Gender**

The national gender code system was adopted. 1 represented male and 2 represented female.

### 2.3. Date of Birth and Examination Date

Dates were to be filled according to western calendar. Examination date referred to the date the subject started to participate in the examination and would be filled out by the examiners. Methods for filling were as follows:

The first four blanks were for year; the fifth and sixth blanks for month (If subjects were born from January to September, the fifth blank should be “0”); the seventh and eighth blanks for day (If subjects were born on dates ranging from 1st to 9th, the seventh blank should be “0”)

e.g.: a subject was born on 12th April, 1964 and the examination date was 12th April, 2010, the manual should be filled in as follows:

Date of birth:	1	9	6	4	Y	0	4	M	1	2	D
Examination date:	2	0	1	0	Y	0	4	M	1	2	D

### 2.4. Code Number of Kindergarten, School, Working Unit and Affiliated Unit

Before examination, participating institutes were coded by the Physical Fitness Monitor Center for Macao Citizens with numbers and they were registered and saved accordingly.

For the original sampling sites in 2005, "0" was added to the original code numbers. Kindergarten code numbers: 001~020. School code numbers: 021~040. Working units code numbers: 041~070. Senior center code numbers: 071~099.

The newly increased sampling sites in 2010 were coded in sequence. Kindergarten code numbers: 101~120. School code numbers: 121~140. Working units code numbers: 141~170. Senior center code numbers: 171~199. When filling, each digit should occupy one blank.

E.g.: the code number for Macao University of Science and Technology was “28” (**original sampling site in 2005**), then the blanks would be:

0	2	8
---	---	---

E.g.: the code number for Macao St. Joseph University was "21" (**new sampling site in 2010**), then the blanks would be:

1	2	1
---	---	---

### 2.5. Serial Number

Serial number referred to subject’s code number. Supervised by Physical Fitness Monitor Center for Macao Citizens, subjects were coded according to categories: young children, students, adults and seniors, age groups and genders. Examiners filled in the serial numbers and kept them for reference. Serial number ranged from 0001-9999.

**2.6. Years of Residence in Macao**

This question referred to the number of years the subjects had continuously been living in Macao.

e.g. If a subject had lived in Macao for 8 years, it would be:

0	8
---	---

**2.7. Occupation Code**

This item was for adults only. Labour intensive work referred to light or heavy labour-intensive work such as salesman, customer service personnel, technician and professional assistant, worker in the fishery and agricultural field, artisan, craftsman, machine operator, driver or assembler. Non-labour intensive work referred to intellectual works such as head of organization, professional, technician, office clerk etc. Code 1 was labour intensive work; code 2 was non-labour intensive work.

e.g.: If a subject was an office clerk, it would be:

2
---

**3. Questionnaire**

**3.1 Types of Questionnaire and Filling Methods**

Questionnaire was composed of both single choice and multiple choice questions.

**3.1.1. Single Choice Question**

Subjects should select a choice closest to their situation and put the corresponding number in the blank.

e.g. If the guardian of a young child was an elderly person, the corresponding number for Question 14 would be 2. The blank would be:

2
---

If the corresponding number was two-digits, both digits should be filled in the same blank. For instance, if the answer was (11), the blank would be:

11
----

**3.1.2. Multiple Choice Question**

Subjects selected choices (at most 3 choices) closest to their situation and put the corresponding numbers in the blanks according to their precedence.

If a subject only selected one or two choice(s), the last one or two blank(s) needed to be filled in with a “0”. As a reminder, subject needed to select at least one choice for multiple choice questions.

For example: A young child had three hobby classes during his spare time: sports activities, tutoring, dancing and music, then the blanks would be:

2	3	5
---	---	---

Another example: A subject had only selected “sports activities”, the blank would be:

2	0	0
---	---	---

Before filling out the questionnaire, examiners should remind subjects to read the questions and answered with care in order to avoid errors.

### 3.2. Methods for Filling in Questionnaire for Each Age Group

#### 3.2.1. Questionnaire for Young Children

The questionnaire for young children included three parts: information about the young children, paternal and maternal personal information. Information of the young children could be completed by their parents.

##### Information of young children

###### (1) Birth place

This referred to the place where the birth certificate of the child was issued by hospital.

e.g. If the child was born in Macao, the blank would be:

2
---

###### (2) Community of residence

This referred to the community the subject lived in.

e.g. If a subject lived in S. Francisco, the blank would be:

1
---

###### (3) Birth weight and birth length

These should be according to the birth certificate issued by the hospital. If it was not clear, the blank should be filled in with 99.9.

###### (4) Gestational age

This should be identified by the hospital or doctor. Usually, a gestational age of 40 weeks was medically considered as term (standard). Premature birth referred to birth at least two weeks before term. Post-term referred to birth at least two weeks after term. Term birth was birth within two weeks before or after term.

###### (5) Types of feeding within 4 months after birth

Formula feeding referred to any feedings other than breast milk (e.g. milk or milk powder). Mixed feeding referred to the combination of breast feeding and formula feeding.

###### (6) Number of siblings and birth order

This referred to the number of brothers and sisters in the family. If the subject was an only child, fill in the blank with 0.

**(7) Frequency of flu or fever within the past year**

This referred to flu occurred within one year from the examination date. Flu symptoms included stuffy nose, runny nose, sneezing, sore throat, fever, muscle pain; sometimes incurred along with gastrointestinal problems such as stomach ache, vomiting or diarrhea.

**(8) Diseases experienced**

This referred to whether the young children had been diagnosed with any diseases since birth. The disease needed to be diagnosed by doctors in a hospital. This was a multiple choice question with at most 3 disease choices. The information filled should be truthful and according to diagnosis from a hospital. If the disease diagnosed could not be found from the choices, then selected “others”. If no diseases had been experienced, selected “no” and skipped to question 11.

**(9) Sleeping time**

This referred to the average sleeping hours (nap time included) per day in the past half year.

**(10) Kindergarten attendance**

Half day meant the young children only spent half a day at kindergarten. Full day meant the young children spent a full day at kindergarten but night time at home. Boarding referred to the young children living at the kindergarten and returned home during weekends or holidays.

**(11) Guardian**

This referred to the person who took care of the child at home and who spent most time with the child. The goal was to investigate who was most influential on the child’s habits and behavior.

**(12) Hobby classes**

This was a multiple choice question. It referred to the types of hobby classes the young children participated.

e.g.: A subject took sports activities, tutoring and chess as hobby classes, then the blanks would be:

2	3	4
---	---	---

If the subject did not attend any hobby classes, the blanks should be filled in with 1, 0, 0.

**(13) Average time spent on outdoor activities per day**

This referred to the average time per day spent at outdoor activities, exercises and sports activities within the past half year.

**(14) Time spent on watching TV, video or playing video games per day**

This referred to the average time per day spent on watching TV, video or playing video games within the past half year.

**(15) Types of sports frequently participated**

This was a multiple choice question. It mainly referred to the sports activities played outside of

kindergarten which could include hobby classes or activities at recreational clubs.

**Parental personal information****(1) Date of birth**

Truthful information was required.

**(2) Birth place**

Refer to 3.2.1 (1) in Appendix 2 in the information of young children.

**(3) Years of residence in Macao**

This referred to the number of years the subjects' parents had lived in Macao continuously.

**(4) Height and weight**

If possible, the kindergartens or examiners provided assistance in measuring the parents' weight and height before filling these two blanks in order to obtain accurate data.

**(5) Education level**

This referred to the highest education level the subjects' parents attended which could be proved by diplomas or certificates.

**(6) Occupation**

This referred to current occupation of the subjects' parents.

According to "Macao Occupational Classification" (1997), the explanations of each occupation were as follows:

**① Legislative officer, high rank officer of public administration, head of organization or manager**

This referred to one who recommended, made decision and formulated legislative or public policies and regulations in the government, municipal or community groups; the person also planned, guided and coordinated activities of enterprises, institutions and relevant departments. This would include legislative officer, high rank officer of public administration and head of organization or small enterprise manager (administrator). Legislative officer referred to one who decided, formulated, guided, advised, authorized, modified and abolished government or municipal policies, laws and regulations. This would include chief executives, legislative council members, advisory council members and municipal council members.

High rank officer of public administration referred to one who engaged in the formulation of government or municipal policies, directed and supervised the interpretation and implementation of policies and laws, represented regional government in other countries and regions, coordinated work between government departments and supervised work of others. This would include directors, director generals of each department or bureau, high commissioners, secretary-generals and persons of similar nature.

Head of organization referred to one who formulated and implemented policies in political groups, chamber of commerce, labour unions; also in professional, industrial or athletic associations etc. This

person represented relevant organizations and their members in the negotiation and protection of their interests and rights from legislative bodies and government. This would include heads of political organizations, chambers of commerce, labour unions; charity professional; community and athletic organizations.

Enterprise manager referred to one who formulated policies, planned, guided and coordinated the operation of enterprises, organizations (with ten or more staff) or departments. This would include enterprise directors, general managers, presidents and department managers.

Small enterprise manager (administrator) referred to one who managed a small enterprise (with at most ten staff), planned, formulated and implemented policies, supervised daily work, assessed performance, negotiated with suppliers and other enterprises; planned, recruited and managed human resources; submitted report to employer. This would include administrators of various industries such as agriculture, forestry, fishery, construction, mining, manufacturing, wholesale, retail trading, hotel and restaurant business, transportation, tourism, communication, banking, commercial, insurance, real estate and social work.

#### ② Professional

Referred to one who engaged in analysis, research and development, theory and operation,; applied knowledge and made recommendations in the fields of natural science (including mathematics, engineering and technologies), life science (including medical science), social science and human science; involved in teaching, provided commercial, legal and social services; participated in arts creation; provided spiritual guidance and published academic papers. This would include professionals in physics, mathematics, engineering, life science, health; teaching staff in higher and secondary education or similar professions; professionals in law, administration, commerce, social science and human science etc.

#### ③ Technician or professional assistant

Referred to one who engaged in the study and application of natural science (including mathematics, engineering and technologies), life science (including medical science) social science and human science; teaching staff of primary school, preschool and special education for people with physical and mental disabilities; engaged in technical work in commerce, finance, administration and social services; directed arts and recreational sports activities. This would include technicians or assistants in physics, chemistry, engineering, life science and health science; professionals in primary school, preschool and similar aspects; technicians or assistants in administration, commerce, social services and law etc.

#### ④ Office clerk

Referred to one who engaged in shorthand, typewriting, word processing and office equipment operation; input data into computers; performed secretarial work; recorded and calculated data; handled inventory, manufacturing and transportation records; handled passenger and flight records; performed library works, processed documents, provided postal services, performed accounting duties, made travel



arrangement, provided customers with necessary resources, made appointments, arranged meetings, answered telephone etc. This would include office clerks, cashiers, tellers, receptionists, ticket agents and personnel of similar nature.

⑤ Customer service or sales

Referred to one who engaged in tourism, domestic services, foods and beverages preparation and supplies, child care; beauty, make-up, escort, astrology or fortune-telling services. Person who provided personal or property security and criminal prevention services, served as arts or commercial models, participated in business sales or marketing, demonstrated commodities to customers. This would include security officers, models, salesmen and demonstrators.

⑥ Workers in the fishery or agricultural field

Referred to one who engaged in the preparation and cultivation of agricultural lands; prepared seeds, grew plants, fruits and vegetables, applied fertilizer and harvested products; raised livestock for meat, milk, leather and other animal products; engaged in catching, storing and selling of marine products and mollusks. This would include skilled workers in fishery, agriculture and animal husbandry fields.

⑦ Artisan or craftsman

Referred to one who exploited and processed minerals; built, maintained and repaired buildings and other structures; casted, welded and processed metals; constructed metal frameworks; built machines, tools, equipments and other metal products; maintained and repaired craft machines; manufactured precise instruments, jewelries, household appliances, precious metal items, ceramics and glass products; manufactured handicrafts; printing; manufactured and processed foods, textile, wood, leather or other products. This would include workers in mining, construction, metal and machinery, precision instrument, printing, handicraft, food processing, wood handling, textile, leather industries etc.

⑧ Machine operator, driver or assembler

Referred to one who operated, monitored and handled materials such as wood, metal, industrial machines and tools etc.; assembled multi-component products under specific programs; operated vehicles, mobile machines and equipments. This would include operators of machine, vehicle, vessel, heavy mobile equipment and product assemblers.

⑨ Non-technician

Referred to one who engaged in mobile sales of goods; cleaned houses, hotels and offices; guarded apartment buildings; collected garbage; delivered mails, documents and parcels; collected money from vending machines; carried luggage; drove passengers in a rickshaw; engaged in simple works related to construction, manufacturing, transportation, fishery and agriculture industries. This would include non-technicians in sales and services, fishery and agriculture, mining, construction, manufacturing and transportation.

⑩ Others not listed in the above classifications.

In addition, explanations of the following two choices were:

⑪ Unemployed: referred to one who had not reached retirement age but was able to work; however, presently jobless.

⑫ Household duties: referred to one who had not reached retirement age but was able to work; however, presently engaged in household duties at home instead of working.

### **(7) Sports activities**

Sports activities referred to all kinds of exercises, either with or without the help of equipments to increase fitness, stress management or life enrichment.

Please be truthful when filling. If the subjects' parents never participated in any sports activities, they could skip question 9 and 10, while for those who played sports could select at most three sports.

### **3.2.2. Questionnaire for Children and Adolescents (Students)**

Primary school students could fill out this questionnaire with the help of their parents. Secondary school and university students needed to complete the questionnaire by themselves.

#### **(1) Birth place and community of residence**

Refer to 3.2.1 (1), (2) in Appendix 2 in the information of young children.

#### **(2) Diseases experienced**

This referred to any disease experienced within the past five years. The type of diseases should be diagnosed by doctors and the maximum number of diseases written down should not be more than three. If disease experienced could not be found from the choices, select "others". If no disease had been experienced, "no" was selected and then skipped to question 5.

#### **(3) Number of siblings and birth order**

Refer to 3.2.1 (6) in Appendix 2 in the information of young children.

#### **(4) School attendance**

Half day referred to subjects only spent half a day at school. Full day referred full day at school but night time at home. Boarding referred living at school and returned home during weekends or holidays.

#### **(5) Transportation means and commuting time**

This referred to the transportation methods and total commuting time the student s traveled to and from school within the past half year. Accurate answer was required.

#### **(6) Sports activity class**

This referred to how students felt after PE classes within the past half year. Changes in breathing and

heart rates were two important indexes in making judgments.

**(7) Time spent on outdoor activities during leisure time per day**

This referred to the average time spent on outdoor per day within the past half year. It included time spent on playing games, exercising or sports activities.

**(8) Time spent on watching TV, video or playing video games**

Refer to 3.2.1 (14) in Appendix 2 in the information of young children.

**(9) Hobby classes**

Refer to 3.2.1 (12) in Appendix 2 in the information of young children.

**(10) Type of sports frequently participated**

A multiple choice question which referred to the students' participation in extracurricular sports activities within the past half year. If subjects selected ball games, the type of ball game participated most should be chosen. In addition, subjects also needed to fill in the average duration spent per time on sports and how they felt afterwards.

**(11) Time for homework**

This referred to the average time spent on doing homework and revision at home each day.

**(12) Sleeping time**

Refer to 3.2.1 (9) in Appendix 2 in the information of young children.

**3.2.3. Questionnaire for Adults and Seniors**

Questionnaires for adults and seniors should be completed by the subjects themselves at the site. When questions arose while filling out the questionnaires, the subjects could ask the examiners immediately.

**(1) Birth place**

Refer to 3.2.1(2) in Appendix 2 in the information of young children's parents.

**(2) Community of residence**

Refer to 3.2.1 (2) in Appendix 2 in the information of young children.

**(3) Education level and occupation**

Refer to 3.2.1(5), (6) in Appendix 2 in the information of young children's parents.

**(4) Working environment and intensity of labour**

Adults should answer according to their current occupations. "Indoor jobs" referred to an indoor working environment and was further classified into naturally ventilated and air-conditioned.

Seniors should answer this question according to their current occupation or occupation before

retirement. Seniors would also choose from labour intensive or non-labour intensive.

**(5) Diseases experienced**

Refer to 3.2.1 (8) in Appendix 2 in the information of young children and 3.2.2 (2) in Appendix 2 in the information of children and adolescents (students).

**(6) Average working hours and sleeping hours per week**

Average working hours per week was the sum of average working hours per day. Average sleeping hours was calculated the same way (naps included). As a reminder, when choices were related to a range of time, the upper limit of the first choice was the lower limit of the second choice. For instance, (1) 20-35 hours (2) 35- 40 hours, subject should select the second choice when he/she reached the amount of 35 hours. The same applied to questions 9, 11, 12, 14, 16, 20, 21, and 22 in the questionnaire for adults, and questions 11, 13, 14, 16, 18, 22, 23, 24 in the questionnaire for seniors.

**(7) Quality of sleep**

"Poor" should be selected if the subjects felt asleep slowly, dreamt and suffered from insomnia frequently. "Good" was selected when subject felt asleep quickly, slept soundly and did not have insomnia. "Reasonable" was selected when the quality of sleep was between "good" and "poor".

**(8) Average walking time per day**

It included time walking to and from work, shopping and during work. Time walking less than 10 minutes each time or walking during sports activities would be excluded.

**(9) Average sitting time per day**

This included sitting time while working, reading, watching TV or entertaining and other activities that were mainly done by sitting but activities like cycling would be excluded.

**(10) Smoking and drinking**

Truthful information was required.

**(11) Activity during leisure time**

A multiple choice question. Choices like "chess and poker" referred to all kinds of chess, mahjong or poker. "Social gathering" referred to various types of gathering, dining or chatting with friends or relatives. "Traveling" referred to shopping, going to park or traveling. "AV entertainment" referred to watching TV, surfing internet, listening to radio or attending concert.

**(12) Sports events most frequently watched**

A multiple choice question. Subjects filled in the corresponding numbers in the blanks according to their most frequently watched sports events.

**(13) Sports activities**

Refer to 3.2.1(7) in Appendix 2 in the information of young children's parents. If subjects selected

“never”, then questions 21-27 could be skipped for adults and questions 23~28 could be skipped for seniors. If subjects selected "ball games", the type of ball games should also be selected.

Self-perception after sports activities was described by changes in breathing, heart rate and amount of perspiration.

**(14) Main obstacles for participating in physical exercise**

A multiple choice question. Subjects filled in the corresponding numbers in the blanks according to their actual conditions.

**(15) Understanding of "Physical Fitness Study"**

The Physical Fitness Study was a process that included testing, evaluating and giving advice with the goal of improving the physical fitness of Macao citizens. Subjects could answer the question according to their understanding of this study.

**4. Examined Indexes**

1. When recording examination data, examiner should remember that each blank was only for one Arabic number. If examination and recording were conducted by two different people, the examiner needed to loudly report the result and the recorder should loudly repeat the number. For example, when the examiner reported 168.5, the recorder should repeat 168.5 in order to ensure accuracy.

2. When recording results, all blanks before and after the decimal should be filled. If the result was a whole number, the blank after the decimal should be filled with a “0”. If there were three blanks before the decimal and the result was only two-digits, the first blank should be filled with “0”.

For instance: a subject’s height was 168.5 cm and weight was 59.0 kg, the blanks should be filled in like this:

height	1	6	8	.	5	(cm)
weight	0	5	9	.	0	(kg)

3. For sit and reach, the first blank should be “+” or “-”, representing a positive or negative result. Results should be filled from the second blank.

4. For walking on the balance beam, if the young child succeeded in moving forward on the beam, “1” was filled in the blank. If young child managed to move sideways on the beam, “2” was filled in the blank. If the young child failed to complete either, “3” was filled in the blank.

5. For successive jumps with both feet, if the young child failed to complete it, “99.9” was filled in the blank.

6. For 50 m x 8 shuttle run, 800 m run or 1000 m run, results should be recorded in seconds.

## Appendix 3 : Methods of Examining the Indexes of 2010 Physical Fitness Study of Macao SAR Citizens

“Skeletons of the whole body and the main bony landmarks” (figure 1) was used as reference for locating examination point.

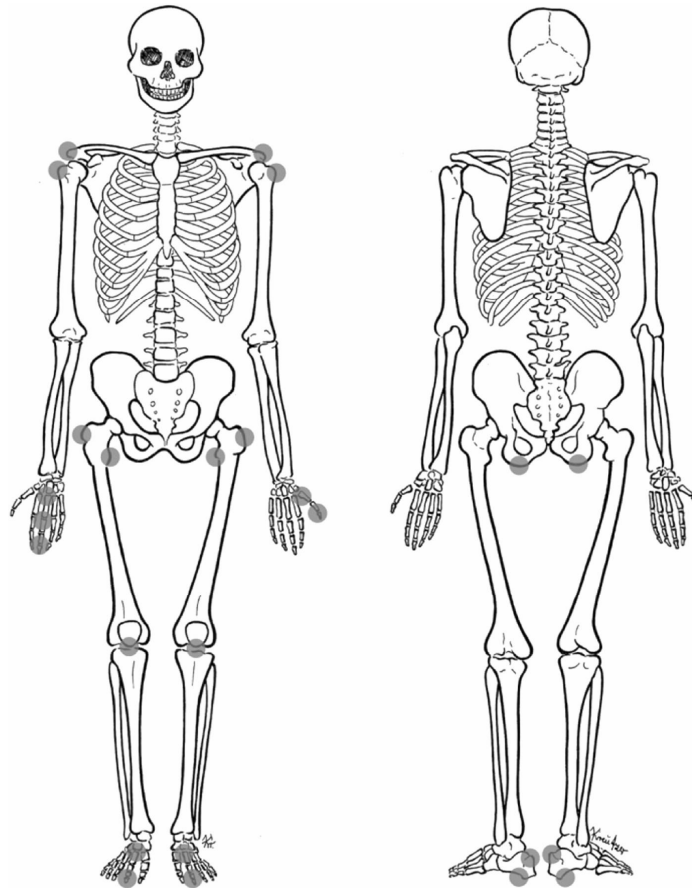


Figure 1 Skeleton of the Whole Body and the Main Bony Landmarks

### 1. Anthropometric Indexes

#### 1.1. Height

Apparatus: Stadiometer.

Methods: On bare feet, the examinee should stand upright, eyes looking straight (with upper part of ears and lowest part of eyes in a horizontal line), against the stadiometer. Upper limbs should be naturally down and both legs straight. Two heels should be kept together forming a 60° angle. Three points namely heels, coccyx and shoulders of the examinee should touch the vertical board, forming a straight line when standing (figure 2). The horizontal bar was slid down onto the examinee's head. The eyes of the examiner were kept at the same height as the horizontal bar when reading the scale. Measurement was done in centimeters, rounded to one decimal place.

Note:

- a) The stadiometer should be placed on a flat surface, against the wall.
- b) The examiner should hold onto the horizontal bar when moving it during testing.
- c) The requirements, "three points against the scale" and "two points horizontal" should be strictly adhered to.
- d) The tightness of the horizontal bar should be adjusted when placing it onto the examiner's head. If an examinee had frizzy hair, the hair should be pushed down when sliding the horizontal bar. Any accessories should be taken off and ponytails should be untied.
- e) When reading was completed, the horizontal bar should be slid up to a safe height to prevent accidents.



**Figure 2 Height**

## 1.2. Sitting Height

Apparatus: Stadiometer and stepping box

Methods: The examinee was to sit on seat with sacrum and shoulders touching the vertical board. The body and head was to keep straight and look horizontally to the front. The upper part of the ear and lower part of the eye should form a horizontal line (figure 3). The examiner was to stand at the right side of the examinee and slide the horizontal bar onto head top of the examinee. Recording should be done with the examiner's eyes on the same horizontal level as the horizontal bar. Measurement was done in centimeters, rounded to one decimal place.

Note:

- a) The examinee should bow first before sitting to ensure that the coccyx was closely against the scale. This way, the proper position would be guaranteed.
- b) Shorter children should choose a stepping box of proper height in order to prevent them from slipping forward during the examination.
- c) Other important points were the same as above.



**Figure 3 Sitting height**

### 1.3. Weight

Apparatus: Electronic digital scale.

Methods:

The scale was turned on and the button was pressed, showing a flickering signal on the screen. The scale was ready when the screen showed “0.0”. Wearing shorts, the examinee should stand naturally and balance the body at the center of the scale (figure 4). Weight of the examinee was recorded when the value on the screen stopped flickering. Recording was done using kilograms as the measuring unit and was rounded to one decimal place.

Note:

- a) During examination, the scale should be on a flat surface.
- b) The examinee should wear as little clothes as possible.
- c) The examinee should step on and off the scale slowly and softly.



**Figure 4 Weight**

### 1.4. Chest Circumference

Apparatus: Measuring tape.

Methods: Examinee should stand naturally and shoulders relaxed with both arms down naturally. Feet should be kept shoulder width apart and the examinee should breathe calmly.

The examiner should stand facing the examinee and wrapped the measuring tape around the examinee's chest from the scapular. For males and females before puberty, the lower part of the tape was placed on the nipples (figure 5). For females after puberty, the tape was placed on top of the nipples, parallel to the fourth rib. The examiner should keep the tape at a proper tightness to prevent the skin from showing an obvious mark. The value at which crossed with the “0” point of the tape was recorded. The value should be read when the examinee exhaled. Recording was done using centimeters as the measuring unit and was rounded to one decimal place.

Note:

- a) During examination, the examiner should pay attention to the status of the examinee. Wrong posture, ex. lowering of the head or shrugging the shoulders should be amended promptly.
- b) The examiner should control the tightness of the measuring tape properly.
- c) If the scapular was difficult to find, the examiner could ask the examinee to flex the chest. Only when the scapular could be clearly touched, the examinee could change back to the right posture.
- d) If the two sides of the scapular were not of the same height, the lower side should be used for measurement.



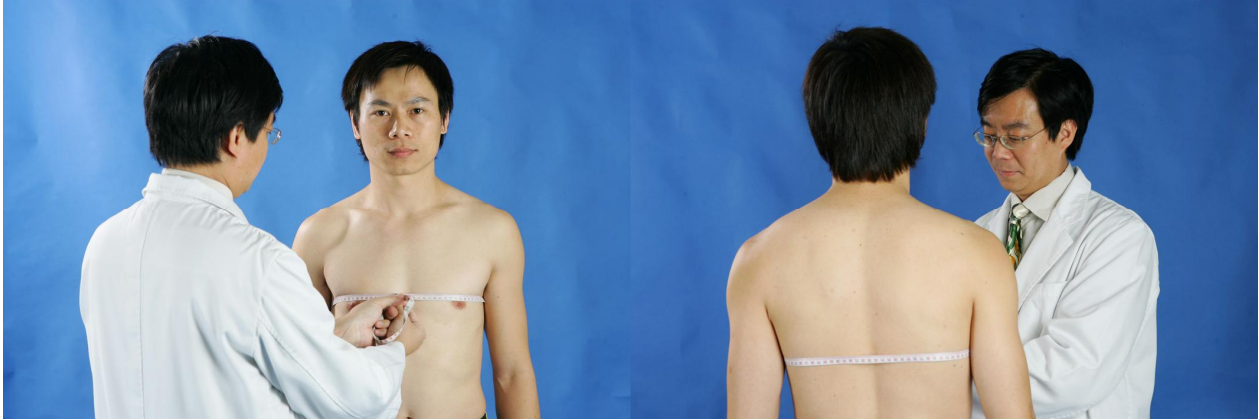


Figure 5 Chest circumference

### 1.5. Waist Circumference

Apparatus: Measuring tape.

Methods: Examinee should stand naturally and shoulders relaxed with two arms crossed before the chest. The examiner should stand facing the examinee and wrapped the tape around the examinee 0.5-1 cm point above the belly button (the thickest part of the waist should be measured for overweight examinees) (figure 6). The examiner should keep the tape at a proper tightness to prevent the skin from showing an obvious mark. The value at which crossed “0” point of the tape was recorded. Recording was done using centimeters as the measuring unit and was rounded to one decimal place.

Note:

- The examiner should control the tightness of the tape properly.
- During examination, the waist of the examinee should be fully exposed.
- During examination, the examinee should not consciously breathe in and out.

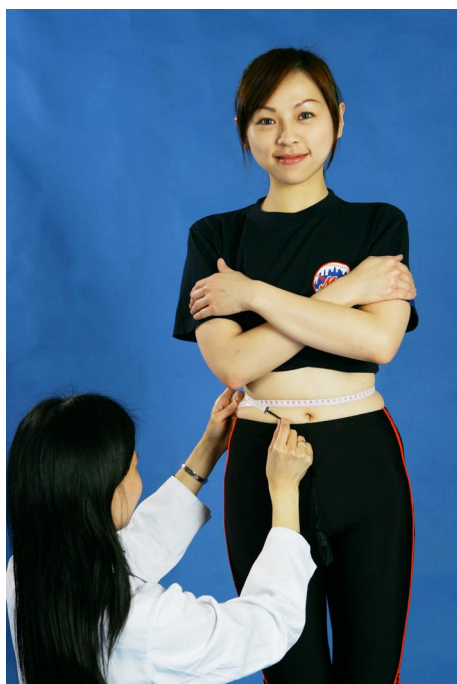


Figure 6 Waist circumference



Figure 7 Hip circumference

## 1.6. Hip Circumference

Apparatus: Measuring tape.

Methods: Examinee should stand naturally and shoulders relaxed with two arms crossed before the chest. The examiner should stand at the front and side of the examinee and wrapped the tape around the examinee along the peak of the gluteus maximums (figure 7). The examiner should keep the tape at a proper tightness to prevent the skin from showing an obvious mark. The value at which crossed the “0” point of the tape was recorded. Recording was done using centimeters as the measuring unit and was rounded to one decimal place.

Note:

- a) The examiner should control the tightness of the tape properly.
- b) During examination, males could only wear shorts and females could wear shorts, tank top or short sleeve shirt.
- c) During examination, the examinee should not consciously breathe in and out.

## 1.7. Skinfold Thickness

Apparatus: Skinfold caliper

Measuring sites: Upper arm, subscapular and abdominal skinfold.

Methods: The examinee should stand naturally and exposed the examined parts fully. The examiner should pinch the skin and hypodermis of the measuring sites with left thumb, index and middle fingers, and then measured the thickness 1 cm under the pinch point (figure 8). This examination should be done three times and the average value or the value of two same results should be recorded. Recording was done using centimeters as the measuring unit and was rounded to one decimal place.

Measuring site for upper arm skinfold thickness:

Grasp the fold of skin and subcutaneous adipose tissue at the midpoint between the shoulder and the elbow on the posterior surface of the right upper arm, with skinfold parallel to the length of the upper arm.

Measuring site for subscapular skinfold thickness:

Grasp the fold of skin and subcutaneous adipose tissue 1.0 cm below the right scapula, with skinfold form a line about 45° toward the spine.

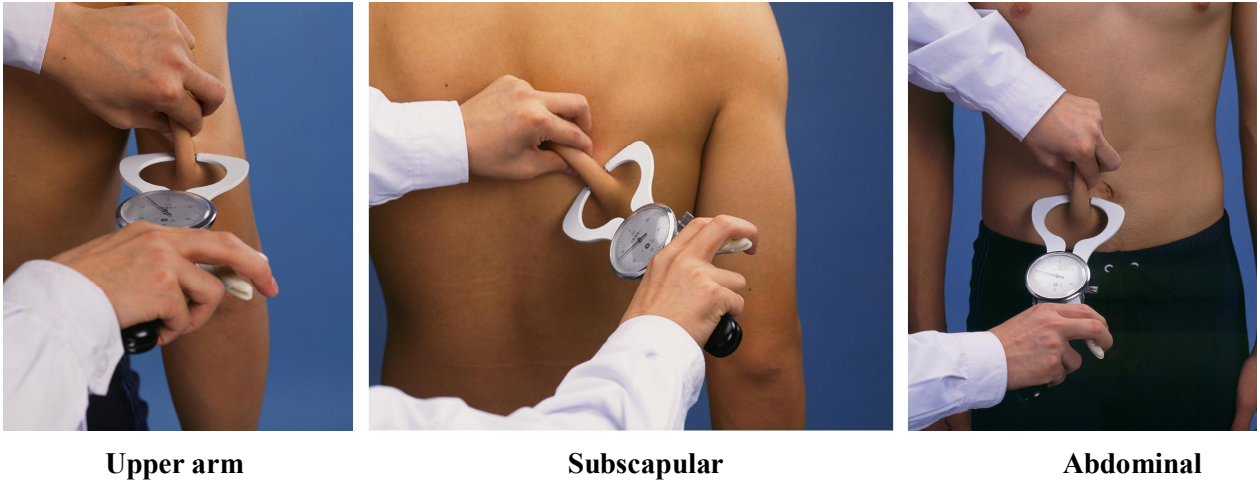
Measuring site for abdominal skinfold thickness:

Grasp the fold of skin and subcutaneous adipose tissue at the intersection point between the horizontal line of the navel and the right collar bone, with skinfold parallel to the long axis of the trunk.

Note:

- a) The examinee should stand naturally and muscle relaxed so that weight was naturally put on both legs.

- b) During examination, the examiner should pinch the skin and hypodermis together but not the muscle.
- b) During examination, the caliper should be perpendicular to the skin.
- d) During examination, the dial and pressure of the caliper should be adjusted frequently.



**Figure 8 Skinfold thickness**

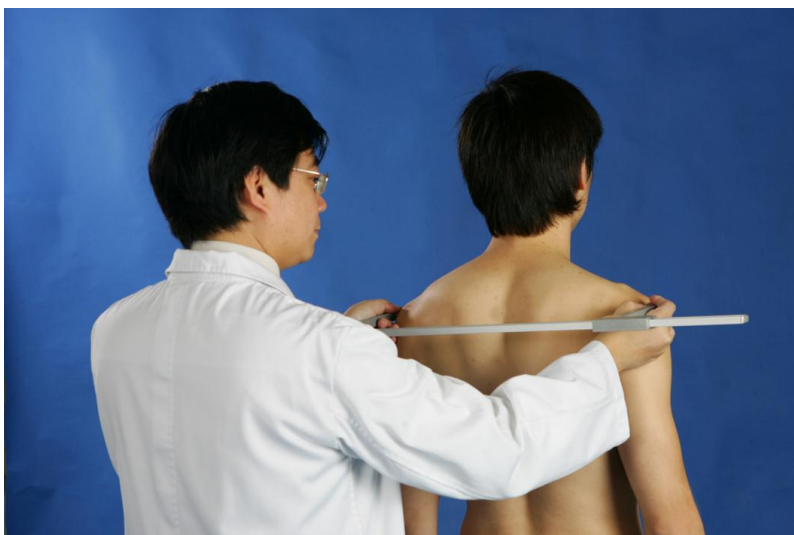
### 1.8. Shoulder Width

Apparatus: Bare L-square.

Methods: The examinee should stand naturally with shoulders relaxed and legs kept shoulder width apart. The examiner should stand behind the examinee and find the most convex part of the shoulders by feeling along the scapular area using both index fingers. This was the peak point of the shoulder. The distance between the two peak points of the shoulder was measured with the bare L-square (figure 9). Recording was done using centimeters as the measuring unit and was rounded to one decimal place.

Note:

- a) The examinee should relax both shoulders naturally, should not shrug or be nervous.
- b) The examiner should find the peak points precisely first and then adjusted the bare L-square.



**Figure 9 Shoulder width**

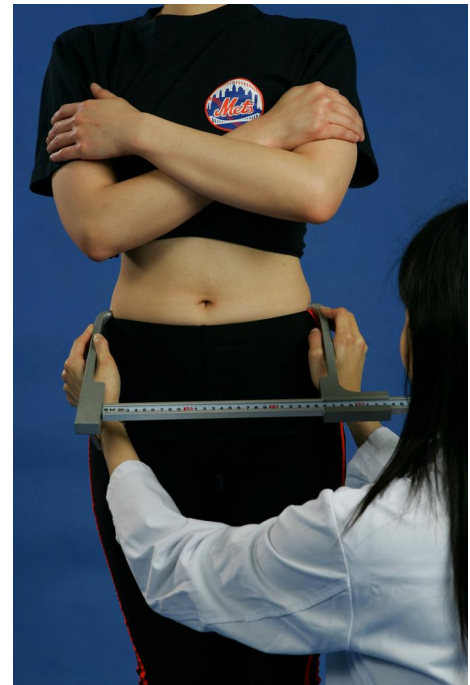
**1.9. Pelvis Width**

Apparatus: Bare L-square.

Methods: The examinee should stand naturally with both shoulders relaxed and legs shoulder width apart. The examiner should stand in front and side of the examinee and find the ileum point which was the widest part of the hip by using both index fingers (figure 10). Recording was done using centimeters as the measuring unit and was rounded to one decimal place.

Note:

- a) The examinee should not bow, bend legs or turn the body.
- b) The examiner should find the ileum point first and then adjusted the bare L-square.



**Figure 10 Pelvis width**

**1.10. Foot Length**

Apparatus: Foot length ruler

Methods: The examinee should stand naturally with bare right foot stepping on the ruler. The heel should be against the fixed board with the pelma touching the bottom of the ruler tightly and the outer part of foot closest to the side board of the ruler. The examiner should move the slipping board to the tip of the toe and measure the maximum length from heel to toe (figure 11). Recording was done using centimeters as the measuring unit and was rounded to one decimal place.

Note:

- a) During examination, the examinee should not bend the toes.
- b) The length of the foot should be parallel to the ruler.



**Figure 11 Foot length**

## 2. Physiological Function Indexes

### 2.1. Resting Pulse (Heart Rate)

Apparatus: Stopwatch and stethoscope.

Methods: The examinee should sit down placing the right forearm on the table with palm facing up. The examiner should sit at the right side of the examinee and measure the pulse of the examinee with ends of index finger, middle finger and ring finger. If the examinee was a child, the examinee should lie down and the examiner measured the heart rate with a stethoscope by placing it on the heart area (the intersecting point of the collar bone and the fifth rib bone) (figure 12).

Before examination, the examiner should make sure that the examinee was in a calm state. (That was, using 10 seconds as a unit, measured the pulse for three consecutive 10 seconds. If the value of two units was same and the difference with the third unit was less than one, it could be said that the examinee was in a calm state; otherwise, the examinee needed to rest until he met the requirement.) Then, measured the pulse for 30 seconds and doubled the figure to get the result. Recording used number of heart beats as the measuring unit.

Measurement of heart rate was the same as that of the pulse.

Note:

- a) The examinee should avoid strenuous exercise one or two hours before the examination.
- b) Adult and senior examinees should sit calmly for about 10 minutes before the examination.
- c) Examination for children could take place after their afternoon nap.



Figure 12 Resting pulse (Heart rate)

## 2.2. Blood Pressure

Apparatus: Sphygmomanometer and stethoscope.

Methods: The examinee should sit down placing the right arm naturally on the desk with palm faced up. The “0” point of sphygmomanometer should be roughly at the same vertical height as the heart and right arm of the examinee. The examiner should put on the inflation cuff properly with an appropriate tightness, exposing the elbow. The stethoscope was put on the brachial artery at the elbow. The stethoscope should not be pressed too hard or put under the cuff. The examiner should inflate the cuff raising the mercury column quickly till the arterial pulse was occluded, then further raise the mercury column to 20 to 30 mmHg. After that, the examiner should release the air slowly until the first pulse beat was clearly heard. This point was the systolic pressure. The examiner should release the air further till the clear and loud sound of a heart beat became vague and reverberating. This was the diastolic pressure (figure 13). Blood pressure should be measured in one trial; otherwise, a re-examination was needed. Recording for systolic pressure and diastolic pressure used mmHg as the measuring unit.

Note:

- a) The examinee should avoid strenuous exercise one to two hours before the examination.
- b) The examinee should sit for about 10 to 15 minutes to calm down before the examination.
- c) The examiner should check whether the mercury was at “0” point initially before the examination. If not, the examiner should adjust it. The examiner should also check whether there were bubbles in the mercury column and removed them if any. During examination, the sleeves of the shirt should not be tightly wrapped around the arm.
- d) The bottom of the inflation cuff should be 2.5 cm above the elbow.
- e) If a re-examination was needed, the examiner should wait until the mercury column dropped back down to “0”.
- f) If a re-examination was needed, the examinee should rest for about 10 to 15 minutes before beginning the re-examination. Professionals on site should pay attention to examinees with a high blood pressure reading.

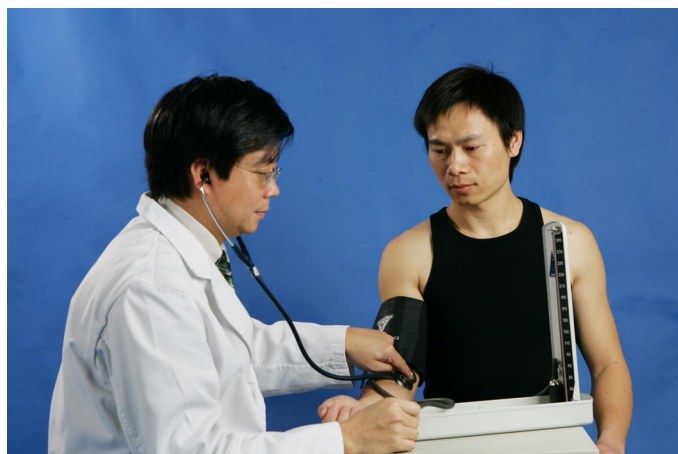


Figure 13 Blood pressure

### 2.3. Vital Capacity

Apparatus: Electronic Spirometer.

Methods: The examiner should turn on the switch and pressed the button. A flickering “8888” signal would show on the screen and when it stopped at “0”, it meant that the spirometer was ready.

The examiner should put a disposable mouthpiece in the air inlet and gave it to the examinee. The examinee should hold on to the tube and take a deep breathe with head leaning back a little. Then, the examinee should exhale forcefully into the mouthpiece (figure 14). The value shown on the screen was the vital capacity measurement. The examination should be done twice and the examiner should record the larger value using ml as the measuring unit and rounding it to the nearest whole number.

Note:

- a) During examination, a disposable mouthpiece should be used. If the mouthpiece had previously been used, it must be disinfected.
- b) Before examination, the examiner should explain the key points of the examination to the examinee and give a demonstration. The examinee could also try once.
- c) During examination, the examinee should not exhale too forcefully in order to prevent leaking of air from the mouthpiece. Also, the soft tube must be at the top of the inlet.
- d) No inhaling was allowed once the examinee started exhaling into the spirometer.
- e) The examiner should also correct the examinee if he breathed through the nose. If it could not be corrected, the examiner should ask the examinee to put on a nose clip or clipped the nose with his hands.
- f) Before the second examination, the examiner should press the button again to restore the spirometer to “0”.



Figure 14 Vital capacity

## 2.4. Step Test

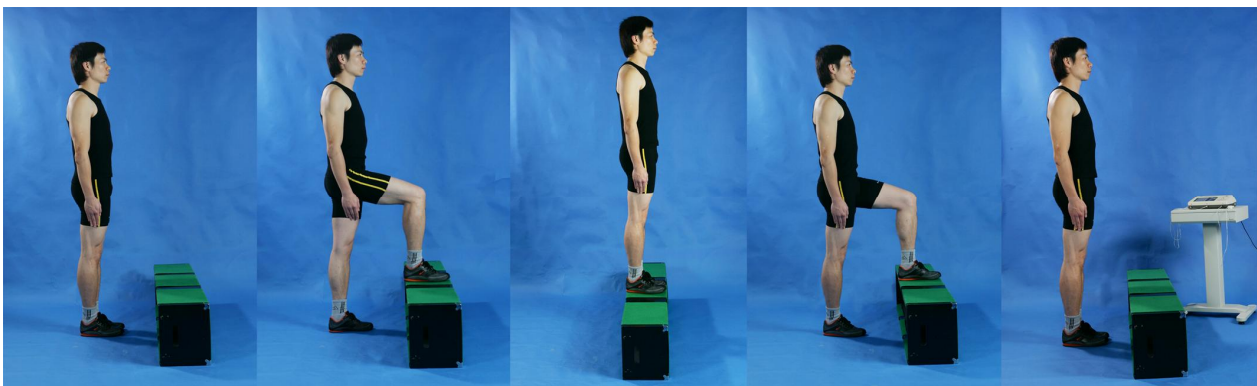
Apparatus: Steps (height of steps for males: 30 cm; height of steps for females: 25 cm), heart rate monitor, stopwatch (stand-by).

Methods: The examinee should stand in front of the steps and get ready for the test. The heart rate monitor was turned on and flickering signals was shown on the screen. Then, the button was pressed and the monitor was ready. After three loud beeps, the examinee should step up and down the steps according to the beat of the monitor.

The examinee stepped up with one foot on the first beep, and up with the other foot on the second beep; both legs should be straight when standing on the step. The examinee then stepped down with the first foot on the third beep followed by the other foot on the fourth beep. This would continue for 3 minutes (figure 15). A long beep signified the end and the examinee would stop, sit down with arm placed forward and palm facing up. The examinee's finger should relax and the finger sensor was clipped onto the tip of the index or middle finger.

The heart rate monitor examined the post-exercise pulse three times. After examination, the examiner should press the "function" button and record the duration of exercise. 30-second pulse figures after one minute, two minutes and three minutes post-exercise would be recorded.

During examination, if the examinee could not complete the exercise or could not step up and down the steps according to the beat, the examiner should stop the examinee from continuing, press the "function" button, put on the finger sensor and started the pulse recording procedures.



**Figure 15 Step test**

Note:

- a) Examinees with heart malfunction or heart disease should not participate in this examination.
- b) Examinees should avoid any vigorous exercise before the examination.
- c) When completely standing on the steps, both legs of the examinee must be straight and knees should not be bended.
- d) The examinee should step up and down according to the beats of the monitor.
- e) The examiner should also measure the pulse of the examinee manually and compare with the monitor. If a difference of 2 beats within 10 beats was detected, the monitor would be considered inaccurate and manual measuring should be used instead.
- f) Manual pulse measuring: measured the post-exercise pulse at three intervals – from one to one and a half minute, two to two and a half minute and three to three and a half minute after exercise.



### 3. Physical Fitness

#### 3.1. 10 Meters Shuttle Run (Young Children)

Apparatus: Several 10 meter lines were drawn on a flat ground (not limited to any type of ground), each line was 1.22 meters apart from each other. One side was the starting /finishing line, and the other side was the turning point. A line was drawn three meters from the starting/finishing line and an object was put at the turning point (wooden box or wall) (figure 16). A few stopwatches were also needed.

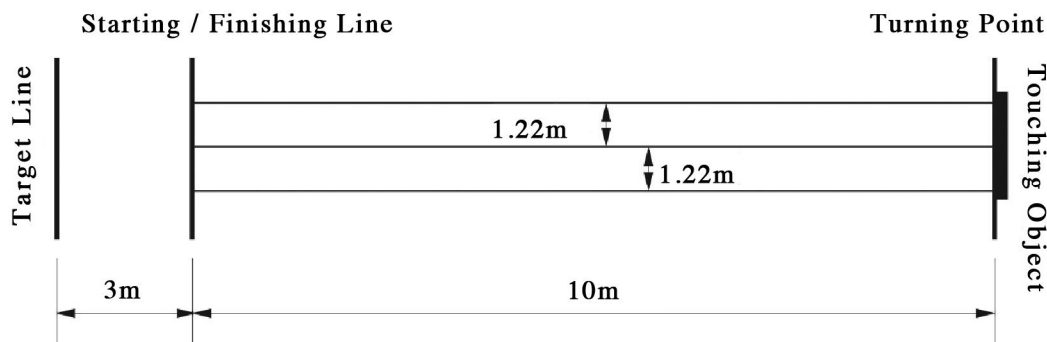


Figure 16 10 meters shuttle run track

Methods: At least two examinees stood as a group at the starting line with one leg forward and one leg back. On hearing the starting signal, the examinees should run immediately towards the turning point, touched the object (wooden box or wall) with hands and then turned back towards the target line (Figure 17). The examiner should stand on the side and at the front of the starting line to give instructions. The examiner started the stopwatch once the examinee began to run, ended when the examinee's chest passed through the finishing line. This examination would only be tested once. Recording was done using seconds as the measuring unit and rounded to one decimal place. The number after two decimal places was rounded up if it was not "0".

Note:

- Before examination, the examiner should explain clearly that the examinee was to run in a straight line at full speed towards the turning point, not onto other lines on the track.
- Before starting to run, the examinee should not step on or cross the starting line.
- When starting, if the examinee failed to hear the starting signal, the examiner could softly push the examinee to signal that he could start to run.
- The examinee could only slow down after passing through the starting/finishing line.
- At the target line, a specific person should be appointed to protect the examinees from falling down.



Figure 17 10 meters shuttle run

### 3.2. 50 Meters Run (Students)

Apparatus: Several 50 meters long lines were drawn on a flat ground (not limited to any types of ground), each line was 1.22 meters apart from each other. One side was the starting line and the other side was the finishing line (figure 18). A starting flag, whistle and stopwatches were needed.

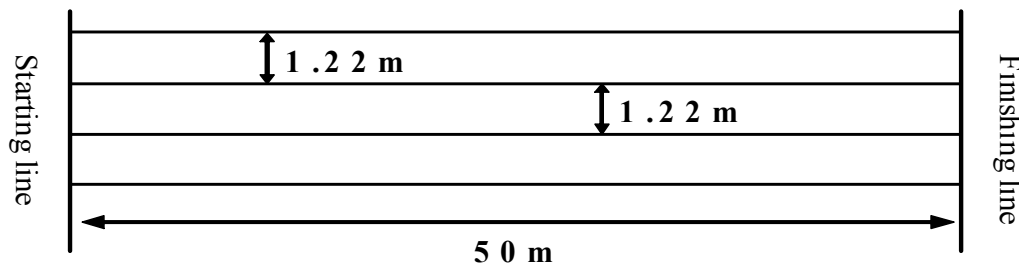


Figure 18 50 meters run track

Methods: At least two examinees were needed to form a group and waited to start at the starting line. On hearing the starting signal, the examinees began to run for the finishing line at full speed. The starter should stand on the side and at the front of the starting line, waved the flag while blowing the whistle. The timer at the finishing line started timing once the flag was waved (figure 19). Recording was done using seconds as the measuring unit and rounded to one decimal place. The number after two decimal places was rounded up if it was not “0”.

Note:

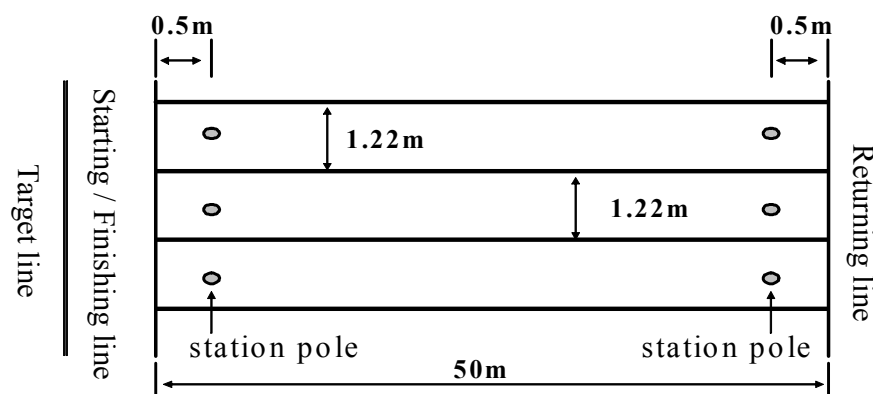
- Before examination, the examiner should explain clearly that the examinee was to run in a straight line at full speed towards the finishing line, not onto other lines on the track.
- Before starting to run, the examinee should not step on or cross the starting line. If any examinee began to run before the starting signal, the examiner should call the examinee back and restart.
- During examination, the examinee should wear sportswear and not spiked shoes.
- During examination, if there was wind, the examinee should run in the same direction as the wind.



Figure 19 50 meters run

### 3.3. 50 Meters x 8 Shuttle Run (Students)

Apparatus: Several 50 meters long lines were drawn on a flat ground (not limited to any type of ground), each line was 1.22 meters apart from each other. One side was the starting/finishing line and the other side was the returning line. A target line was drawn three meters away from the starting/finishing line and a 1.2 meters high station pole was put in the middle of the track about 0.5 meter away from the starting/finishing line and returning line (figure 20). A starting flag, whistle and stopwatches were needed.



**Figure 20 50 meters x 8 shuttle run track**

Methods: At least two examinees were needed to form a group and waited to start at the starting line. On hearing the starting signal, the examinees began to run for the returning line at full speed. A complete round was when the examinee reached the returning line, the examinee would run around the station pole in an anti-clockwise direction back to the starting/finishing line, then ran around the station pole in an anti-clockwise direction for the return line again; This shuttle run should go on for four rounds. When returning, the examinee should not touch the station poles or used the poles for balance. The starter should stand at the side of the starting/finishing line and began to time when the examinee started to run. The examiner should record the time when the examinee ran passed the finishing line (figure 21). This examination should only be done once using seconds as the measuring unit and rounded to one decimal place. The number after two decimal places was rounded up if it was not “0”.

Note:

- Before examination, the examiner should explain clearly that the examinee was to run in a straight line at full speed towards the turning point and not onto other lines on the track.
- Before starting to run, the examinee should not step on or cross the starting line. If any examinee began to run before the starting signal, the examiner should call the examinee back and restart.
- During examination, the examiner should report the number of rounds left to the examinee to prevent the examinee from running the wrong distance.
- During examination, the examinee should wear sportswear and not spiked shoes.
- The examinee could only slow down after passing the starting/finishing line.



Figure 21 50 meters x 8 shuttle run

### 3.4. 800 Meters Run (Females) or 1000 Meters Run (Males)

Apparatus: flat track, starting flag, whistle, stopwatches

Methods: At least two examinees were needed to form a group and waited to start at the starting line. On hearing the starting signal, the examinees began to run for the finishing line at full speed. The starter should stand at the side of the starting line and wave the starting flag while blowing the whistle. The timer should stand at the finishing line and began to time when the flag was waved. When the examinee completed the whole distance, the timer should stop timing (figure 22). The examination should only be done once. The examiner should record the completion time in seconds rounding to one decimal place. The number after two decimal places was rounded up if it was not “0”.

Note: Same as 50 meters x 8 shuttle run.

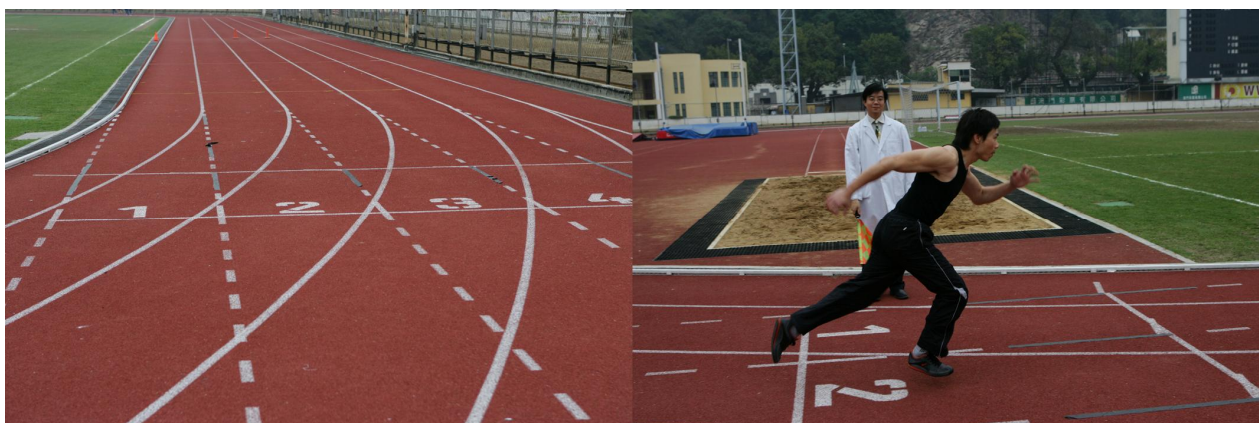


Figure 22 800 or 1000 meters run

### 3.5. Standing Long Jump

Apparatus: Electronic standing long jump mat.

Methods: The examiner should turn on the switch and pressed the button, a flickering signal would show on the screen. When the examinee stood at the starting line, the value on the screen should be “0” meaning that the apparatus was ready.

The examinee should select the starting line based on their capability. Legs of the examinee should be naturally apart when standing in front of the starting line. Arms were then waved back before jumping forward with full strength (figure 23). Three seconds after landing, the distance of the jump would be shown on the screen. The examinee should jump twice. The higher score was recorded using centimeter as the measuring unit and rounded to the nearest whole number.

Note:

- a) Before the examinee started to jump, he should not step on or crossed the starting line.
- b) If the instructions were not followed properly, the score would be invalid and the examinee needed to jump again until valid.
- c) When jumping, the examinee should not jump at the same spot several times, run up and jump, or jump continuously etc.
- d) Before each jump, the value shown on the screen must be “0” or else the button needed to be pressed to reset to “0”.

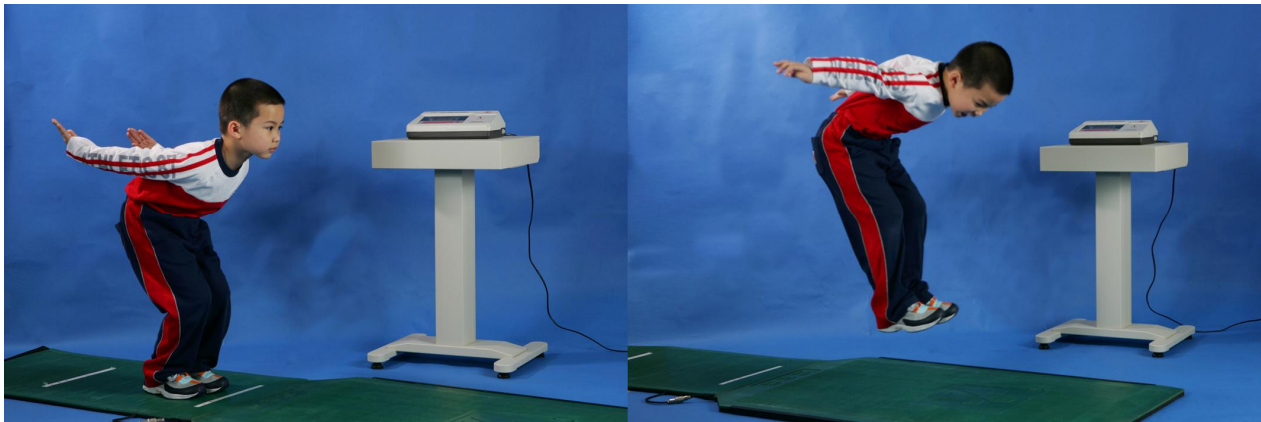
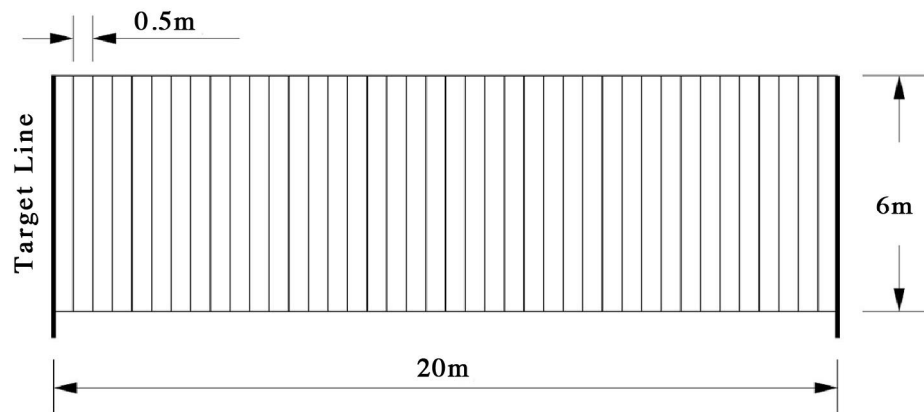


Figure 23 Standing long jump

### 3.6. Tennis Ball Distance Throw (Young Children)

Apparatus: A rectangle 20 meters long and 6 meter wide was drawn. One side of the rectangle was the throwing line and at every 0.5 meter from the throwing line, a straight line was drawn (figure 24). Rulers and standard tennis balls were needed.



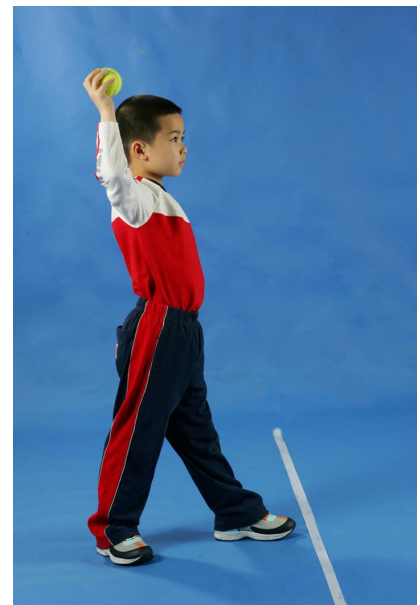
**Figure 24 Tennis ball distance throw field**

Methods: The examinee should stand behind the throwing line with one leg forward, one leg back, and tennis ball in one hand. The ball was thrown from behind the shoulder. When throwing the ball, the hind leg could move forward a step but could not step on or cross the throwing line (figure 25). An examiner would stand on the side and at the front of the throwing line to give instructions. Another examiner would observe the landing point of the ball and record the results. The test was done twice. The higher score was recorded using meters as the measuring unit and rounding to one decimal place.

Recording method: If the ball landed on a line, the value of the recording line was recorded. If the ball landed between two lines, then the value of the recording line closer to the ball was recorded. If the ball landed beyond 20 meters, the examiner should measure the length with a measuring tape. If the ball landed beyond 6 meters wide, the ball needed to be thrown again.

Note:

- During examination, the examiner should watch the landing point of the ball closely,
- The examinee should not step on or cross the throwing line when throwing the ball. Run and throw method was not allowed.



**Figure 25  
Tennis ball distance throw**

### 3.7. Walking on Balance Beam (Young Children)

Apparatus: A 30 centimeters high, 10 centimeters wide and 3 meters long balance beam was used. One end of the beam was the starting line and the other end was the finishing line. A 20 centimeters wide 20 centimeters long board served as platform was added at each end of the beam (figure 26).

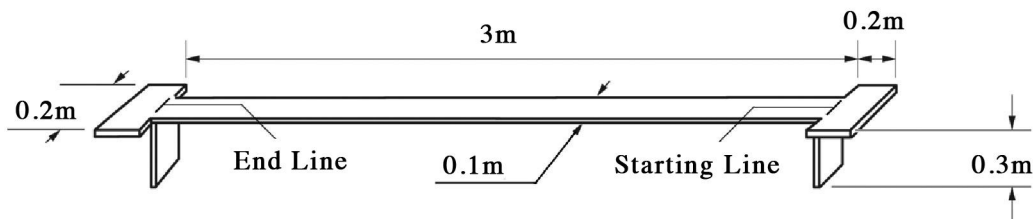


Figure 26 Balance beam

Methods: The examinee should stand on the platform at the starting end and face the beam with arms opened. When given the signal to “start”, the examinee should walk towards the finishing line by alternating both feet (figure 27). The examiner should stand in front and at the side of the examinee to give instructions, begin to time once the examinee started to move and follow the movement of the examinee. At the same time, the examiner should watch closely the movement of the examinee to avoid any accidents. When the toes of the examinee crossed the finishing line, the examiner should stop timing. The examination was done twice. The higher score was recorded using seconds as the measuring unit and rounding to one decimal place. The number after two decimal places was rounded up if it was not “0”.

Completion format: If the examinee finished the examination with two feet moving forward alternately, “1” was recorded. If the examinee finished the examination by moving sideways, “2” was recorded. If the examinee failed to complete the task, “3” was recorded.

Note:

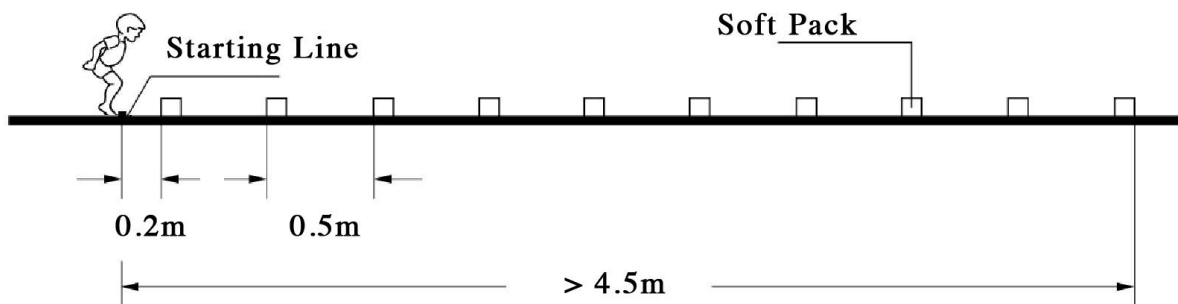
- Before examination, the toes of the examinee should not cross the starting line.
- If the examinee fell while walking, a second trial was needed.
- The examiner should pay close attention and protect the examinee.



Figure 27 Walking on balance beam

### 3.8. Successive Jumps with Both Feet (Young Children)

Apparatus: Measuring tape, stopwatch, ten soft packs (each 10 centimeters long, 5 centimeters wide and 5 centimeters high). A soft pack was put at every 50 centimeters in a straight line on a flat ground (figure 28).



**Figure 28** Successive jumps with both feet

Methods: The examinee should stand behind the starting line with both feet together and started jumping continuously with both feet together once the “start” signal was heard. Jumping stopped when the examinee reached the tenth soft pack (figure 29). At the same time, the examiner should begin to time and stop timing when the examinee finished jumping over the tenth pack and landing on both feet. The examinee should do this exam twice. The higher score was recorded using seconds as the measuring unit and rounding to the nearest decimal point. The number after two decimal places was rounded up if it was not “0”.

Note:

a) If the examinee jumped way over the soft packs, jumped on the soft packs, kicked away the packs while jumping or jumped with both feet alternately etc., the examination should be stopped and restarted.

b) If the examinee could not jump over the soft packs with one jump, two jumps were also accepted.



**Figure 29**  
Successive jumps with both feet



### 3.9. Sit-and-Reach

Apparatus: Electronic sit-and-reach apparatus

Methods: The examiner should turn on the apparatus and move the nonius to the near end of the track. When “-20.0 centimeter” or below was shown on the screen, it meant that the apparatus was ready.

Facing the apparatus, the examinee sat on a mat with legs stretched forward and heels together, feet flat against the apparatus and toes naturally apart. The examiner should adjust the height of the track so that the tip of the examinee’s toes was right below the nonius. During examination, the hands of the examinee should be together, palms face down, knees straight and reach as far as possible pushing the nonius with fingertips (figure 30). A value would show on the screen. The examination was done twice. The higher score was recorded in centimeters and rounded to one decimal place.

Note:

- a) Before examination, the examinee should do warm-up exercise.
- b) During examination, the examinee’s arms should not move suddenly, push the nonius with one hand or bend the knees.
- c) Before each examination, the examiner should move the nonius back to the near end of the track,
- d) The examiner should record the examinee’s score properly.
- e) If the score of the examinee was less than “-20.0 centimeter”, it should be recorded as “-20.0 centimeter”.



Figure 30 Sit and reach

### 3.10. Pull-ups with Body Inclined (Males)

Apparatus: One short adjustable single bar or several short single bars of different height. The diameter of the bar should be based on whether the examinee could grasp it or not.

Methods: The examiner should adjust or select a proper single bar and make sure that the bar was as high as the chest (nipples) of the examinee. Facing the single bar, the examinee should stand naturally with hands apart at shoulder width, grasp the bar and stretch both legs with heels touching the mat. A partner should anchor the feet of the examinee to make sure that the two arms of the examinee were perpendicular to the body and the body was slanting backwards. A complete pull-up would be bending the arms, pulling the chin to touch or exceed the bar and completed with arms unbent to the starting position (figure 31). The examiner should count and record the number of pull-ups the examinee completed.

Note:

a) When doing a pull-up, the body should be straight without bending the waist or relaxing the abdomen. If the examinee did a pull-up with the help of moving his feet, bending waist, relaxing the abdomen or the chin failed to reach the bar, the pull-up would not be counted.

b) After the examinee did a pull-up, he must return to the starting position.

c) Mats could be put under the single bar and the examiner could stand at the side behind the examinee in case protection was needed.



Figure 31 Pull-ups with body inclined

### 3.11. Pull-ups (Males)

Apparatus: Several high single bars. The diameter of the bar should be based on whether the examinee could grasp the bar or not.

Methods: Facing the single bar, the examinee should stand naturally, wave the arms backwards, jump and grasp the bar with two hands shoulder width apart. When the body stopped swaying, the examinee should pull the body upwards using full arm strength and without additional movements of the body. One complete pull-up would be when the chin was above the bar and the examinee returned to the starting position (figure 32). The examiner counted and recorded the number of pull-ups done by the examinee.

Note:

a) The examiner could assist the examinee if he was relatively short and could not grasp the bar by himself even after jumping.

b) During examination, the examinee should keep the body straight without bending the knees or relaxing the abdomen. If the examinee did a pull-up with the help of moving his feet, bending waist or relaxing the abdomen, the pull-up would not be counted.

c) During examination, safety gears should be available to prevent any accidents.



Figure 32 Pull-ups

### 3.12. Vertical Jump

Apparatus: Vertical jump test mat

Methods: The examiner should turn on the switch and press the button. A flickering signal on the screen and a loud beep meant that the mat was ready. The examinee should step on the mat with legs naturally apart and get ready for the jump. When “0.0” was shown on the screen, the examination could begin. The examinee should squat with bended knees, wave the arms backwards and jump upwards vertically with full strength (figure 33). When the examinee landed back on the mat, the figure shown on the screen was the result of the examination. The examinee should jump twice. The higher score was recorded using centimeters as the measuring unit and rounding it to one decimal point.

Note:

- a) When jumping, legs of the examinee should not move and the examinee could not jump several times on the spot.
- b) From jumping to landing, the examinee could not bend the hip or knees.
- c) If the examinee failed to land back on the mat, the jump was not counted and the examinee should try a second time.
- d) Before each jump, the examiner should wait for the mat to go back to “0” automatically or press the button to reset the value to “0”.



Figure 33 Vertical jump

### 3.13. Grip Strength

Apparatus: Grip dynamometer

Method: Before examination, the examinee should grasp the dynamometer with their stronger hand and adjust the grip of the dynamometer with the other hand until it felt comfortable. The examiner should turn on the dynamometer and a flickering signal would appear on the screen. When “0.0” was shown, the dynamometer was ready. During examination, the examinee should stand still with legs shoulder width apart, arms down, palms inward and grip the dynamometer with full strength (figure 34). The examinee should do the examination twice. The higher score was recorded using kilograms as the measuring unit and rounding it to one decimal place.

Note:

- a) During examination, the examinee should not move the arms, bend knees or hold the dynamometer against the body.
- b) If the examinee could not determine which hand was stronger, each hand could be examined twice and the highest scores would be recorded.
- c) Before each examination, the examiner should press the button to reset the value to “0”.

### 3.14. Back Strength

Apparatus: Back dynamometer

Methods: The examiner should turn on the dynamometer and press the button. A flickering signal would appear on the screen and a “0” meant that the dynamometer was ready.

The examinee should stand on the back dynamometer with feet about 15 centimeters apart, arms down in front of the legs. The examiner would measure the chain so that it barely touched the fingertips of the examinee. This length of the chain would be hooked onto the dynamometer. During examination, the examinee should stretch both arms, grip the handle, legs stretched and head upwards; use the back and pull with full strength (figure 35). The examinee should do this twice and the higher score was recorded by the examiner using kilograms as the measuring unit. The number after the decimal point would



Figure 34 Grip strength

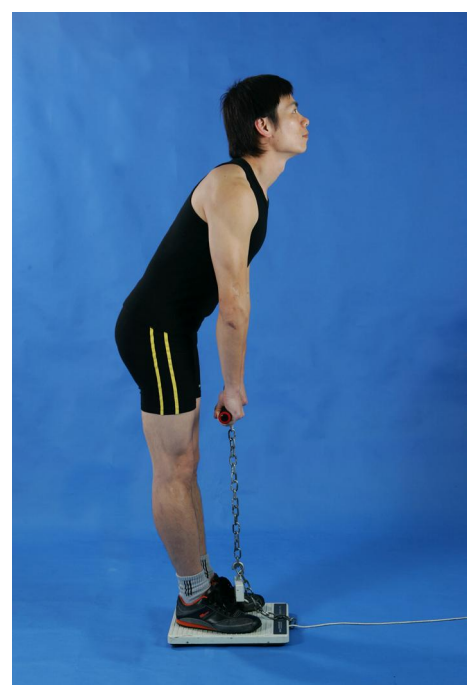


Figure 35 Back strength

be discarded.

Note:

- a) Before examination, the examinee should do warm-up exercise.
- b) During examination, elbows and knees should be straight.
- c) Before each examination, the examiner should press the button and reset the value to “0”.

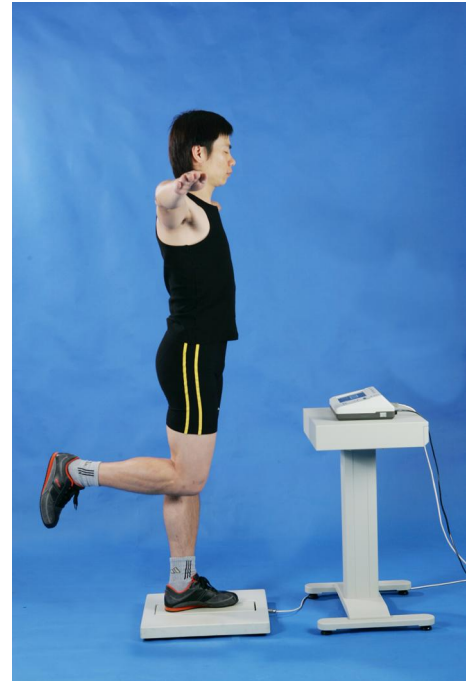
### 3.15. One-foot Stands with Eyes Closed

Apparatus: Balance monitor

Methods: The examiner should turn on the switch and press the button. A flickering signal on the screen followed by a loud beep meant that the monitor was ready. The examinee would step on the sensor board with both feet, the stronger foot on the pressure sensor in the middle. A value of “0” would appear on the screen followed by a loud beep. Then the examinee would close his eyes and raise the foot that was not on the sensor (figure 36). The loud beep would stop and the monitor would start counting the time as soon as the other foot was off the board. When the supporting foot of the examinee moved or the raised foot touched the board, a beep would sound signifying end of the examination. The value shown on the screen was the length of balancing act in seconds. The examinee should do the examination twice and the higher score would be recorded by the examiner. The number after the decimal point would be discarded.

Note:

- a) Before examination, the examinee should step on the board with both feet. The examination would begin only when the examinee stood still.
- b) During examination, eyes should be closed.
- c) The examiner should pay attention and protect the examinee.
- d) Before each examination, the examiner should wait for the monitor to go back to “0” automatically or press the button to reset the value to “0”.



**Figure 36**  
**One-foot stands with eyes closed**

### 3.16. Respond Time

Apparatus: Electronic selective respond time apparatus

Methods: The examiner should turn on the apparatus and “FYS” would appear on the screen meaning that the apparatus was ready. When examination began, fingers should be placed straight together with the middle finger pressing the “start” button. When a random “signal” light illuminated together with a beep sound, the same hand should press the corresponding button as fast as possible, return to the “start” button and wait for the next signal. There would be five signals in total for each trial (figure 37). When a continuous beeping sound appeared and all signal lights were lit, the examination was completed and the respond time would show on the screen. This examination was done twice and the faster respond time was recorded and rounded to two decimal points.

Note:

- a) During examination, the examinee should not slam the signal buttons.
- b) The examinee should press the “start” button at all times until a beep was heard or a light was lit. Otherwise, the examination could not be carried out smoothly.
- c) The “start” button should be pressed to begin the next examination.

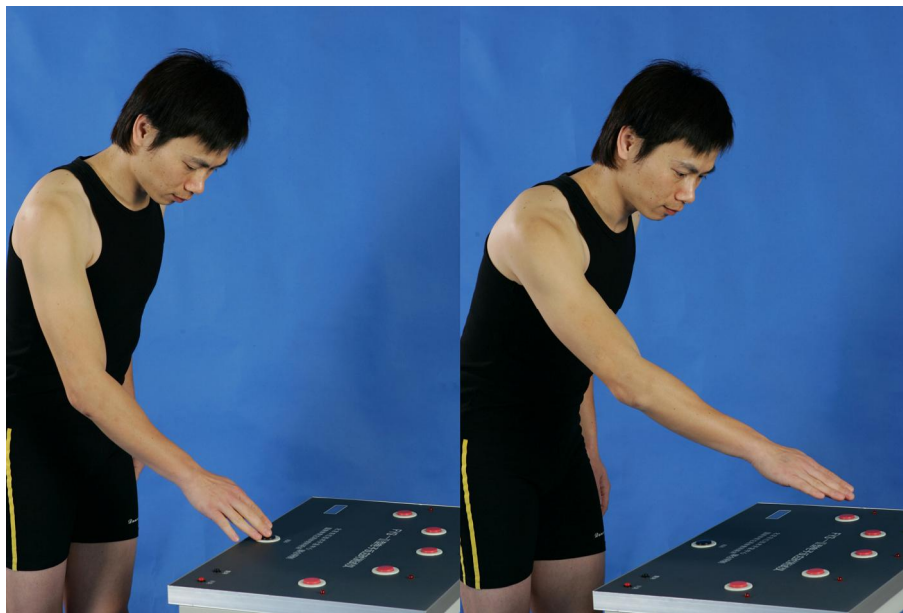


Figure 37 Respond time

### 3.17. Push-ups (Males)

Apparatus: Electronic push-up counter.

Methods: Before examination, the examinee should stretch out both arms at shoulder width apart. The examinee would then lie on the testing board faced down, hands on the board and legs stretched back. The examiner should adjust the height of the infrared receiver and reflector to make sure that it could sense the examinee's 'up and down' push-up movements. Afterwards, the examiner should turn on the switch and a "0" would show on the screen, meaning that the counter was ready. At this time, the examiner should press the red button on the testing board. On hearing a loud beep, the examinee should bend both arms to lower the body to the same level as the shoulders and elbows. Next, the examinee should push the body up and return to the starting position. This movement was counted as one push-up (figure 38). The examinee should repeat this movement continuously. When it took more than five seconds to complete one push-up or a position was freeze for more than 3 seconds, the apparatus would stop automatically. The number of push-ups done would be recorded.

Note:

- a) During examination, if the examinee failed to keep the body stretched or lower the body to the same height as the shoulders and elbows, it would not be counted as a push-up.
- b) The red button was pressed to begin the next examination.

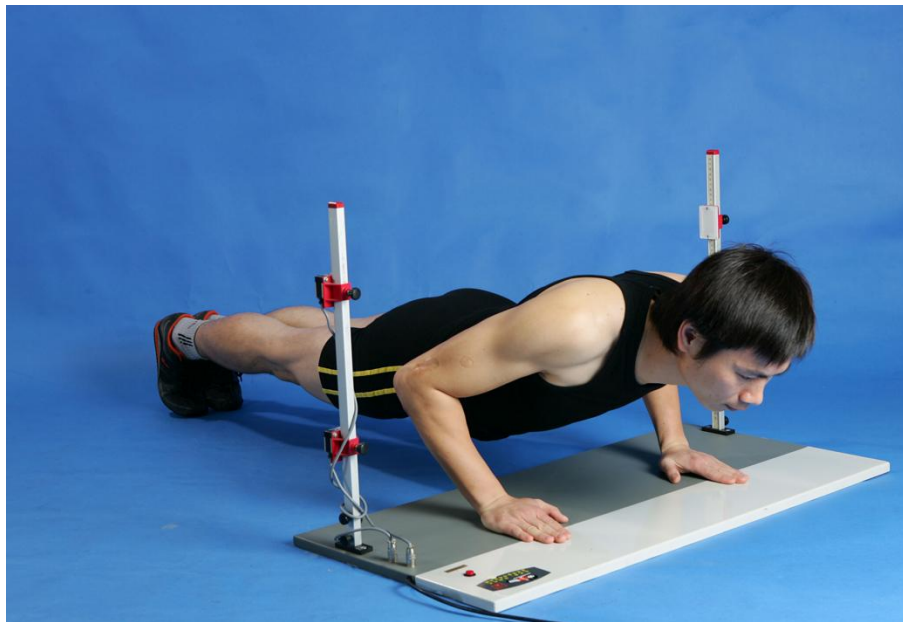


Figure 38 Push-ups



### 3.18. One-Minute Sit-ups (Females)

Apparatus: Electronic sit-up counter.

Methods: Before examination, the examinee should put both hands behind the head with fingers crossed, legs spread and feet tied onto the testing board. The examiner should adjust the knee-supporting frame and feet board so that the examinee could bend the knees at a proper angle. The height of the infrared receiver and reflector was adjusted to make sure that it could sense a sit-up. The examiner should turn on the switch and a “0” would show on the screen meaning that the counter was ready. Next, the examiner should remove the knee-supporting frame and pressed the red “start” button on the testing board. On hearing a loud beep, with arms still behind the head, the examinee should flex up, elbows touch or exceed the knees, return to the starting position and this would be counted as one sit-up (figure 39). The examinee should do as many sit-ups as possible in one minute. The examination was over with a loud ending beep. The number of sit-ups done would be recorded.

Note:

- a) During examination, if the examinee did a sit-up with the help of elbow strength or used hip motions, or if the elbows failed to touch or exceed the knees, it would not be counted as a sit-up.
- b) During examination, the examiner should report to the examinee the number of sit-ups done.
- c) The red button was pressed to begin the next examination.

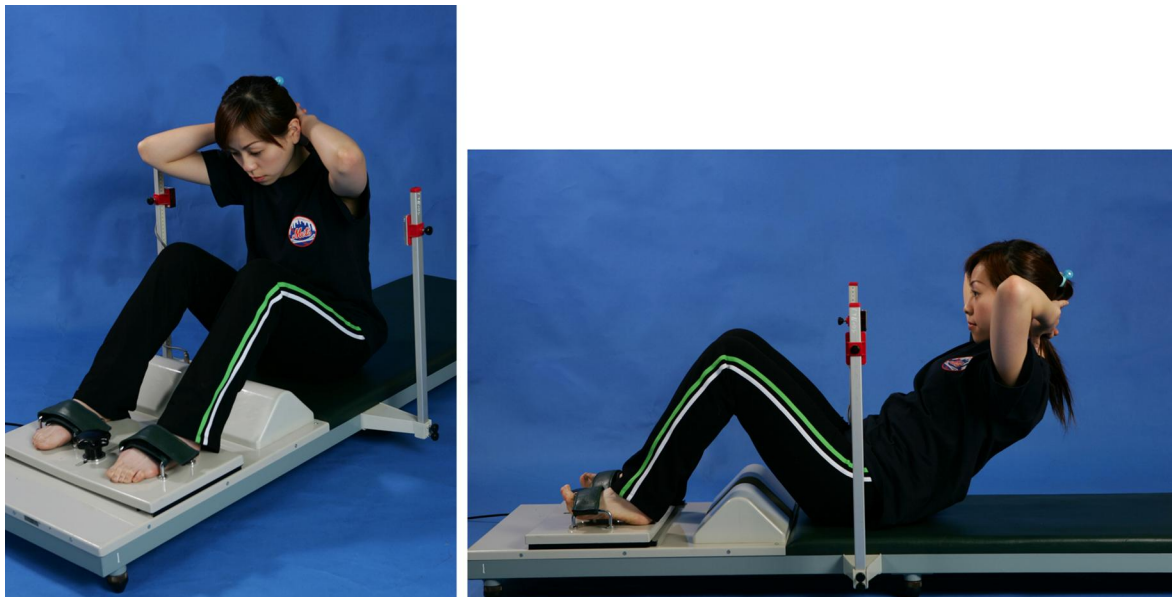


Figure 39 One-minute sit-ups

## 4. Health Indexes

### 4.1. Tooth Decay

Apparatus: Mirror, #5 probe needle.

Methods: Teeth were examined one by one in a quadrant order. Pits, holes and easily decayed areas between the teeth should be thoroughly checked with a probe needle. Diagnosis could only be determined after the check-up.

Judgment Standard:

a) No tooth decay: no existing fillings and no fillings needed.

b) Tooth Decay: discoloration, form and quality changes between the teeth. Form and quality changes would be the main evidence of diagnosis. "Form changes" was indicated by destruction of the enamel. If softening could be felt at the bottom of the hole when picking with the probe needle, it was known as "quality" change. If there were white spots or other color spots on the enamel and if there was no softening of a hole when picked with a probe needle, these would not be diagnosed as teeth decay. Decay of primary teeth was marked as "d", and decay of permanent teeth was marked as "D".

c) Teeth loss due to decay: Loss of primary teeth not due to eruption of permanent teeth was marked by "m". Permanent teeth taken out due to decay were marked by "M". During diagnosis, the examiner should pay attention to loss of teeth not due to decay but to physiological replacement.

d) For existing filled teeth, primary teeth that had no continuous tooth decay (filling was not intact with the decayed part of teeth) and no neighbouring tooth decay were marked by "f", permanent teeth were marked by "F".

e) Existing filled teeth but continued to have tooth decay or have neighbouring tooth decay were regarded as decayed teeth.

Recording methods: The teeth quadrant chart was filled after diagnosis using d, D, m, M, f, F in the relevant blanks.

(1) There were 16 blanks in the teeth quadrant chart representing "upper" teeth and "lower" teeth respectively. For decayed teeth, the examiner was required to fill in respective letter into the blanks according to the teeth position and types of decay (i.e. primary teeth, permanent teeth etc).

(2) The blank after the teeth decay mark was for filling the total number of different types of teeth decayed. It should be recorded in Arabic numbers.

Note:

a) Examination must be done by professional dentists.

b) For filled teeth, attention must be paid to examinee whether there were new caries at the teeth surface and whether there was continuous decay below the filling and with neighbouring teeth.

c) One probe needle could only be used for 60 examinees (times) maximum.

d) After completion of examination with each examinee, all the tools used must be disinfected.

## 4.2. Eye Sight

Apparatus: Standard eye chart (figure 40). The height of eye chart was adjusted to make sure that line 5.0 of the eye chart was at the same height as the eyes of most of the examinees. Illuminance of the eye chart was about 500 lux.

Methods:

a) The examinee should stand 5 meters away from the eye chart and softly cover the left eye. The right eye was examined first, then the left eye. This was testing of the naked eye.

b) The examiner started from the optotypes at line 5.0. If the examinee could not identify clearly, the examiner continued with the line above 5.0 one by one. If the examinee could identify line 5.0 correctly, the examiner continued with the line below line 5.0 one by one. The examinee was required to identify the optotypes within 5 seconds. The examinee could not make mistakes from line 4.0 to line 4.5. The examinee could only make two mistakes from line 4.6 to line 5.0 and could only make three mistakes from line 5.1 line to line 5.3. If the examinee made more mistakes than the above requirements in one line, that line was the examinee’s eyesight score.

c) If the examinee could not identify the first line of the visual chart from 5 meters away, the examinee should stand 2.5 meters away or 1 meter away; 0.3 and 0.7 were subtracted respectively from the score as the final eyesight score (figure 41).

For example: If the examinee could not identify the first line of the visual chart from 5 meters away, the examiner could ask the examinee to stand 2.5 meters away. At that distance, the score of the examinee was 4.2, thus the final score of the examinee was  $4.2 - 0.3 = 3.9$ .

Another example: If the examinee still could not identify the first line of the eye chart from 2.5 meters away, the examiner could ask the examinee to stand 1 meter away. At this distance the score of the examinee was 4.2, thus the final score of the examinee was  $4.2 - 0.7 = 3.5$ .

d) If the naked eyesight of the examinee was above or equal to 5.0, “Normal=0” was recorded into the blank which meant that the eyesight of the examinee was normal and there was no need to correct vision with glasses.

e) If the naked eyesight was below 5.0, it meant that the examinee had poor eyesight. If the range was from 4.8 to 5.0, it was considered mild, 4.6 to 4.8 was considered moderate, and 4.5 to below 4.5 was severe. For near-sighted examinees, glasses should be used to correct vision.

f) Recording methods: Filled the score for both left and right eyes of the examinee in relevant blanks.

For example, if the score of naked eyesight was 5.0 for left eye and 4.6 for right eye, then the examiner should fill in the left blank with 

5	0
---	---

, and right blank with 

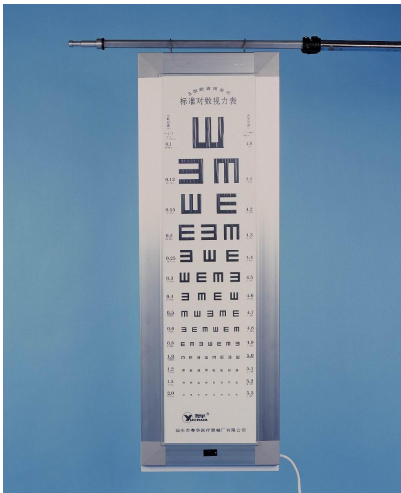
4	6
---	---

.

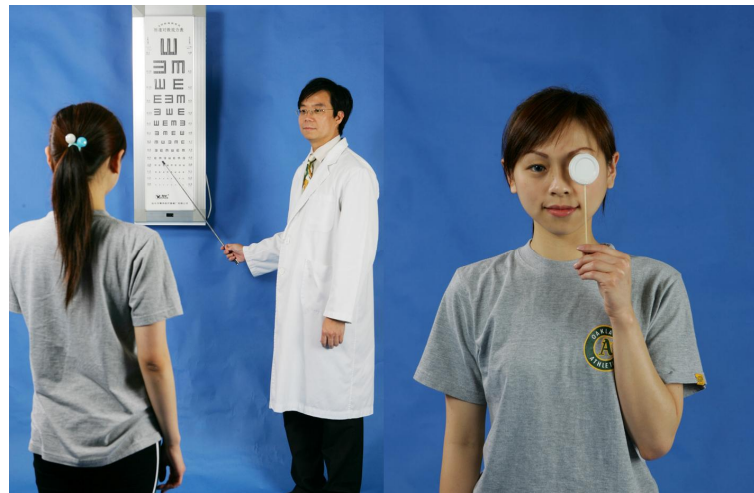
g) Adjustment of string mirror and recording methods of refractive errors: ↓represented decreased eyesight, ↑represented improved eyesight and “0” represented no change in eyesight. Put the result on the corresponding places for left and right eyes. “0” represented normal, “1” represented near sighted, “2” represented far sighted, “3” represented others.

For example, poor eyesight was detected in subject A. After string mirror assessment, positive mirror eyesight of the right eye was decreased while negative mirror eyesight improved; the examiner had to put ↓ on the space for positive mirror and ↑ on the space for negative mirror. Since the left and right eyes were assessed as “near sighted”, so “1” would be put on the spaces for the left and right refractive errors.

For example, poor eyesight was detected in subject B. After string mirror assessment, positive mirror eyesight of the left eye improved while negative mirror eyesight decreased, ‘far sighted’ of the left eye was then diagnosed. No change was detected in the positive and negative mirror eyesight of the right eye, “others” would be stated. Therefore, ↑ was put on the space for positive mirror and ↓ was put on the space for negative mirror of the string mirror adjustment part. On the right space, “0” was put on the space for both positive and negative mirror. “2” and “3” were put on the left and right space respectively of the refractive errors part.



**Figure 40** Standard eye chart



**Figure 41** Eye sight

Note:

a) Before eyesight examination, the examiner should explain the purpose, significance, and methods of examination to the examinee to gain their cooperation and to examine their naked eye sight.

b) If natural light was used for the examination, the examiner should choose a sunny day, a specific time and location so that comparison of results would be easier in the future.

c) Before examination, the examinee should not rub the eyes. During examination, the examinee should not narrow the eyes. The examiner should be supervising at all times.

d) When using the eye board, the examiner should remind the examinee not to press hard on the eye ball to prevent affecting the eyesight.

e) The examination team would assign professionals to examine eyesight.

f) It was not proper to examine the eye sight after tense work, strenuous exercise or heavy physical labour. At least 10 minutes rest was needed before the examination. If the examination was carried out indoor, the examinee should take 10 minutes to adapt to the environment after entering the room.

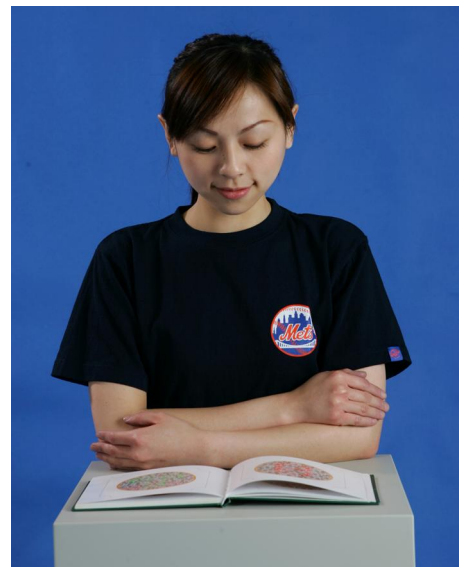
### 4.3. Color-Vision Deficiency Examination

Apparatus: Color Vision Examination Chart Second Edition (People Health Publishing House, edited by Wang Kechang, 2004) (figure 42).

Methods: The chart should be opened under bright natural light (Sunlight should not shine directly on the pictures) or under lamp light. The examinee should sit at a 40 to 80 centimeters distance between the eyes and the pictures. The examiner should pick the first picture as an example to teach the examinee the correct way to do the examination, then the examiner would pick 3 pictures at random from picture 2 to picture 8 for the examination (figure 43). If the examinee passed the examination, the color vision of the examinee was normal; otherwise, it was abnormal. The examiner should also record “normal” or “abnormal” accordingly. The code was 1 for “normal” and 2 for “abnormal”.



**Figure 42**  
**Color Vision Examination**



**Figure 43**  
**Color-Vision Deficiency Examination**

Note:

- a) Sunlight should not shine directly on the face of the examinee.
- b) After one examination, the examiner should close the chart immediately.
- c) When reading the pictures, the examinee should keep the pictures clean.
- d) Both the examiner and the examinee should not touch the picture with hands to prevent damage to the pictures. If necessary, a small stick can be used.
- e) It was not proper to examine the eyesight after long work hours, strenuous exercise and heavy physical labour. At least 10 minutes rest was needed before examination. The examinee should also have 10 minutes to adapt to the environment after entering the room.
- f) Before examination, the examinee should not rub the eyes. During examination, the examinee should not narrow the eyes or look at the sides. The examiner should be supervising at all times.

**Appendix 4 : Sampling Sites of 2010 Physical Fitness Study of Macao SAR Citizens**

Subjects	Kindergarten code number	Name of kindergarten	Community of main campus	
Young children (aged 3~6)	001	Keang Peng School (kindergarten)	Paróquia de Nossa Senhora de Fátima(North)	
	002	Hou Kong Middle School (affiliated kindergarten)		
	003	Pui Ching Middle School (kindergarten)	Paróquia de Santo António and Paróquia de S. Lázaro (Central)	
	004	Chan Sui Ki Perpetual Help College (branch school- kindergarten)		
	005	Pooi To Middle School (branch school of Praia Grande and Taipa branch school—kindergarten)	Paróquia da Sé Catedral	(South)
	006	Estrela do Mar School (kindergarten)	Paróquia de S. Lourenço	

Subjects	School/ university Code number	Name of school/ university	Community of main campus	
Children and Adolescents (Students) (aged 6~22)	021	Keang Peng School (including primary school and secondary school)	Paróquia de Nossa Senhora de Fátima (North)	
	022	Hou Kong Middle School (including primary school and branch school in Taipa)		
	023	Pui Ching Middle School	Paróquia de S. Lázaro (Central)	
	024	Chan Sui Ki Perpetual Help College		
	025	Pooi To Middle School (including branch school of Praia Grande and primary school section)	Paróquia da Sé Catedral	(South)
	026	Estrela do Mar School (including branch school)	Paróquia de S. Lourenço	
	027	University of Macau	Paróquia de Nossa Senhora do Carmo (Taipa)	
	028	Macao University of Science and Technology		
	029	Macao Polytechnic Institute	Paróquia da Sé Catedral	
	030	Kiang Wu Nursing College of Macao	Paróquia de Santo António	
	031	Institute for Tourism Studies	Paróquia de Nossa Senhora de Fátima	
	121	Others	--	

Subjects	Working unit code number	Name of working organization
<b>Adults (aged 20-59)</b>	041	Department of Health
	042	Education and Youth Affairs Bureau
	043	Macao Government Tourist Office
	044	Statistics and Census Bureau
	045	Macao Sport Development Board
	046	Civic and Municipal Affairs Bureau
	048	Port Authority
	049	Social Welfare Institute
	050	Land, Public Works and Transport Bureau
	051	Escola Estrela do Mar Southeast School
	052	Tai Fung Bank Limited
	053	Future Bright Group
	055	Caltex Oil (Macao) Ltd.
	056	Labour Affairs Bureau
	057	CEM-Macao Electricity Company, Ltd.
	058	Xin Kang Heng Holdings Ltd.
	059	Macao Polytechnic Institute
	060	The Women's Association of Macau
	061	Macao New Chinese Youth Association
	062	Galaxy Casino, S.A.
	063	Kiang Wu Nursing College of Macao
	064	Others (individual)
	065	Venetian Macau, S.A.
	066	Volunteers Association
	067	Beneficência Sun Tou Tong de Macau, Sociedade de
	068	União Geral das Associações dos Moradores de Macau
	070	Macao Federation of Trade Unions
	141	Melco Crown Entertainment Co., Ltd.
	142	Bank of China Macao Branch
	143	Wing Hang Bank
144	The Red Cross of Macao Special Administrative Region	
145	The University of Macau	

Subjects	Senior center code number	Name of senior center	Community
<b>Seniors (aged 60~69)</b>	073	Centro de Dia da Ilha Verde	Paróquia de Nossa Senhora de Fátima (North)
	074	Asilo de Betânia	
	082	Centro de Dia de Mong - Há	
	171	Centro de Convívio Fai Chi Kei , Centro de Convívio "Kei Hong Lok Yuen" do Centro Pastoral da Areia Preta	
	172	Centro I Chon da União Geral das Associações dos Moradores de Macau, Associação de Amizade dos Moradores da Zona de Nordeste de Macau, Centro Comunitário de Iao Hon, Centro de Apoio aos Idosos da União Geral das Associações dos Moradores de Macau	
	173	Centro de Convívio "Clube de Terceira Idade	
	075	Casa para Anciãos da Paróquia de Santo António	
	076	Centro de Convívio da Associação de Mútuo Auxílio dos Moradores do Bairro de San Kio	
	082	Centro de Convívio Casa dos "Pinheiros"	
	078	Centro de Dia do Porto Interior	Paróquia da Sé Catedral, Paróquia de S. Lourenço, Paróquia de São Francisco Xavier, Paróquia de Nossa Senhora do Carmo (South and outlying islands)
	080	Centro de Convívio "Missão Luterana de Hong Kong e Macau / Centro de Terceira Idade Yan Kei"	
	081	Centro de Cuidados Especiais Longevidade (Serviço de Apoio Domiciliário)	
	082	Centro de Lazer e Recreação dos Anciãos da União Geral das Associações dos Moradores de Macau	
	082	Centro de Convívio da Associação dos Habitantes das Ilhas Kuan Iek	
	175	União Geral das Associações dos Idosos de Macau	
	176	Centro de Serviço aos Empregados da Praça de Ponte e Horta	
	177	Macao Polytechnic Institute - Seniors Academy Instituto Politécnico de Macau - Academia do Cidadão Sénior	
	178	Associação das Idosas de Fu Lun de Macau	
	179	Centro de Dia da Praia do Manduco	
	180	Others (individuals aged over 60 years old working in the adult group sampling sites)	



## **Acknowledgement**

The successful completion of "2010 Physical Fitness Report of Macao SAR Citizens" is the result of the joint efforts from different institutes. We, the Macao Sport Development Board, would like to sincerely thank the China Institute of Sports Science, General Administration of Sports of China for their technical support. We would also like to thank the coordinating institutes, Department of Health, Education and Youth Affairs Bureau, Social Welfare Institute, Tertiary Education Services Office and Macao Polytechnic Institute for their great support and coordination. In addition, we would like to express our deepest thanks to all the schools, government organizations, private organizations, social organizations and senior centers involved for their active compromise and support. We would also like to thank all the subjects who participated in the study.



體育

體育發展局

Instituto do Desporto

[www.sport.gov.mo](http://www.sport.gov.mo)

ISBN 978-99937-892-9-1



9 789993 789291