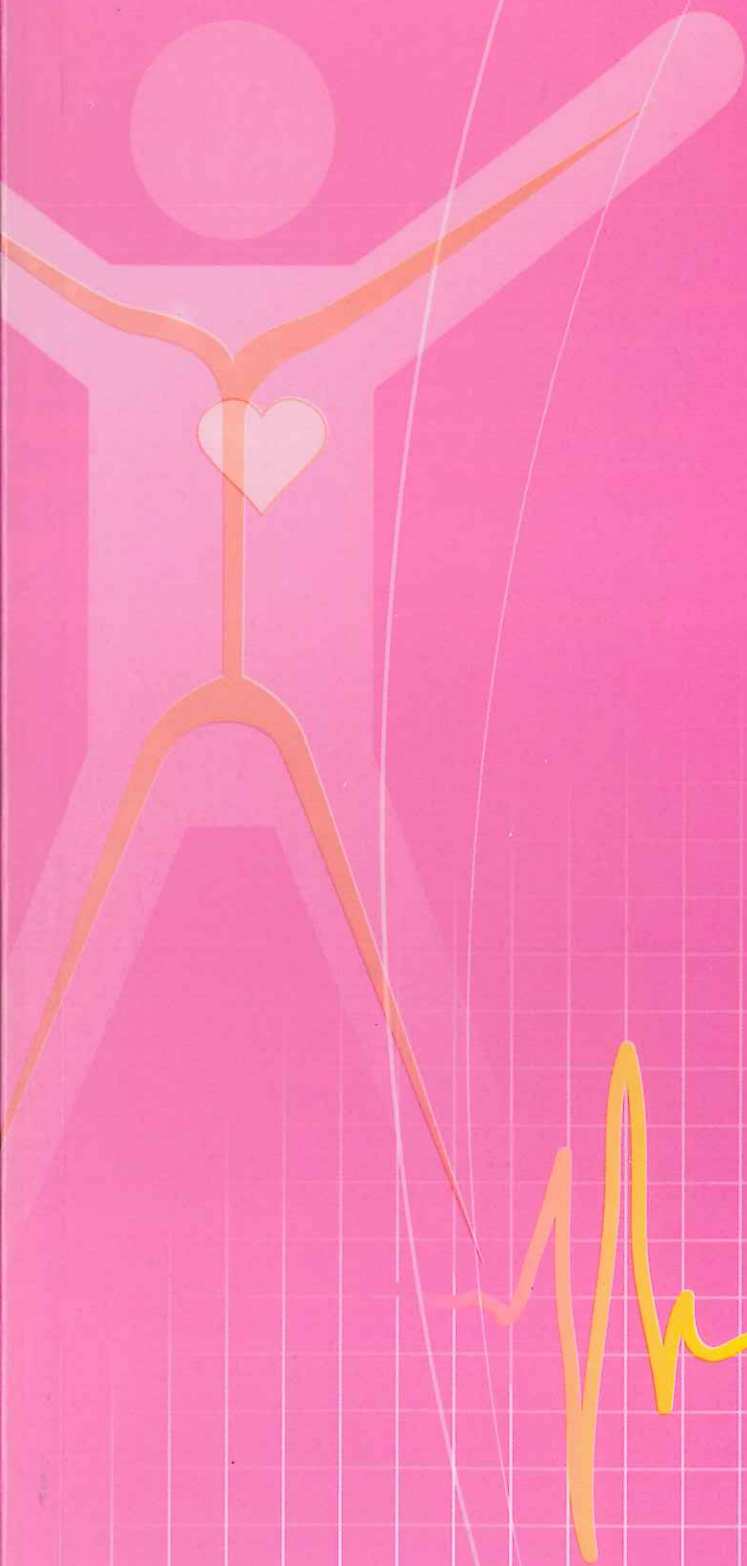


# Report of the Study of Health and Fitness on Adults in Macao SAR in 2001



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**Macao Sport Development Board, Macao SAR**

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## Preface

Good health is our most precious possession. Although it is usually only in times of illness or injury that we really appreciate good health, more and more people are realizing that health is not simply the lack of disease.

Nowadays, with the development of economy, our community grows larger, the stresses of urbanization and modern life continue to increase, and our interdependence becomes steadily more complex, our health and fitness-mental as well as physical-will be ever more important determinants of our ability to lead full, productive, and successful lives, both on an individual level and members of the larger society.

Caring of people's physical health and psychological health is a very important way for government to promote people's health and fitness. Effective and scientific measurements should be taken in order to learn the status of people's health and fitness level, and to boost the development of mass exercises. In 2001, a research project led by Macao Sport Development Board was carried out, the purpose of the project is to establish a database and a system which will be used in the future to monitor the level and to prefigure the trend of health and fitness of the adults in Macao. In the meantime, the project is expected to provide scientific basis for government's exercises policy.

The report gives us special pleasure to note the marvelous cooperation that Macao Sport Development Board has enjoyed from Macao Polytechnic Institute; from Macao Health Bureau; from China National Research Institute of Exercises Science; and especially from the subject of the research reported herein. It is precisely such cooperation, between various kinds of institutions, organizations, and individuals, that will prove so vital to our society's healthy productive future.

**Macao Sport Development Board  
September, 2002.**

**PART ONE:**

**Organization and Implementation of the Survey**

## **PART ONE    Organization and Implementation of the Survey**

### **1. Scheme of the Survey**

#### **1.1 Participants and Sampling**

Participants are adults of 20-59 years old in Macao. Qualified participants should meet the following requirements: healthy Chinese living or working in Macao at least 3 years. People with serious diseases (heart disease, high blood pressure, hepatitis, nephritis, phthisic, anaemia, etc.), acute diseases, physical abnormality are not qualified.

Two types of the participants are: physical workers (worker, driver, waiter, etc.) and non physical workers (official, teacher, researcher, manager, etc.).

In all subsequent analysis, men and women, physical workers and non physical workers are considered separately, and the ages are given either in 5-year groups (e.g., (20~24, 25~29,...55~59). There are totally 32 age groups, each age group includes 100 samples, the total samples number is 3200.

#### **1.2 Method for Sampling**

Economic condition, working environment as well as living condition are considered when sampling.

800 non physical workers were sampled from 3~5 governmental departments; 800 non physical workers were selected from teachers and researchers in institutions such as Macao University, Macao Polytechnic Institute and Institute for tourism studies; 800 physical workers were selected from nurses, waiters, drivers, etc.; 800 physical workers came from cotton spinners, manufacturing workers, etc..

#### **1.3 Organization of the survey**

With the cooperation of Macao Polytechnic Institute, Macao Health Board and National Research Institute of Sports Science, Macao Sport Development Board launched the survey.

##### **1.3.1 Leading office of the survey**

The members of leading office were composed of officials of Macao Sport Development Board, researchers from China National Research Institute of Sports Science and local research institutes. The office had the charge of the whole work, including liaison, training, technological instruction, selecting data, analyzing data and writing the survey paper.

##### **1.3.2 Testing team**

The testing team consists of 18 persons, including a team leader, a checker, a doctor, and 15 testers. The captain had the charge of liaison and technological instruction. The checker answered for checking the test cards and data selecting.

The arrangement of the testers is the following:



4 testers (2 men and 2 women) answered the following test items: Height, body weight, chest girth, waist girth, hip girth, skinfold thickness; resting heart rate and blood pressure: two testers; Sit-and-reach: 1 tester; 10m\*4 Shuttle run: 1 tester; Grip strength and back strength: 1 tester; Vertical jump: 1 tester; Pull-ups: 1 tester; Sit-ups within 60 seconds: 1 tester; One foot stand with eyes closed (OFSEC): 1 tester; Response time: 1 tester; Vital capacity: 1 tester; Step test: 1 tester.

### 1.3.3 Requirements for the testing team

- a. The team should have a doctor, who can provide first aid when necessary.
- b. Women and men should be separated in different rooms when they are tested the following items: Height, body weight, chest girth, waist girth, hip girth, skinfold thickness.
- c. The testers should include nurses, gym instructors, and those who can operate computer.
- d. Testers should be energetic, serious-minded and familiar with the test.

## 1.4 Items of the Survey

Table 1-1 Items Tested

|                        | Items                                   | 20-39 years old | 40-59 years old |
|------------------------|---|-----------------|-----------------|
| Shape                  | Height                                  | *               | *               |
|                        | Weight                                  | *               | *               |
|                        | Chest girth                             | *               | *               |
|                        | Waist girth                             | *               | *               |
|                        | Hip girth                               | *               | *               |
|                        | Skinfold thickness                      | *               | *               |
| Physiological Capacity | Resting heart rate                      | *               | *               |
|                        | Blood pressure                          | *               | *               |
|                        | Vital capacity                          | *               | *               |
|                        | Step Test                               | *               | *               |
| Physical capacity      | 10m*4 Shuttle run                       | *               |                 |
|                        | Vertical jump                           | *               |                 |
|                        | Grip strength                           | *               | *               |
|                        | Back strength                           | *               |                 |
|                        | Sit-and-reach                           | *               | *               |
|                        | One foot stand with eyes closed (OFSEC) | *               | *               |
|                        | Selective response time                 | *               | *               |
|                        | Simple response time                    | *               | *               |
|                        | Pull-ups                                | *               |                 |
|                        | Sit-ups within 60 seconds               | *               |                 |
| Blood Tests            | TCH                                     | *               | *               |
|                        | HDL                                     | *               | *               |
|                        | LDL                                     | *               | *               |
|                        | TG                                      | *               | *               |
|                        | Glucose                                 | *               | *               |
|                        | HBsAg                                   | *               | *               |
|                        | Anti-HBs                                | *               | *               |

\*: Test required

#### 1.4.1 Questionnaire

1. Occupation: (1) manager; (2) researcher; (3) office clerk; (4) waiter or seller; (5) technician or assistant professional; (6) farmer or fisher; (7) blue-collar worker ; (8) craftsman; (9) driver, machine operator or ship-fitter.
  2. Working environment: (1) outdoor; (2) indoor (ventilative); (3) indoor (air-condition used)
  3. Educational: (1) illiteracy; (2) elementary school; (3) high school; (4) college/university; (5) master; (6) doctor
  4. Employment: (1) full-time; (2) part-time; (3) jobless
  5. Have you been in sick in the past 5 years? (If you answer " no", go to question 7 please.) : (1) yes; (2) no
  6. Diseases (only select the most 3 serious diseases): (1) cancer; (2) circulatory diseases (3) respiratory diseases; (4) accidental hurt;(5) digestive system diseases; (6) high blood pressure; (7) endocrinopathy; (8) urinary or reproductive system diseases; (9) diabetes; (10) others
  7. Do you smoke? (1) no; (2) yes; (3) ever
  8. Do you drink? (If your answer is "no", please go to question 11): (1) no; (2) yes.
  9. Frequency of drink: (1) once per month; (2) 1~2 times per week; (3) 3~4 times per week; (4) 5~7 times per week
  10. Types of drink: (1) alcohol; (2) beer; (3) yellow wine; (4) rice wine; (5) wine or ratafee; (6) mixed wine
  11. Do you participate in physical activities at least once per week?: (1) yes; (2) no
  12. The reason keeps you from participating in exercises: (1) no interest; (2) no space; (3) heavy housework; (4) no instruction; (5) busy work; (6) other
  13. What kind of sports do you often watch? (Select the most 3 interesting ones): (1) basketball; (2) volleyball; (3) soccer; (4) gymnastics; (5) swimming; (6) Wushu; (7) boxing; (8) table tennis; (9) billiards; (10) golf; (11) badminton; (12) water polo; (13) baseball; (14) softball; (15) weight lifting; (16) fence-play; (17) wrestling and judo; (18) other
- If you participate in physical activities, please complete question 14-18:
14. Your physical activities (Select the most favorite 3 ones): (1) basketball; (2) volleyball; (3) soccer; (4) gymnastics; (5) swimming; (6) Wushu; (7) boxing; (8) table tennis; (9) billiards; (10) golf; (11) badminton; (12) water polo; (13) baseball; (14) softball; (15) weight lifting; (16) fence-play; (17) wrestling and judo; (18) jogging; (19) hike; (20) qigong; (21) other
  15. Time spent in exercises: (1) 60 minutes or more each time; (2) 30-60 minutes each time; (3) less than 30 minutes each time
  16. The places where you participate in exercises: (1) stadium or arena; (2) park; (3) office or home; (4) public space; (5) road or street; (6) club; (7) other
  17. Exercises frequency: (1) 1~2 times per week; (2) 3~4 times per week; (3) 5 times or more per week
  18. The purposes for exercises: (1) improvement; (2) shaping; (3) disease recovery; (4) competition; (5) recreation; (6) sociality; (7) other

## 2. Detailed Rules of the Survey

### 2.1 Test Methods

#### 2.1.1 Shape

##### A. Height

Signification: height is an important sign of skeleton development. Combined with other items such as girth, body weight analysis, height can also reflect some features of the physique.

Preparations: Height measuring gauge

Procedures:

Barefooted, the participant stands uprightly on the base of the gauge, with his heels, the sacrum part and the part between his shoulder blades in touch with the upright rod. Keep looking ahead, holding the upper fringes of the auricles and the lower rims of the eyes at the same level.

The tester stands at the right side of the participants, presses the level board lightly on the head top and reads out the degree when his eyes are at the same level of the level board.

Record the degree on the rod right under the level board.

Points for the tester's attention:

- 1) The height gauge should be placed on a flat place against the wall. The graduation on the rod should face the source of light.
- 2) Check to see if the participants heel, sacrum and shoulder blades are leaning against the rod.
- 3) The level board should not be pressed too hard or too lightly on the head top. Plaited or coiled hair on top of the head should be loosened.



##### B. Weight

Signification: body weight refers to the net weight of the body. It reflects the nutritious status of the body. Combined with skinfold thickness analysis, it can also reflect the degree of muscle development.

Preparations: weight scale

Procedures:

- 1) Put the weight scale on the flat floor and adjust it to "zero" degree.
- 2) After the participants stands on the center of the pan in a natural manner until the scale gets balanced and then reads out the degree. Record the number.

Points for the tester's attention:

Adjust the weight scale to "zero" degree before it is used.

##### C. Chest girth

Signification: the chest girth indicates the development of the thorax and chest and back muscles. It is also an indirect indication of vital capacity.

Preparations: fabric tape

Procedures:

- 1) The participant stands naturally with his feet apart at the width paralleled with his shoulders' width, relaxes his shoulders, and droops his arms naturally.
- 2) The tester stands facing the participants, and makes measurement with the upper edge of the tape going around the chest through the back and the lower fringe of the shoulder blades.
- 3) Record the girth at the state of calmness toward the end of breathing.

Points for the tester's attention:

- 1) The participants should stand naturally with his arms drooping. He can not throw out his chest, or hunch his back or take a deep breath.
- 2) The record-keeper should stand behind the participants to make sure that the tape is in its right place without any twist or loop.
- 3) The tape cannot be held too tight or too loosely.

#### D. Waist girth

Signification: the chest girth indicates the thickness of abdominal fat and the development of the nutritious status of the body. A suitable waist girth is significant for the health of adults.

Preparations: fabric tape

Procedures:

The participant stands naturally with his feet apart at the width paralleled with his shoulders' width, relaxes his shoulders, and droops his arms naturally.

The tester stands facing the participants, and makes measurement with the tape going flatly around the waist (1 cm above the bellybutton ).

Points for the tester's attention:

- 1) The tape cannot be held too tight or too loosely.
- 2) The participants should wear short pants and T-shirt.

#### E. Hip girth

Signification: Recent evidence suggest that the waist to hip girth ratio is an excellent index for detaining the risk of disease associated with high body fat.

Preparations: fabric tape

Procedures:

The participant stands naturally with his feet apart at the width paralleled with his shoulders' width, relaxes his shoulders, and keeps his arms naturally.

The tester stands facing the participants, and makes measurement with the tape going flatly around the widest points of the hip.

Points for the tester's attention:

- 1) The tape cannot be held too tight or too loosely.
- 2) The participants should wear short pants and T-shirt.

#### F. Skinfold thickness (subscapular, triceps, and abdominal skinfolds)

Signification: The purpose of the measurement of skinfold thickness is to estimate overall body fatness.

Preparations: skinfold thickness measure

Procedures:

- 1) Under the shoulder blades: Vertically pinch up the skin about 1 cm under the shoulder blade, and measure the skinfold thickness with 0.5 mm as the measurement unit.
- 2) At the triceps of the upper arm: The participant stands naturally with his arms drooping in a relaxed manner. The tester measures the skinfold thickness from the vertical axis of the upper arm to the central part at the back of the upper arm, using 0.5 mm as the measurement unit.
- 3) At the ilium: Vertically pinch up the skin at the juncture of the navel's horizontal line and the vertical line of the arm pit, and then measure the skinfold thickness at this point, using 0.5 mm as the measurement unit.

Points for the tester's attention:

- 1) Use the thumb and the index finger to pinch up the skin off the muscles.
- 2) Place the heads of the skinfold thickness measure about 1 cm down the skin pinched up by fingers to measure the skinfold thickness.
- 3) For correct measurement of skinfold thickness, proper pressure should be applied on the measurer, which needs practice beforehand.

#### 2.1.2 Physiological Capacity

##### A. Heart rate (at resting)

Signification: an alternative test to determine the function of the heart and circulatory system.

Preparations: stethoscope, stopwatch

Procedures:

- 1) The participant sits at the right side of the tester.
- 2) The tester measures the heart rate by listening to the front area of the heart of the participants.
- 3) Measure the pulses per minute of the participants at resting.
- 4) Record the pulses per minute.

Points for the tester's attention:

- 1) The participants must not do any strenuous exercise just before the test.
- 2) If the participants' heart rates are 100 times and more, he should be re-tested. The tester should ask him if he is nervous and how his health status is recently, and write down what is said on record.

##### B. Blood pressure

Signification: blood pressure refers to the lateral pressure of blood onto the vessel wall while it flows inside the blood vessel. When ventricle contracts, the arterial pressure at the highest

value is called systolic pressure. When the ventricle relaxes, the arterial pressure at the lowest values is called diastolic pressure. When a normal person is at the state of resting, his arterial pressure is relatively stable with a small range of fluctuation. Blood pressure is an very important index of determining the function of heart and circulator system.

Preparations: Mercury sphygmomanometer, stethoscope

Procedures:

- 1) The participants sits at the right of the tester, naturally stretches his arm forward and places it on the desk at the level of his heart.
- 2) The tester ties up the pulse pressure bandage around the upper arm of the participants, leaving the elbow pit exposed, and puts the center of the stethoscope on the point of arterial pulse against the skin.
- 3) Press air into the bandage to make mercury column rise quickly till the arterial pulse cannot be heard, further raise the mercury column about 30 cm higher, and release the air slowly. The mercury at which the first pulse is clearly heard is the systolic pressure. Continue to release air till the loud and clear sound of the pulse become to be a vague and reverberating sound. The mercury column then is the diastolic pressure.
- 4) Record the systolic and the diastolic pressure.

Points for the tester's attention:

- 1) Blood pressure testing should be done after the pulse test. Keep the testing room in quietness.
- 2) The upper arm of the participants must not be pressed hard by too tight clothes.
- 3) Before doing the test on blood pressure, the tester should check to see if the mercury column is at the zero position, and if not, adjust it. Bubbles in the mercury column should be pressed out.

### C. Vital capacity

Signification: the vital capacity is used to measure the ventilation function of the lungs. It is an import index of evaluating physical fitness level.

Preparation: Spirometer, air blowpipe

Procedures:

- 1) Fix the end of the blowpipe onto the air-outlet.
- 2) Adjust the spiral regulator by hand to set the reading on the display panel to "zero".
- 3) The participants inhales fully, puts the blowpipe against his mouth, blows air into the pipe once with all efforts without leaking any air till he can no longer exhale.
- 4) Ask the participants to repeat this 3 times and choose the largest volume as his vital capacity.

Points for the tester's attention:

- 1) Keep the testing instrument at level surface during the test.
- 2) Do not cover by hand the small hole on the upper part of the spirometer when using it.



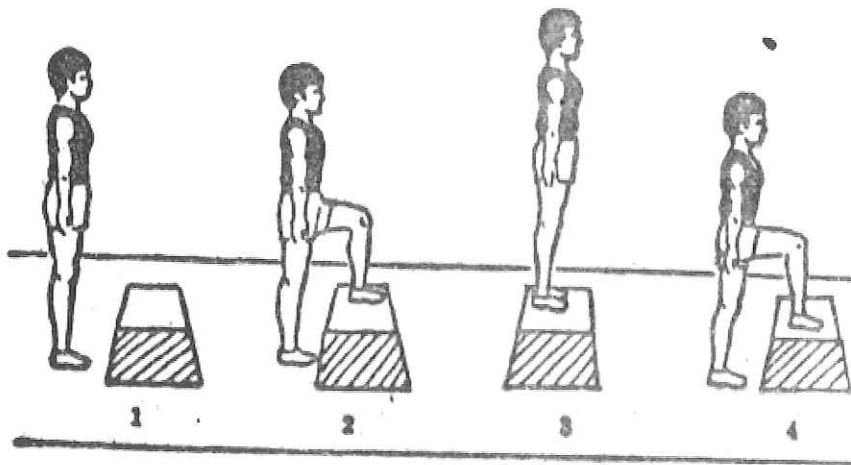
#### D. Step test

Signification: step test is an alternative test to determine the cardiorespiratory fitness level. The step test works on the principle that individuals with a high level of cardiorespiratory fitness will have a lower heart rate during recovery from 3 minutes of standardized exercise (bench stepping) than less conditioned individuals.

Preparation: Step measurer (step height for men is 30 cm, for women is 25cm)

Procedures:

- 1) The tester assists the participants in the step test. The tester is responsible for timing the test and assisting the participants in maintaining the proper stepping cadence. The exercise cadence is 30 complete steps (up and down) per minute during a 3-minute exercise period, which can be maintained by a metronome from the tester. Thus the participants need to make one complete step cycle every 2 seconds. Note that the participant straightens his knees during the "up" phase of the test.
- 2) After completing the test, sit quietly in a chair. Find the participants's pulse for 30-second periods during the following recovery times: 1 to 1.5 minutes post exercise, 2 to 2.5 minutes post exercise, and 3 to 3.5 minutes post exercise. The tester should assist the participants in timing the recovery period and recording the heart rates. Note that the accuracy of this test depends on the faithful execution of 30 steps per minute during the test and the valid measurement of heart rate during the appropriate recovery times.



#### 2.1.3 Physical Capacity

##### A. Grip strength

Signification: girth strength is an alternative test to determine the muscular strength of hand and front arm.

Preparations: Grip strength measurer

Procedures:

- 1) Turn of the switch of the power source.
- 2) Adjust the distance of the gripping handle (rotate the knob till the second joint of the index finger bends 90 degrees. )
- 3) The participant stands relaxed with his arms drooping. He holds tight the grip strength measurer and presses it as hard as possible till the indicator stops moving. This test is repeated 3 times. The greatest volume of the 3 times is taken as the grip strength of the participants.

Points for the tester's attention:

- 1) After recording the result, press the on/c button once more before the next test is done.
- 2) When the participants applied force, his arm cannot touch his body, nor can he wield the grip strength measurer. And he can only exert force once.

#### B. Pull-ups

Signification: girth strength is an alternative test to determine the muscular endurance of arm and should.

Preparations: Gym mat

Procedures:

- 1) The participant use his palms supports and keeps the body in a hanging position, with the width of his two hands the same as the width of his shoulders.
- 2) With the "start" signal from the tester, the participants bends his arms and raises his body .
- 3) The participants then stretches his arms, lowering his body to the starting position.
- 4) Following the pattern of b and c, the participant repeats bending and stretching of his arms as many times as possible.
- 5) Record the times completed.

Points for the tester's attentions:

- 1) If the hanging of the body exceeds more than 2 seconds, stop the test.
- 2) Tell the participants not to swing the body during the test, but to make sure of the reaction force is not allowed.

#### C. Sit-up within 60 seconds

Signification: The sit-up test is probably the best field test available to evaluate abdominal muscle endurance.

Preparations: gym mat and stopwatch

Procedures:

- 1) The participants lies on the gym mat, straightens his back, bends his knees 90 degrees, and holds the back of his head with crossed fingers of his hands.
- 2) The test assistant faces the participants in a sitting position or standing position (with his knees bent), and keeps making a press on the insteps of the participants.
- 3) Following the "start" signal from the tester, the participants raises his trunk till his elbows touch his knees, and then lies back and sits up again. Do this as many times as possible within





60 seconds. Each time he lies back, his back must be kept straight and must be in touch of the gym mat.

4) Record the sit-ups within 60 seconds.

Points for the tester's attention:

- 1) Tell the participants to cross his fingers and hold back of his head with them.
- 2) Sit-ups with hands loosened or touching the mat are not counted into the times.
- 3) Stop the test if the participants lies on the mat for more than 2 seconds.

#### D. Back strength

Signification: girth strength is an alternative test to determine the muscular strength of back.

Preparations: Back strength measurer

Procedures:

- 1) Pluck the indicator of the back strength measurer to zero degree.
- 2) The participants stands naturally with two feet on the foot-board, droops his arms naturally before the body, and puts his hands in front of the thighs with the fingers stretched out.
- 3) The tester adjusts the length of the chain ring, sets the gripping handle in parallel with the middle fingers of the participants, and then asks the participants to bend his trunk 30 degrees to grasp the griping handle. The participant pulls the back strength measurer with all his effort till the indicator stops moving. This is done twice and the greater volume is taken at the back-muscle strength of the participants.

Points for the tester's attentions:

- 1) The participants should do adequate warming-up exercise for the waist.
- 2) The participants should apply force upward when pulling the back strength measurer. Do not pull it by using the force produced as body falls back.
- 3) While pulling the back strength measurer, the participants should keep his knees unbent and use force slowly and continuously. Do not use explosive force suddenly.

#### E. Vertical Jump

Signification: girth strength is an alternative test to determine the muscular strength of back.

Preparations: Vertical Jump measurer

Procedures:

- 1) The participant stands on the board of the vertical jump measurer.
- 2) The tester adjusts the indicator of the back strength measurer to zero degree.
- 3) The participants jump vertically with all his effort. Repeat test once again. The better record is counted.

Points for the tester's attention:

Bending the legs and shrinking the abdomen are not allowed when the participants jumps.



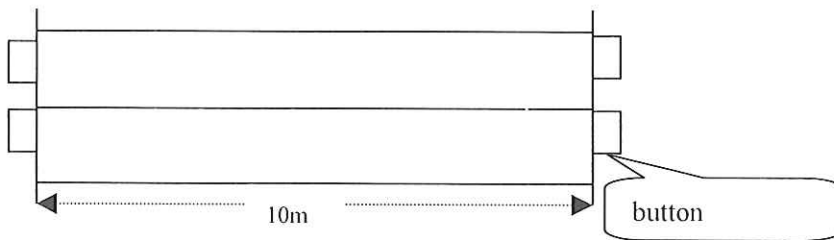
#### F. 10m\*4 shuttle run

Signification: girth strength is an alternative test to determine the speed and agility.

Preparations: 10m\*4 shuttle run measurer, 10-meter-track

Procedures:

- 1) With the "start" signal from the tester, the participants press the button of the measurer and then start to run with all his effort.
- 2) At the end of the 10-meter-track, press another button and then run back.
- 3) Repeat the pattern "a" and "b" once more, and record the time he used.



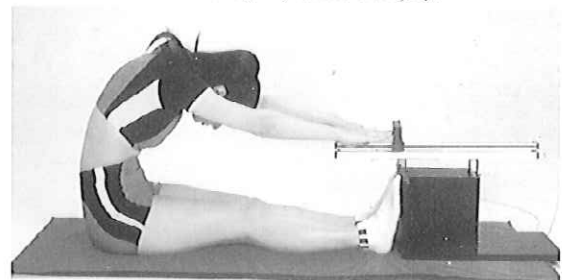
#### G. Sit-and-reach

Signification: the sit-and-reach test measures the ability to flex the trunk, which means stretching the lower back muscles and the muscles in the back of the thigh (hamstrings).

Preparation: Sit-and-reach measurer

Procedures:

- 1) Facing the platform of the measurer, the participants sits with his legs stretched straight and his heels set against the platform. The fingertips of his hands can touch the steel board of the measurer.
- 2) Slowly bend his trunk forward and push the steel board as far as possible while at the same time keeping his knees straight.
- 3) Repeat test once again. The better record is counted.



Points for the tester's attention:

- 1) The participants must take off his shoes.
- 2) The tester should sit at the side of the participants, and press his knees by hand to prevent the participants from bending his knees.
- 3) Tell the participants not to push the steel board instantly, but to push it slowly to the farthest possible and keep it for two seconds.

#### H. Selective Response Time

Signification: a measurement to test the harmony between nerve system and muscular system.

Preparation: Response time measurer

Procedures:

- 1) The participants press the "start" button with his middle



finger.

- 2) Move his middle finger as quickly as possible to press the button which sends the signals (light and sound signals).The signals will end when the button be pressed.
- 3) Press the "start" button again, and wait for another signals.
- 4) There are totally 5 signals in one test. When the test ends, all the buttons send out light and sound signals. Record the number on the display.

#### I. One Foot Stand with Eyes Closed (OFSEC)

Signification: a measurement to test the ability of balance.

Preparations: OFSEC measurer, stopwatch

Procedures:

- 1) The participants stands on the measurer with one foot, droops his arms naturally and closes his eyes.
- 2) Uplift another leg naturally, and then begin timing.
- 3) Stop timing when the participants can not keep balance.

Points for the tester's attention:

- a. High-heel shoes are not allowed in the test.
- b. Eyes should kept closed during the test.

#### 2.1.4 Blood Tests

A series of blood tests was carried out in fasting participants. The following tests were performed, involving the collection of 15 ml of blood (fasting samples):

-- Total Cholesterol (TCH)

- High Density Lipoprotein (HDL)
- Low Density Lipoprotein (LDL)
- Triglycerides (TG)
- Glucose (Blood sugar)

## 2.2 Methods for Filling in the Survey Card

### 2.2.1 Personal information of the participants

- a. Fill the name, sex, age, address into the card according to the facts.

If on the test day, the participants' birthday has passed:

Age= the year test done – the year the participants born

If on the test day, the participants' birthday has not passed:

Age= the year test done – the year the participants born – 1

- b. The card number: The number is given by test team.

- c. Test date: the test date is the day when the test is done

If test conducted on August 8, 2000, please fill the test date like the following example;

|   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|
| 2 | 0 | 0 | 0 | 0 | 8 | 0 | 8 |
|---|---|---|---|---|---|---|---|



- d. Birth date: yyyy/mm/dd
- e. Sex code: Male - 1; Female - 2
- f. Enterprise code number: The code is given by the test team
- g. Occupation types of the participants: non physical worker-1; Physical worker - 2
- h. Birth place, Years living time in Macao, Number of health insurance card: according to the facts.

#### 2.2.2 Methods for Filling in the questionnaire

The participant should select the answers according to the fact.

#### 2.2.3 Methods for filling in the physical test result

If test result of height and weight are 168.5cm and 59.0kg respectively, please fill the test date into the card like the following example;

Height: 

|   |   |   |   |   |
|---|---|---|---|---|
| 1 | 6 | 8 | . | 5 |
|---|---|---|---|---|

 cm  
 Body weight: 

|   |   |   |   |
|---|---|---|---|
| 5 | 9 | . | 0 |
|---|---|---|---|

 kg

### 2.3 Organization of the test

#### 2.3.1 Testing team

The testing team should include captain, medical professionals, gym instructors and some female tester. Training was required before the team start its job.

The captain had the charge of organization, liaison and technological instruction.

A testing team consists of 12 persons including 3 or more women, the testers were divided into three groups: physique group, physiological capacity group and physical fitness group. The three groups answered for the measurement of indices of physique, physiology capacity and physical fitness respectively.

Women and men should be separated in different rooms when they are tested the following items: body weight, chest girth, waist girth, hip girth, skinfold thickness.

The team should have a doctor, who can provide first aid when necessary.

#### 2.3.2 Procedure and organization of the survey

a. The purpose and signification should be introduced to the test receivers before the test, and the detailed method of each item should also introduced by professionals.

b. Procedure of the test: physiological capacity (pulse, blood pressure and vital capacity) → physique→physical fitness. If it is difficult to follow the procedure, pulse and blood pressure should be tested first, and the step test should be the last item to be tested.

Measurement of physiological capacity should be in an quiet environment; women and men should be separated in different rooms when they are tested the following items: body weight, chest girth, waist girth, hip girth, skinfold thickness.

c. The checker selected the survey cards after carefully checking them.

d. Before each measurement, preparative works such as suitable dress and warm-up are required, detailed information of each item should also introduced by professionals.

e. In order to guarantee the quality of the test, the captain should harmonize the test procedure.

### 2.3.3 Requirements for the tester

- a. Do the test strictly according to the test requirements.
- b. Do preparative works before every test.
- c. Be serious in the work.
- d. Be kind and careful to every test receiver.
- e. Be cooperative in the work.

### 2.3.4 Requirements for the participant

- a. Be cooperative with the tester.
- b. Dress according to the test requirements.
- c. To warm up for physical fitness tests.
- d. Be quiet during the test.

**PART TWO      Results and Analysis**

## PART TWO Results and Analysis

### 1. Summary of the Questionnaire

#### 1.1 Distributing of the Participants

Participants in this work are adults of 20-59 years old in Macao. The total samples divided into 4 groups by sex (men and women) and occupation (physical worker and non physical worker). After checking, 3961 samples were finally chosen to form a valid amount of samples. Among the 3961 samples, there were 1952 men including 1158 physical workers and 794 non physical workers, the number of women was 2009 including 893 physical workers and 1116 non physical workers. (see table 2-1)

Table 2-1 Sample distribution

| Age groups<br>(year) | Men              |                      | Women            |                      |
|----------------------|------------------|----------------------|------------------|----------------------|
|                      | Physical workers | non physical workers | Physical workers | non physical workers |
| 20~                  | 99               | 85                   | 83               | 107                  |
| 25~                  | 147              | 103                  | 103              | 248                  |
| 30~                  | 119              | 151                  | 89               | 208                  |
| 35~                  | 194              | 148                  | 123              | 205                  |
| 40~                  | 279              | 116                  | 154              | 159                  |
| 45~                  | 198              | 99                   | 142              | 99                   |
| 50~                  | 92               | 63                   | 128              | 71                   |
| 55~                  | 30               | 29                   | 71               | 19                   |
| Total                | 1158             | 794                  | 8931             | 1116                 |

#### 1.2 Education Level of the Participants

More than half (55.5%) of the samples graduated from high school, 23.6% of the samples graduated from elementary school, and more than one fourth samples held a college diploma. Young people below 30 years old had a higher education level. 93% men have a full-time job, while a lower percentage women have a full-time job. The percentage of female full-time job holders drops after the age 40, and the percentage of men drops after age 55. (see table 2-2)

Table 2-2 Education distribution

| Sex   | Education          | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 | 50-54 | 55-59 | Total |
|-------|--------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Men   | Illiteracy         | 1.1   |       | 0.7   |       | 0.8   | 0.7   |       | 1.7   | 0.5   |
|       | Elementary school  | 8.7   | 9.2   | 14.4  | 24.0  | 32.9  | 37.7  | 31.0  | 18.6  | 23.6  |
|       | High school        | 54.9  | 51.6  | 45.6  | 56.1  | 57.0  | 57.2  | 63.2  | 76.3  | 55.5  |
|       | University/college | 34.8  | 37.6  | 32.2  | 15.2  | 7.1   | 2.4   | 4.5   | 3.4   | 17.5  |
|       | Master             | 0.5   | 1.6   | 6.7   | 4.4   | 2.3   | 2.0   | 1.3   |       | 2.8   |
|       | Doctor             |       |       | 0.4   | 0.3   |       |       |       |       |       |
|       | Total              | 9.4   | 12.8  | 13.8  | 17.5  | 20.2  | 15.2  | 7.9   | 3.0   | 100.0 |
| Women | Illiteracy         |       | 0.3   |       | 1.2   | 1.3   | 1.2   | 4.0   | 3.3   | 1.1   |
|       | Elementary school  | 1.1   | 2.8   | 5.4   | 21.6  | 32.4  | 41.5  | 55.3  | 40.0  | 22.2  |
|       | High school        | 47.9  | 45.6  | 58.2  | 59.8  | 54.5  | 51.9  | 38.7  | 48.9  | 51.6  |
|       | University/college | 50.5  | 48.4  | 30.0  | 15.2  | 9.9   | 5.0   | 1.5   | 7.8   | 22.8  |
|       | Master             | 0.5   | 2.8   | 6.4   | 2.1   | 1.9   | 0.4   | 0.5   |       | 2.2   |
|       | Doctor             |       |       |       |       |       |       |       |       |       |
|       | Total              | 9.5   | 17.5  | 14.8  | 16.3  | 15.5  | 12.0  | 9.9   | 4.5   | 100.0 |

### 1.3 Working environment

93% men and 85% women have a full-time job. The percentage of female full-time job holders drops after the age 40, and for men is at the age of 55 (see table 2-3).

Table 2-3 Employment of the Samples

| Sex   | Job types | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 | 50-54 | 55-59 | Total |
|-------|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Men   | Full-time | 80.9  | 96.8  | 94.8  | 97.4  | 95.2  | 96.2  | 91.9  | 71.7  | 93.7  |
|       | Part-time | 7.5   | 2.4   | 1.9   | 1.8   | 3.0   | 2.4   | 5.4   | 7.5   | 3.2   |
|       | Jobless   | 11.6  | 0.8   | 3.3   | 0.9   | 1.8   | 1.4   | 2.7   | 20.8  | 3.1   |
|       | Total     | 9.0   | 13.0  | 14.1  | 17.7  | 20.5  | 15.3  | 7.8   | 2.8   | 100.0 |
| Women | Full-time | 84.7  | 95.1  | 93.8  | 92.8  | 80.4  | 79.8  | 67.9  | 47.1  | 85.7  |
|       | Part-time | 4.7   | 2.3   | 3.1   | 3.9   | 7.3   | 4.7   | 6.9   | 5.9   | 4.5   |
|       | Jobless   | 10.6  | 2.6   | 3.1   | 3.3   | 12.2  | 15.5  | 25.2  | 47.1  | 9.8   |
|       | Total     | 9.3   | 19.0  | 16.0  | 16.7  | 15.7  | 11.7  | 8.7   | 2.8   | 100.0 |

Among the samples who have a job, 70% men and 84% women work in an environment with air-conditioning. While, there are still 20% men and 3% women work outdoor (see table 2-4).



Table 2-4 Working environment (%)

| Sex   | Working conditions        | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 | 50-54 | 55-59 | Total |
|-------|---------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Men   | Outdoor                   | 28.7  | 19.0  | 14.9  | 15.0  | 17.7  | 21.5  | 36.3  | 27.3  | 20.2  |
|       | Indoor (Ventilated)       | 16.5  | 4.8   | 5.2   | 7.4   | 8.2   | 10.0  | 21.9  | 11.4  | 9.3   |
|       | Indoor (air-conditioning) | 54.9  | 76.2  | 79.9  | 77.6  | 74.0  | 68.5  | 41.8  | 61.4  | 70.5  |
|       | Total                     | 8.7   | 13.1  | 14.2  | 18.0  | 20.6  | 15.3  | 7.7   | 2.3   | 100.0 |
| Women | Outdoor                   | 5.5   | 0.9   | 2.1   | 2.7   | 7.0   | 6.5   | 3.8   |       | 3.6   |
|       | Indoor (Ventilated)       | 6.1   | 3.8   | 3.8   | 15.0  | 16.8  | 16.2  | 32.8  | 24.2  | 11.9  |
|       | Indoor (Air-conditioning) | 88.3  | 95.3  | 94.1  | 82.4  | 76.2  | 77.3  | 63.4  | 75.8  | 84.5  |
|       | Total                     | 9.6   | 20.2  | 16.9  | 17.7  | 15.1  | 10.9  | 7.7   | 1.9   | 100.0 |

#### 1.4 Reported Diseases by Participants

In the past 5 years, collectively 17.6% men and 24% women were sick with an illness. 16.9% of male physical workers were sickened, and the percentage for male non physical workers is little bit larger, 18.6%. 29.3% female physical workers and 19.8% female non physical workers had an illness (see table 2-5).

Table 2-5 Percentages for sickness in the past 5 years (%)

| Sex   | Disease | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 | 50-54 | 55-59 | Total |
|-------|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Men   | Yes     | 14.1  | 14.4  | 15.6  | 17.8  | 16.5  | 19.3  | 28.4  | 20.3  | 17.6  |
|       | No      | 85.9  | 85.6  | 84.4  | 82.2  | 83.5  | 80.7  | 71.6  | 79.7  | 82.4  |
| Women | Yes     | 16.8  | 12.8  | 16.2  | 23.2  | 25.6  | 34.0  | 43.2  | 36.7  | 24.0  |
|       | No      | 83.2  | 87.2  | 83.8  | 76.8  | 74.4  | 66.0  | 56.8  | 63.3  | 76.0  |

Among the men who ever had an illness in the past 5 years, 28.1% suffered respiratory disease, 22.5% were sickened with digestive system disease, 14.2% accidental hurt. As for women, 21.0% suffered digestive system disease, 17.1% other disease, 12.7% cancer and 12.3% high blood pressure. The percentage of digestive system disease is larger for both men and women. For men, with the increase of age, the percentage of high blood pressure got larger, while the percentage of accidental hurt decreased. An exceptional large percentage (41.7%) of accidental hurt for 20-24 years old men should catch our attention. (see table 2-6).

Table 2-6 Distribution of diseases (%)

| Sex   | Diseases                | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 | 50-54 | 55-59 | Total |
|-------|-------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Men   | Cancer                  |       | 5.9   | 4.9   | 1.8   | 1.7   | 1.9   |       |       | 2.2   |
|       | Circulatory diseases    |       |       |       | 1.8   |       | 5.6   | 7.0   |       | 2.2   |
|       | Respiratory             |       | 35.3  | 36.6  | 32.1  | 28.3  | 24.1  | 16.3  | 16.7  | 28.1  |
|       | Accidental hurt         |       | 14.7  | 9.8   | 23.2  | 6.7   | 16.7  | 2.3   |       | 14.2  |
|       | Digestive system        |       | 20.6  | 22.0  | 23.2  | 25.0  | 22.2  | 37.2  |       | 22.5  |
|       | High blood pressure     |       | 5.9   | 2.4   | 3.6   | 8.3   | 11.1  | 20.9  | 25.0  | 9.3   |
|       | Endocrinopathy          |       |       | 2.4   | 3.6   | 3.3   | 3.7   |       |       | 2.5   |
|       | Urinary or reproductive |       | 2.9   |       |       | 8.3   |       | 7.0   | 16.7  | 3.4   |
|       | Diabetes                |       |       |       | 3.6   | 5.0   | 1.9   | 2.3   | 16.7  | 2.8   |
|       | Other                   |       | 14.7  | 22.0  | 7.1   | 13.3  | 13.0  | 7.0   | 25.0  | 13.0  |
| Women | Cancer                  | 12.5  | 17.5  | 11.1  | 18.6  | 10.3  | 9.3   | 15.5  | 3.0   | 12.7  |
|       | Circulatory diseases    | 3.1   |       | 2.2   | 1.4   | 5.1   | 6.7   | 1.2   | 12.1  | 3.7   |
|       | Respiratory             | 18.8  | 30.0  | 20.0  | 10.0  | 9.0   | 4.0   | 4.8   | 9.1   | 11.2  |
|       | Accidental hurt         | 15.6  | 5.0   | 8.9   | 2.9   | 2.6   | 2.7   | 1.2   | 3.0   | 4.2   |
|       | Digestive system        | 31.3  | 25.0  | 26.7  | 25.7  | 24.4  | 16.0  | 15.5  | 6.1   | 21.0  |
|       | High blood pressure     |       |       | 2.2   | 1.4   | 6.4   | 25.3  | 21.4  | 36.4  | 12.3  |
|       | Endocrinopathy          | 9.4   | 12.5  | 22.2  | 10.0  | 6.4   | 8.0   | 10.7  | 3.0   | 10.1  |
|       | Urinary or reproductive | 3.1   |       |       | 5.7   | 12.8  | 8.0   | 4.8   | 9.1   | 6.1   |
|       | Diabetes                |       |       |       |       |       | 4.0   | 4.8   | 3.0   | 1.8   |
|       | Other                   | 6.3   | 10.0  | 6.7   | 24.3  | 23.1  | 16.0  | 20.2  | 15.2  | 17.1  |

### 1.5 Cigarette Smoking Status

Among the men, 27% are smokers, 11.7% are ex-smokers, and 60.8% never smoke. The percentage for cigarette consumers aged 50 and over (16.0-18.0%), is larger than that of younger. 35% of male physical workers smoke, this percentage is larger than that of non physical workers (15.9%). As for women, only less than 5% smoke, and 68.7% below 34 years old. Little difference lies between female physical workers and female non physical workers. (see table 2-7)

Table 2-7 Cigarette smoking status in each age group (%)

| Sex   | Age groups (year) | Non-smoker | Smoker | Ex-smoker | Total |
|-------|-------------------|------------|--------|-----------|-------|
| Men   | 20~               | 66.8       | 27.2   | 6.0       | 100   |
|       | 25~               | 54.8       | 34.0   | 11.2      | 100   |
|       | 30~               | 61.9       | 21.9   | 16.3      | 100   |
|       | 35~               | 59.9       | 28.7   | 11.4      | 100   |
|       | 40~               | 58.2       | 30.6   | 11.1      | 100   |
|       | 45~               | 59.9       | 29.6   | 10.4      | 100   |
|       | 50~               | 69.7       | 16.8   | 13.5      | 100   |
|       | 55~               | 64.4       | 16.9   | 18.6      | 100   |
|       | Total             | 60.8       | 27.5   | 11.7      | 100   |
| Women | 20~               | 87.9       | 7.9    | 4.2       | 100   |
|       | 25~               | 87.7       | 9.1    | 3.1       | 100   |
|       | 30~               | 90.9       | 7.1    | 2.0       | 100   |
|       | 35~               | 95.1       | 3.0    | 1.8       | 100   |
|       | 40~               | 94.9       | 3.2    | 1.9       | 100   |
|       | 45~               | 95.9       | 2.9    | 1.2       | 100   |
|       | 50~               | 97.0       | 1.0    | 2.0       | 100   |
|       | 55~               | 97.8       | 2.2    |           | 100   |
|       | Total             | 92.9       | 4.9    | 2.2       | 100   |

### 1.6 Alcoholic drink status

The result shows that 43.9% men and 17.1% women drink. The percentage of drink consumer decreases with increasing age, for example, in the year of 20-24, 60.3% men and 26.8% women drink; while in the age of 55-59, the percentages for men and women are 35.6% and 6.7% respectively. Slight difference exists between male physical workers (50.1%) and non physical workers (48.2%) who drink. As for women, the percentage for non physical workers drinking (20.5%) is larger than that of physical workers (12.9%).

More than half of drinkers drink once to twice per month, the frequency increases with increasing age. Among the drink consumers aged 40 and over ( for women, 45 and over), about 10-20% drink 5 to 7 times per month. Beer is the chief alcohol drink, 86.0% men and 64% women drink consumers drank beer. 24% women prefer wine or ratafee, and with the increase of age, this percentage rises. (see table 2-8)

Table 2-8 Alcoholic drink status in each group (%)

| Sex   | Drink | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 | 50-54 | 55-59 | Total |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Men   | No    | 39.7  | 46.0  | 48.1  | 48.0  | 52.7  | 60.6  | 52.3  | 64.4  | 50.7  |
|       | Yes   | 60.3  | 54.0  | 51.9  | 52.0  | 47.3  | 39.4  | 47.7  | 35.6  | 49.3  |
|       | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Women | No    | 73.2  | 70.7  | 82.2  | 84.4  | 87.5  | 88.8  | 93.0  | 93.3  | 82.9  |
|       | Yes   | 26.8  | 29.3  | 17.8  | 15.6  | 12.5  | 11.2  | 7.0   | 6.7   | 17.1  |
|       | Total | 100   | 100   | 100   | 100   | 100   | 100   | 100   | 100   | 100   |

## 1.7 Physical Activities Status

The result shows, 44.0% men do not participate exercises, 35.0% casually, and 21.0% regularly participate exercises. As for women, the percentages mentioned above are 55.5%, 25.5% and 19.0% respectively. 35-39 years old adults have the largest percentage (51.8% men, 62.0% women) for not participating exercise. A larger percentage of 20-24 and 55-59 years old adults participate exercises. (see table 2-9)

Table 2-9 Frequency of exercises participation (%)

| Sex   | Exercises | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 | 50-54 | 55-59 | Total |
|-------|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Men   | No        | 23.0  | 40.8  | 47.9  | 51.8  | 44.8  | 47.1  | 43.5  | 40.7  | 44.0  |
|       | Casually  | 42.6  | 39.2  | 42.3  | 31.4  | 34.0  | 29.6  | 35.7  | 15.3  | 35.0  |
|       | Regularly | 34.4  | 20.0  | 9.7   | 16.9  | 21.2  | 23.4  | 20.8  | 44.1  | 21.0  |
| Women | No        | 55.9  | 59.8  | 59.7  | 62.0  | 56.7  | 50.4  | 46.9  | 28.4  | 55.5  |
|       | Casually  | 28.2  | 31.6  | 29.0  | 25.5  | 24.0  | 22.9  | 17.5  | 13.6  | 25.5  |
|       | Regularly | 16.0  | 8.6   | 11.3  | 12.6  | 19.2  | 26.7  | 35.6  | 58.0  | 19.0  |

Regularly: 3 times or more per week, 30 minutes or more each time

Casually: 1-2 times per week

No: no exercises participation

Compared with male non physical workers, male physical workers have a larger percentage for not participating exercises, but have a nearly equal percentage for regular exercises participation.

## 1.8 Purposes for exercises participation

Fitness, according to the survey results, is the primary purpose for exercises participation. Recreation, for the men, is the secondary purpose. Shaping is the secondary purpose for women. (see table 2-10)

Table 2-10 Purposes for exercises participation (%)

| Sex   | Purposes         | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 | 50-54 | 55-59 | Total |
|-------|------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Men   | Fitness          | 63.5  | 74.0  | 46.2  | 80.7  | 74.7  | 74.6  | 87.5  | 73.1  | 72.8  |
|       | Shaping          | 1.6   | 4.0   | 23.1  | 8.8   | 7.2   | 9.0   | 6.3   | 15.4  | 7.9   |
|       | Disease recovery |       |       |       |       | 3.6   | 1.5   | 3.1   | 3.8   | 1.5   |
|       | Competition      | 19.0  | 16.0  | 15.4  | 3.5   | 2.4   | 10.4  |       |       | 8.7   |
|       | Recreation       | 11.1  | 6.0   | 15.4  | 7.0   | 10.8  | 4.5   | 3.1   | 7.7   | 8.2   |
|       | Other            | 4.8   |       |       |       | 1.2   |       |       |       | 1.0   |
| Women | Fitness          | 40.0  | 46.7  | 66.7  | 65.9  | 81.7  | 78.1  | 73.9  | 92.2  | 72.0  |
|       | Shaping          | 26.7  | 33.3  | 27.3  | 22.0  | 8.3   | 15.6  | 7.2   | 3.9   | 15.3  |
|       | Disease recovery |       |       | 6.1   | 7.3   | 5.0   | 1.6   | 13.0  |       | 4.8   |
|       | Competition      | 6.7   | 3.3   |       |       |       |       |       |       | 0.8   |
|       | Recreation       | 10.0  | 10.0  |       | 4.9   | 3.3   | 4.7   | 4.3   | 3.9   | 4.8   |
|       | Sociality        |       |       |       |       |       |       | 1.4   |       | 0.3   |
|       | Other            | 16.7  | 6.7   |       |       | 1.7   |       |       |       | 2.1   |

### 1.9 Participation Influence of physical activities

Several factors affect people's exercise participation. 55% men attribute that they are not participating exercises due to work load(women, 48.0%), 24% men (women, 16.9%) ascribe to the lack of interest. (see table 2-11)

Table 2-11 Reasons for not participating exercises (%)

| Sex             | Reasons         | 20-24       | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 | 50-54 | 55-59 | Total |
|-----------------|-----------------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Men             | No interest     | 11.9        | 16.7  | 12.5  | 11.5  | 17.1  | 11.1  | 17.2  | 25.0  | 14.2  |
|                 | No space        | 4.8         | 12.7  | 9.4   | 6.3   | 4.0   | 4.4   | 4.7   | 8.3   | 6.6   |
|                 | Heavy housework | 4.8         | 2.0   | 7.8   | 9.2   | 9.7   | 15.6  | 1.6   |       | 8.2   |
|                 | No instruction  | 11.9        | 1.0   | 3.1   | 2.9   | 4.6   | 2.2   | 6.3   |       | 3.6   |
|                 | Busy work       | 47.6        | 54.9  | 59.4  | 63.8  | 57.1  | 55.6  | 67.2  | 50.0  | 58.4  |
|                 | Other           | 19.0        | 12.7  | 7.8   | 6.3   | 7.4   | 11.1  | 3.1   | 16.7  | 9.0   |
|                 | Women           | No interest | 21.2  | 19.9  | 13.5  | 11.9  | 14.8  | 16.0  | 28.7  | 16.7  |
| No space        |                 | 9.6         | 5.8   | 4.1   | 4.0   | 6.3   | 0.8   | 3.4   | 4.2   | 4.9   |
| Heavy housework |                 | 3.8         | 6.8   | 14.0  | 26.2  | 19.3  | 24.4  | 21.8  | 37.5  | 17.1  |
| No instruction  |                 |             | 2.9   | 4.7   | 4.5   | 4.0   | 6.7   | 4.6   | 4.2   | 3.9   |
| Busy work       |                 | 51.9        | 54.9  | 56.7  | 46.5  | 47.2  | 47.1  | 33.3  | 29.2  | 48.9  |
| Other           |                 | 13.5        | 9.7   | 7.0   | 6.9   | 8.5   | 5.0   | 8.0   | 8.3   | 8.3   |

## 1.10 Sorts of Physical Activities

Jogging, for men in Macao, is the most favorite exercises they often attend (25.5%), the rest are, in order of precedence, soccer (19.7%), swimming (17.1%), basketball (11.0%). The exercises in which women often participate are, in order of precedence, swimming (26.8%), jogging (20.6%), gym.(12.5%).

With the increase of age, the percentage for participating high competitive exercises events falls, while the percentage for less competitive activities as jogging, gym and Wushu rises.

The exercises events that men in Macao often watch are soccer, basketball. The most favorite sport events which women often watch are basketball, swimming and gym. (see table 2-12, 2-13)

Table 2-12 Percentage for sport events which Macao's adults often attend(%)

|       | basketball | volleyball | soccer | gym  | swimming | Wushu | boxing | table tennis | billiards | golf | badminton | softball | weightlifting | wrestling/judo | other | jogging | hike | qigong | Total |
|-------|------------|------------|--------|------|----------|-------|--------|--------------|-----------|------|-----------|----------|---------------|----------------|-------|---------|------|--------|-------|
| Men   | 11.0       | 1.2        | 19.7   | 2.7  | 17.1     | 4.1   | 0.3    | 2.6          | 1.1       | 0.1  | 4.4       | 0.1      | 1.2           | 0.1            | 6.1   | 25.5    | 2.5  | 0.4    | 100   |
|       | basketball | Volleyball | soccer | gym  | swimming | Wushu | boxing | table tennis | billiards | golf | badminton | softball | weightlifting | fence-play     | other | jogging | hike | qigong | Total |
| Women | 2.3        | 2.0        | 0.1    | 12.5 | 26.8     | 7.9   |        | 1.4          | 0.3       | 0.1  | 6.8       | 0.1      | 0.2           | 0.1            | 12.6  | 20.6    | 5.3  | 0.9    | 100   |

Table 2-13 Percentage for sport events which Macao's adults often watch (%)

|       | basketball | volleyball | soccer | gym  | swimming | Wushu | boxing | table tennis | billiards | golf      | badminton  | fence-play | wrestling/judo | other          | Total |
|-------|------------|------------|--------|------|----------|-------|--------|--------------|-----------|-----------|------------|------------|----------------|----------------|-------|
| Men   | 19.9       | 6.9        | 48.5   | 2.7  | 6.6      | 4.5   | 1.9    | 2.0          | 0.2       | 0.1       | 1.9        | 0.1        | 0.3            | 4.5            | 100   |
|       | basketball | volleyball | soccer | gym  | swimming | Wushu | boxing | table tennis | golf      | badminton | water polo | softball   | fence-play     | wrestling/judo | other |
| Women | 9.9        | 26.2       | 8.2    | 16.4 | 19.8     | 7.1   | 0.3    | 2.4          | 0.9       | 2.9       | 0.1        | 0.1        | 0.1            | 0.3            | 5.3   |

## 1.11 Time Spent for Physical Activities

Among the people who attend exercises, most of them (49.9% men and 46.9% women ) spend 30 to 60 minutes in their daily activity. By increasing age, time consumed for exercises falls. Take men for example, when aged 20 to 24, 47.1% use 60 minutes or more each time, while when aged 50-54, this percentage falls down to 21.8%. (see table 2-14)

Table 2-14 Time spent for exercises (%)

| Sex   | Time             | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 | 50-54 | 55-59 | Total |
|-------|------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Men   | 60 min plus      | 47.1  | 40.8  | 34.8  | 22.8  | 21.9  | 22.6  | 21.8  | 34.3  | 30.0  |
|       | 30-60min         | 45.7  | 42.9  | 41.3  | 60.5  | 51.6  | 54.2  | 49.4  | 51.4  | 49.9  |
|       | Less than 30 min | 7.1   | 16.3  | 23.9  | 16.7  | 26.5  | 23.2  | 28.7  | 14.3  | 20.1  |
| Women | 60 min plus      | 31.3  | 25.4  | 27.1  | 22.0  | 23.1  | 31.9  | 43.7  | 44.4  | 29.7  |
|       | 30-60min         | 44.6  | 49.3  | 50.0  | 50.4  | 46.3  | 47.9  | 38.8  | 44.4  | 46.9  |
|       | Less than 30 min | 24.1  | 25.4  | 22.9  | 27.6  | 30.6  | 20.2  | 17.5  | 11.1  | 23.4  |

### 1.12 Locations for Exercises

Park is the primary location for most Macao adults to attend exercises. Stadiums and arenas rank secondary. Nearly 60% participate in exercises in the locations mentioned above. With the growth of age, the percentage for parks rises, while the percentage for stadiums and arenas falls. The percentage of women going in for exercises in clubs is larger than in compare to men. Among the men participating exercises, 42.7% of physical workers and 22.7% of non physical workers go to park. Physical workers have a smaller percentage (20.7%) for going to stadiums or arenas than non physical workers (40.7%). As for women, 16.9% of non physical workers and 7.7% physical workers go for club. Different economic states and educational levels maybe the main reason that causes the differences. (see table 2-15)

Table 2-15 Exercises locations (%)

| Sex   | Locations              | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 | 50-54 | 55-59 | Total |
|-------|------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Men   | Stadium/ arena         | 49.6  | 47.3  | 38.4  | 22.6  | 17.9  | 21.7  | 14.9  | 17.1  | 29.6  |
|       | Park                   | 17.0  | 21.6  | 21.0  | 40.9  | 43.1  | 47.8  | 42.5  | 34.3  | 34.0  |
|       | Office/home            | 0.7   | 2.0   | 2.9   | 4.3   | 5.5   | 6.4   | 13.8  | 28.6  | 5.4   |
|       | Public space           | 19.9  | 8.8   | 13.0  | 6.7   | 11.9  | 10.2  | 8.0   | 8.6   | 11.2  |
|       | Road or street         | 2.1   | 11.5  | 10.1  | 11.6  | 14.7  | 8.3   | 8.0   | 5.7   | 9.8   |
|       | Club                   | 2.8   | 1.4   | 8.7   | 7.3   | 4.6   | 1.9   | 4.6   |       | 4.3   |
|       | Other                  | 7.8   | 7.4   | 5.8   | 6.7   | 2.3   | 3.8   | 8.0   | 5.7   | 5.6   |
| Women | Gymnasium s / stadiums | 30.1  | 22.9  | 24.2  | 14.5  | 15.6  | 19.3  | 19.4  | 26.6  | 20.8  |
|       | Park                   | 20.5  | 27.1  | 33.3  | 39.5  | 44.4  | 47.9  | 50.5  | 53.1  | 39.1  |
|       | Office/ home           | 8.4   | 5.7   | 6.7   | 9.7   | 13.3  | 10.1  | 7.8   | 4.7   | 8.6   |
|       | Public space           | 10.8  | 8.6   | 5.0   | 4.8   | 4.4   | 6.7   | 2.9   |       | 5.6   |
|       | Road or street         | 7.2   | 4.3   | 3.3   | 5.6   | 3.0   | 4.2   | 2.9   | 3.1   | 4.2   |
|       | Club                   | 13.3  | 16.4  | 20.0  | 19.4  | 10.4  | 8.4   | 5.8   | 3.1   | 12.8  |
|       | Other                  | 9.6   | 15.0  | 7.5   | 6.5   | 8.9   | 3.4   | 10.7  | 9.4   | 8.9   |

### 1.13 Comparison with the Mainland

Economic and cultural differences exist between Macao and the mainland of China, and these differences may bring different fitness levels between peoples in the two areas. In order to find some differences, we compared the data of Macao with that of Beijing, Shanghai, Guangdong, Sichuan, and Jilin.

The table 2-16 shows Beijing has the largest percentage for adults (men 26.2%, women 25.0%) who participate exercises in the seven areas, Macao ranks second. But, Macao has the lowest percentage (44.0%) for exercises non-participants, while Sichuan has the largest percentage (74.7%).

Table 2-16 Exercise participants in Macao and other cities/ provinces (%)

| Sex   |           | Non-participants | Participants |
|-------|-----------|------------------|--------------|
| Men   | Macao     | 44.0             | 21.0         |
|       | Beijing   | 46.4             | 26.2         |
|       | Guangdong | 46.8             | 20.5         |
|       | Gansu     | 60.7             | 19.0         |
|       | Jilin     | 67.6             | 19.0         |
|       | Shanghai  | 68.9             | 10.4         |
|       | Sichuan   | 74.7             | 11.4         |
| Women | Beijing   | 50.3             | 25.0         |
|       | Macao     | 55.5             | 19.0         |
|       | Guangdong | 56.1             | 18.7         |
|       | Gansu     | 61.9             | 19.3         |
|       | Sichuan   | 73.6             | 14.0         |
|       | Shanghai  | 77.0             | 8.3          |
|       | Jilin     | 78.6             | 12.3         |

Most adults on the Mainland participate in exercises in streets, public space and gymnasiums; while Macao people mainly at stadium or arena, parks and clubs. (see table 2-17)

Table 2-17 Locations for Exercises on the Mainland (%)

| Sex   | Locations             | Beijing | Jilin | Shanghai | Guangdong | Sichuan | Gansu |
|-------|-----------------------|---------|-------|----------|-----------|---------|-------|
| Men   | Stadium/ arena        | 22.9    | 23.1  | 27.7     | 32.8      | 25.2    | 26.0  |
|       | Park                  | 10.7    | 10.6  | 7.1      | 9.1       | 5.0     | 7.1   |
|       | Office/home           | 6.2     | 3.9   | 12.5     | 9.4       | 5.7     | 6.1   |
|       | Public space          | 22.0    | 18.2  | 18.8     | 17.7      | 23.7    | 24.4  |
|       | Road or street        | 26.8    | 34.3  | 21.1     | 18.5      | 29.2    | 22.1  |
|       | Club                  | 11.5    | 10.1  | 12.8     | 12.5      | 11.1    | 14.2  |
| Women | Other                 | 15.7    | 15.1  | 18.9     | 31.4      | 25.8    | 19.4  |
|       | Gymnasiums / stadiums | 18.6    | 18.7  | 11.7     | 15.8      | 10.5    | 9.9   |
|       | Park                  | 6.7     | 8.4   | 15.6     | 13.3      | 8.1     | 4.1   |
|       | Office/ home          | 19.8    | 20.2  | 19.7     | 18.4      | 22.2    | 36.5  |
|       | Public space          | 29.9    | 24.4  | 21.3     | 9.4       | 23.1    | 18.5  |
|       | Road or street        | 9.4     | 13.2  | 12.8     | 11.7      | 10.3    | 11.6  |

The percentage for swimming participants in Macao is larger than that of the Mainland, while the percentages for jogging and gym are lower than those of the Mainland (table 2-18).



Table 2-18 Percentages for exercise participants on the Mainland (%)

| Sex   | Exercises items   | Beijing | Jilin | Shanghai | Guangdong | Sichuan | Gansu |
|-------|-------------------|---------|-------|----------|-----------|---------|-------|
| Men   | Jogging           | 25.3    | 34.9  | 20.3     | 25.0      | 33.4    | 30.7  |
|       | Swimming          | 7.2     | 2.3   | 7.2      | 7.0       | 4.0     | 6.0   |
|       | Hike              | 18.5    | 15.3  | 6.0      | 12.4      | 16.6    | 11.2  |
|       | Ball games        | 27.6    | 31.4  | 32.1     | 36.2      | 22.8    | 23.3  |
|       | Qigong            | 0.6     | 1.2   | 1.9      | 0.6       | 1.9     | 2.3   |
|       | Wushu             | 3.0     | 3.0   | 1.5      | 1.9       | 4.0     | 5.8   |
|       | Gym               | 3.2     | 4.3   | 11.7     | 3.9       | 3.7     | 7.0   |
|       | Mountain climbing | 4.0     | 1.5   | 0.1      | 3.5       | 2.3     | 7.7   |
|       | other             | 10.6    | 6.1   | 19.1     | 9.4       | 11.3    | 6.0   |
| Women | Jogging           | 14.6    | 18.5  | 13.4     | 13.6      | 22.2    | 20.3  |
|       | Swimming          | 8.7     | 2.8   | 6.5      | 6.7       | 2.4     | 3.6   |
|       | Hike              | 28.4    | 16.1  | 9.3      | 11.7      | 21.5    | 11.8  |
|       | Ball games        | 11.1    | 15.7  | 9.3      | 21.6      | 7.8     | 8.0   |
|       | Qigong            | 1.0     | 2.2   | 0.7      | 1.3       | 0.5     | 0.8   |
|       | Wushu             | 3.6     | 6.9   | 0.9      | 3.9       | 4.9     | 13.4  |
|       | Gym               | 17.4    | 29.1  | 40.1     | 25.5      | 31.7    | 32.5  |
|       | Mountain climbing | 4.5     | 0.4   |          | 3.7       | 1.2     | 5.3   |
|       | Other             | 10.6    | 8.4   | 19.7     | 11.9      | 7.8     | 4.3   |

The main reason for Macao adults' not going in for exercise is work load. The percentage for this reason is higher in Macao than that of the mainland. (table 2-19)

Table 2-19 Reasons for not going for exercises in Macao and the Mainland (%)

| Sex             | Reasons         | Beijing     | Jilin | Shanghai | Guangdong | Sichuan | Gansu | Macao |
|-----------------|-----------------|-------------|-------|----------|-----------|---------|-------|-------|
| Men             | No interest     | 18.8        | 24.6  | 18.3     | 21.2      | 20.6    | 25.5  | 14.2  |
|                 | Busy work       | 46.4        | 33.9  | 52.0     | 61.1      | 29.2    | 42.9  | 58.4  |
|                 | Heavy housework | 10.1        | 18.0  | 10.3     | 8.0       | 7.6     | 13.2  | 8.2   |
|                 | No space        | 11.4        | 6.7   | 4.7      | 4.5       | 9.0     | 1.8   | 6.6   |
|                 | No instruction  | 1.4         | 0.4   | 1.0      | 0.8       | 0.8     | 0.3   | 3.6   |
|                 | other           | 11.9        | 16.4  | 13.7     | 4.5       | 32.8    | 16.3  | 9     |
|                 | Women           | No interest | 14.0  | 20.4     | 19.6      | 14.9    | 19.2  | 16.3  |
| Busy work       |                 | 44.3        | 33.3  | 42.3     | 42.0      | 23.7    | 39.9  | 48.9  |
| Heavy housework |                 | 20.6        | 26.4  | 20.6     | 31.7      | 17.0    | 25.5  | 17.1  |
| No space        |                 | 10.1        | 3.2   | 4.2      | 2.8       | 7.3     | 1.5   | 4.9   |
| No instruction  |                 | 1.0         | 0.2   | 1.2      | 1.2       | 0.5     | 0.8   | 3.9   |
| other           |                 | 10.0        | 16.6  | 12.1     | 7.4       | 32.3    | 16.1  | 8.3   |

Health improvement is the primary purpose for people to attend exercises in Macao and also in Mainland. (see table 2-20, 2-21)

Table 2-20 Comparison of casual exercises between Macao and the Mainland (%)

| Sex              | Purposes         | Beijing     | Jilin | Shanghai | Guangdong | Sichuan | Gansu | Macao |
|------------------|------------------|-------------|-------|----------|-----------|---------|-------|-------|
| Men              | Improvement      | 70.0        | 80.7  | 73.6     | 76.3      | 73.0    | 82.9  | 66.9  |
|                  | Shaping          | 4.7         | 1.2   | 1.9      | 2.8       | 1.6     | 2.8   | 8.3   |
|                  | Disease recovery | 1.2         | 0.9   | 0.4      | 1.5       | 2.5     | 0.5   | 0.9   |
|                  | Recreation       | 20.7        | 13.4  | 19.5     | 15.0      | 17.8    | 12.2  | 2.7   |
|                  | Competition      | 0.2         | 1.2   | 1.0      | 1.0       |         |       | 18.9  |
|                  | Sociality        | 0.5         |       | 0.8      | 0.5       | 1.0     | 0.4   | 0.6   |
|                  | other            | 2.6         | 2.5   | 2.7      | 2.8       | 4.1     | 1.2   | 1.8   |
|                  | Women            | Improvement | 71.6  | 77.7     | 77.4      | 75.6    | 64.9  | 82.2  |
| Shaping          |                  | 12.5        | 8.8   | 9.3      | 9.5       | 18.1    | 6.1   | 23.5  |
| Disease recovery |                  | 1.1         | 1.4   | 1.4      | 1.5       | 2.2     | 1.0   | 1.8   |
| Recreation       |                  | 10.6        | 8.4   | 8.1      | 9.0       | 9.8     | 8.8   | 1.4   |
| Competition      |                  | 0.3         | 1.9   | 0.6      | 1.0       | 0.7     | 0.4   | 9.1   |
| Sociality        |                  | 0.2         |       | 0.3      | 0.7       |         | 0.2   | 0.6   |
| other            |                  | 3.7         | 1.9   | 2.9      | 2.8       | 4.3     | 1.4   | 3.2   |

Table 2-21 Purposes of people's regularly going in for exercises in Macao and mainland (%)

| Sex              | Purposes         | Beijing     | Jilin | Shanghai | Guangdong | Sichuan | Gansu | Macao |
|------------------|------------------|-------------|-------|----------|-----------|---------|-------|-------|
| Men              | Improvement      | 85.8        | 90.3  | 80.9     | 81.3      | 83.1    | 88.1  | 72.8  |
|                  | Shaping          | 2.5         | 0.4   | 1.7      | 3.7       | 1.2     | 2.3   | 7.9   |
|                  | Disease recovery | 0.6         | 1.1   | 2.1      | 2.5       | 1.9     | 0.9   | 1.5   |
|                  | Recreation       | 8.2         | 4.6   | 11.2     | 7.2       | 7.3     | 7.2   | 8.7   |
|                  | Competition      | 0.5         | 2.4   | 0.4      | 1.4       | 2.3     | 0.9   | 8.2   |
|                  | Sociality        | 0.1         | 0.2   |          | 0.8       | 0.8     |       |       |
|                  | other            | 2.2         | 0.9   | 3.7      | 3.1       | 3.5     | 0.6   | 1     |
|                  | Women            | Improvement | 84.2  | 86.1     | 86.6      | 83.4    | 78.3  | 92.6  |
| Shaping          |                  | 6.1         | 8.8   | 5.7      | 7.8       | 8.3     | 2.7   | 15.3  |
| Disease recovery |                  | 2.7         | 1.7   | 3.1      | 1.8       | 2.2     | 2.1   | 4.8   |
| Recreation       |                  | 5.5         | 1.4   | 3.6      | 5.4       | 7.0     | 1.9   | 0.8   |
| Competition      |                  | 0.3         | 0.3   |          |           | 1.0     | 0.4   | 4.8   |
| Sociality        |                  |             |       |          | 0.4       |         |       | 0.3   |
| other            |                  | 1.3         | 1.7   | 1.0      | 1.1       | 3.2     | 0.4   | 2.1   |

Compared with the mainland, Macao adults are more inclined to attend exercises. Better facilities and more locations for exercises are available in Macao. Jogging, swimming and ball games are the favorite exercises people select in Macao. More exercises are available in Macao than on the Mainland. The reason being for the differences may be due to the economic levels between the Mainland and Macao.

## 2. Summary of Test Results

### 2.1 Shape

#### 2.1.1 Height

Adults' height decreases with increasing age. The average height of women decreases 5.3 cm, from 171.6 cm to 166.3 cm (see table 2-22). The average height decreases remarkably before age 34. After age 35, the decrease speed slows down. The average height of women decreases 5.1 cm, from 158.2 cm to 153.1 cm.

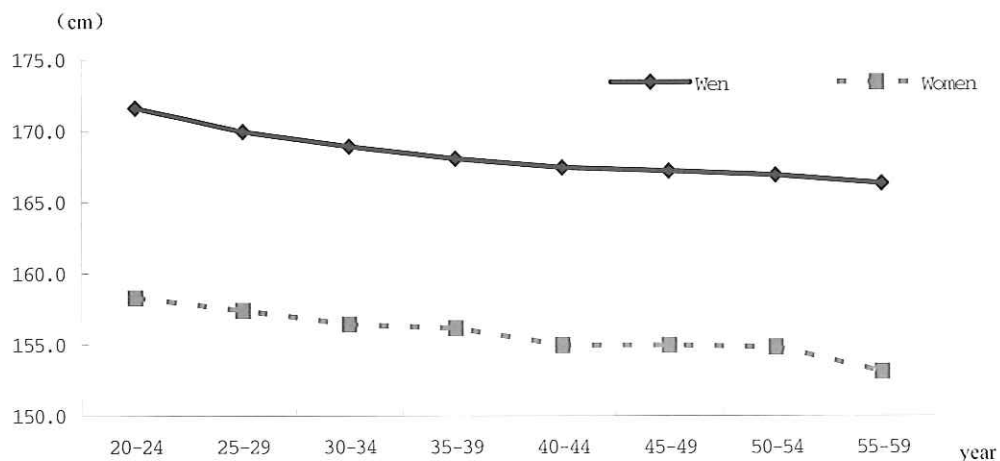
The average height of men is higher than women, and the biggest difference (13.3 cm) is in 20-24-year-old age group.

There are two reasons to cause the change of the Height. One is the physiological decrease of height along with the growth in age. The other reason is: young adults grow higher with the development of society and economy.

Table 2-22 Average Height of the Adults in Macao (cm)

| Age groups<br>(year) | Men |                 | Women |                 | Difference | Significance |
|----------------------|-----|-----------------|-------|-----------------|------------|--------------|
|                      | N   | $\bar{X} \pm S$ | N     | $\bar{X} \pm S$ |            |              |
| 20~                  | 184 | 171.6± 5.1      | 190   | 158.2± 5.4      | 13.3       | **           |
| 25~                  | 250 | 169.9± 5.8      | 351   | 157.4± 5.4      | 12.5       | **           |
| 30~                  | 270 | 168.9± 5.8      | 297   | 156.4± 5.4      | 12.5       | **           |
| 35~                  | 342 | 168.0± 6.1      | 328   | 156.1± 5.5      | 11.9       | **           |
| 40~                  | 395 | 167.4± 5.7      | 313   | 154.9± 5.4      | 12.5       | **           |
| 45~                  | 297 | 167.1± 5.8      | 241   | 154.9± 5.1      | 12.2       | **           |
| 50~                  | 155 | 166.8± 5.9      | 199   | 154.8± 5.6      | 12.1       | **           |
| 55~                  | 59  | 166.3± 5.5      | 90    | 153.1± 4.9      | 13.2       | **           |

Note: \*\* P < 0.01 \* P < 0.05



Graph 2-1 Changes of the height of the adults in Macao

## 2.1.2 Weight and Body fat

Weight reflects the nutritious status of the body, combined with skinfold thickness, it can also reflect the degree of muscle development.

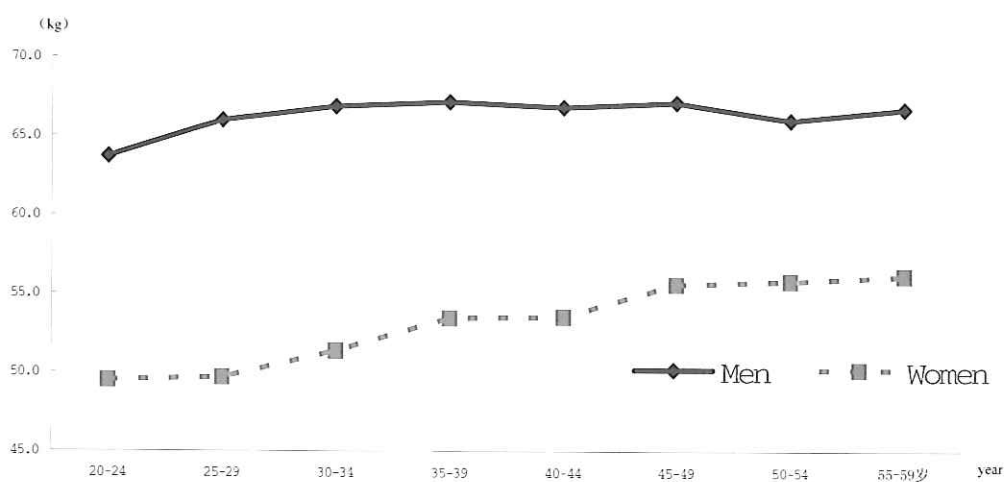
The result shows that the weight of 20-24 years old men is the smallest, which is 63.7 kg. The weight of 45-49 years old men is the largest, which is 67.1 kg. No remarkable differences found between age groups.

Women have an average weight of 49.5-56.1 kg . The weight of 20-24 years old women is the smallest. 55-59 years old women has the largest average weight of 56.1 kg. Weight increases along with the growth in age. There are two fast increase stages for weight: 30 to 44 years old, and 45 to 49. (see table 2-23, graph 2-2)

Table 2-23 Average weight of the adults in Macao

| Age groups<br>(year) | Men |                 | Women |                 | Difference | Significance |
|----------------------|-----|-----------------|-------|-----------------|------------|--------------|
|                      | N   | $\bar{X} \pm S$ | N     | $\bar{X} \pm S$ |            |              |
| 20~                  | 184 | 63.7± 9.9       | 190   | 49.5± 7.2       | 14.2       | **           |
| 25~                  | 250 | 65.9± 11.3      | 351   | 49.6± 6.8       | 16.3       | **           |
| 30~                  | 270 | 66.8± 10.6      | 297   | 51.3± 7.6       | 15.5       | **           |
| 35~                  | 342 | 67.1± 9.6       | 328   | 53.4± 7.8       | 13.7       | **           |
| 40~                  | 395 | 66.8± 9.6       | 313   | 53.5± 7.3       | 13.3       | **           |
| 45~                  | 297 | 67.1± 10.5      | 241   | 55.5± 7.7       | 11.5       | **           |
| 50~                  | 155 | 66.0± 8.7       | 199   | 55.7± 8.2       | 10.2       | **           |
| 55~                  | 59  | 66.7± 9.3       | 90    | 56.1± 7.9       | 10.6       | **           |

Note: \*\* P < 0.01 \* P < 0.05



Graph 2-2 Change of body weight of the adults in Macao

Except for women aged 35-44, there is no remarkable difference between the weights of non physical workers and physical workers, which means that job has no effect on weight.

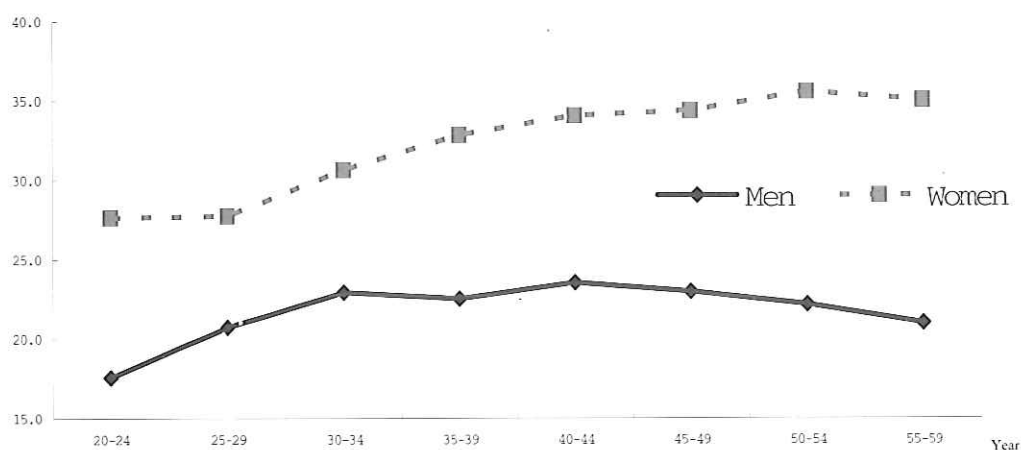
Table 2-24 Average weight of non physical workers and physical workers (kg)

| Sex   | Age group (year) | Physical workers |                 | non physical workers |                 | Difference | Significance |
|-------|------------------|------------------|-----------------|----------------------|-----------------|------------|--------------|
|       |                  | N                | $\bar{X} \pm S$ | N                    | $\bar{X} \pm S$ |            |              |
| Men   | 20~              | 99               | 63.3± 9.4       | 85                   | 64± 10.5        | -0.7       |              |
|       | 25~              | 147              | 65.9± 12.2      | 103                  | 66.0± 9.8       | -0.1       |              |
|       | 30~              | 119              | 67.5± 12.0      | 151                  | 66.3± 9.3       | 1.2        |              |
|       | 35~              | 194              | 66.7± 9.5       | 148                  | 67.7± 9.7       | -1.0       |              |
|       | 40~              | 279              | 67.0± 10.3      | 116                  | 66.4± 7.7       | 0.6        |              |
|       | 45~              | 198              | 67.5± 10.5      | 99                   | 66.3± 10.4      | 1.2        |              |
|       | 50~              | 92               | 66.3± 9.8       | 63                   | 65.4± 6.8       | 0.9        |              |
|       | 55~              | 30               | 64.4± 9.9       | 29                   | 69.0± 8.1       | -4.6       |              |
| Women | 20~              | 83               | 49.5± 7.5       | 107                  | 49.4± 7.1       | 0.0        |              |
|       | 25~              | 103              | 50.3± 7.1       | 248                  | 49.4± 6.7       | 0.9        |              |
|       | 30~              | 89               | 52.5± 8.9       | 208                  | 50.8± 6.9       | 1.7        |              |
|       | 35~              | 123              | 55.0± 8.0       | 205                  | 52.5± 7.6       | 2.5        | **           |
|       | 40~              | 154              | 54.7± 7.4       | 159                  | 52.3± 7.1       | 2.3        | **           |
|       | 45~              | 142              | 55.6± 7.8       | 99                   | 55.4± 7.7       | 0.3        |              |
|       | 50~              | 128              | 56.5± 8.3       | 71                   | 54.4± 7.7       | 2.1        |              |
|       | 55~              | 71               | 55.3± 7.3       | 19                   | 59.1± 9.5       | -3.8       |              |

Note: \*\* P < 0.01 \* P < 0.05

Body Fat Ratio (BFR) of male adults in Macao are between 17.5% and 23.5%, men aged 40-44 have the largest BFR, and the BFR of 20-24-year-old men is the smallest. From age 20 to 34, BFR increases along with the growth in age. After age 35, no remarkable differences exist between different age groups.

BFR of women in Macao fluctuates between 27.3% and 35.5%, women aged 50-54 have the largest BFR, and women aged 20-24 possess the smallest BFR. From age 20 to 44, BFR increases along with the growth in age. After age 45, no remarkable differences exist between different age groups. (see graph 2-3)



Graph 2-3 Change of BFR of the adults in Macao

Women have a larger BFR than men, and the average difference is more than 10%. In 50-54-year-old age group, there exists the largest BFR difference between women and men.

Table 2-25 Average BFR of the adults in Macao (%)

| Age group (year) | Men |                 | Women |                 | Difference | Significance |
|------------------|-----|-----------------|-------|-----------------|------------|--------------|
|                  | N   | $\bar{X} \pm S$ | N     | $\bar{X} \pm S$ |            |              |
| 20~              | 184 | 17.5± 6.3       | 190   | 27.6± 6.5       | -10.1      | **           |
| 25~              | 250 | 20.7± 7.4       | 351   | 27.7± 5.8       | -7.0       | **           |
| 30~              | 270 | 22.9± 7.1       | 297   | 30.6± 7.1       | -7.7       | **           |
| 35~              | 342 | 22.5± 6.7       | 328   | 32.8± 7.4       | -10.3      | **           |
| 40~              | 395 | 23.5± 7.7       | 313   | 34.0± 7.5       | -10.5      | **           |
| 45~              | 297 | 22.9± 7.2       | 241   | 34.3± 6.8       | -11.4      | **           |
| 50~              | 155 | 22.1± 7.1       | 199   | 35.5± 8.0       | -13.4      | **           |
| 55~              | 59  | 20.9± 6.6       | 90    | 35.0± 8.1       | -14.0      | **           |

Note: \*\* P < 0.01 \* P < 0.05

In most age groups, no remarkable BFR differences found between non physical workers and physical workers (see table 2-26).

Table 2-26 Average BFR of non physical workers and physical workers

| Sex   | Age (year) | non physical workers |                 | Physical worker |                 | Difference | Significance |
|-------|------------|----------------------|-----------------|-----------------|-----------------|------------|--------------|
|       |            | N                    | $\bar{X} \pm S$ | N               | $\bar{X} \pm S$ |            |              |
| Men   | 20~        | 99                   | 17.0± 6.1       | 85              | 18.2± 6.6       | -1.2       |              |
|       | 25~        | 147                  | 20.9± 8.3       | 103             | 20.4± 5.8       | 0.4        |              |
|       | 30~        | 119                  | 23.5± 7.7       | 151             | 22.3± 6.5       | 1.2        |              |
|       | 35~        | 194                  | 23.1± 7.0       | 148             | 21.6± 6.1       | 1.5        | *            |
|       | 40~        | 279                  | 23.8± 8.0       | 116             | 22.7± 7.0       | 1.0        |              |
|       | 45~        | 198                  | 23.3± 7.4       | 99              | 22.1± 6.8       | 1.2        |              |
|       | 50~        | 92                   | 23.3± 8.3       | 63              | 20.3± 4.3       | 3.0        | **           |
|       | 55~        | 30                   | 20.7± 7.9       | 29              | 21.1± 5.1       | -0.4       |              |
| Women | 20~        | 83                   | 27.0± 6.7       | 107             | 28.0± 6.3       | -1.0       |              |
|       | 25~        | 103                  | 27.9± 6.5       | 248             | 27.6± 5.5       | 0.3        |              |
|       | 30~        | 89                   | 31.8± 8.2       | 208             | 30.1± 6.6       | 1.7        |              |
|       | 35~        | 123                  | 34.1± 7.3       | 205             | 32.0± 7.3       | 2.0        | *            |
|       | 40~        | 154                  | 35.7± 6.9       | 159             | 32.4± 7.8       | 3.3        | **           |
|       | 45~        | 142                  | 34.7± 6.9       | 99              | 33.7± 6.7       | 1.0        |              |
|       | 50~        | 128                  | 36.0± 7.9       | 71              | 34.7± 8.1       | 1.3        |              |
|       | 55~        | 71                   | 34.4± 7.5       | 19              | 37.2± 9.9       | -2.8       |              |

note: \*\* P < 0.01 \* P < 0.05

In order to research farther on the changes of weight of Macao adults, Fat-free Weight (FBW) is calculated by the formula:  $FBW = BW \cdot (1 - BFR)$  (see table 2-27). No remarkable differences of NBW were found between different age groups. This result shows: the increase of weight with increasing age mainly because of the increase of body fat.

Table 2-27 Average FBW of the adults in Macao

| Age group<br>(year) | Men |                 | Women |                 |
|---------------------|-----|-----------------|-------|-----------------|
|                     | N   | $\bar{X} \pm S$ | N     | $\bar{X} \pm S$ |
| 20~                 | 184 | 52.0± 5.4       | 190   | 35.5± 4.0       |
| 25~                 | 250 | 51.7± 6.2       | 351   | 35.6± 3.9       |
| 30~                 | 270 | 51.0± 5.8       | 297   | 35.2± 3.5       |
| 35~                 | 342 | 51.6± 6.2       | 328   | 35.4± 3.7       |
| 40~                 | 395 | 50.6± 5.9       | 313   | 34.8± 3.4       |
| 45~                 | 297 | 51.2± 6.2       | 241   | 36.1± 4.0       |
| 50~                 | 155 | 51.0± 6.1       | 199   | 35.4± 3.9       |
| 55~                 | 59  | 52.3± 6.3       | 90    | 36.0± 3.7       |

According to the **Chinese Weight Standard** made in 2002 (see table 2-28), 56.5% men in Macao have a normal weight, 12.6% men are badly overweight. As for women, 50.0% have a normal weight, 6.5% are badly overweight, totally 30.6% are either light or very light. The result also shows that the percentage of "light" and "very light" is remarkably high in women aged 20-39. The percentages of "overweight" and "badly overweight" are larger for men than those for women.

Table 2-28 Percentages for different weight categories (%)

| Sex   | Categories          | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 | 50-54 | 55-59 | Total |
|-------|---------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Men   | Very light          | 4.9   | 10.8  | 14.1  | 15.5  | 14.4  | 14.1  | 17.4  | 8.5   | 13.2  |
|       | Light               | 26.1  | 17.6  | 14.4  | 8.2   | 12.9  | 10.8  | 12.9  | 3.4   | 13.5  |
|       | Normal              | 57.1  | 55.2  | 55.9  | 56.1  | 56.2  | 56.2  | 56.8  | 67.8  | 56.5  |
|       | Overweight          | 6.0   | 5.2   | 1.5   | 2.9   | 4.8   | 5.4   | 3.9   | 5.1   | 4.2   |
|       | Badly<br>overweight | 6.0   | 11.2  | 14.1  | 17.3  | 11.6  | 13.5  | 9.0   | 15.3  | 12.6  |
|       | Total               | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Women | Very light          | 3.7   | 3.7   | 8.8   | 8.8   | 9.9   | 11.6  | 12.1  | 14.4  | 8.5   |
|       | Light               | 29.5  | 24.5  | 21.2  | 14.0  | 26.5  | 22.4  | 20.6  | 15.6  | 22.1  |
|       | Normal              | 35.3  | 49.6  | 53.2  | 57.6  | 44.7  | 50.6  | 52.8  | 54.4  | 50.0  |
|       | Overweight          | 26.8  | 19.4  | 10.4  | 5.2   | 16.0  | 9.1   | 9.0   | 4.4   | 13.0  |
|       | Badly<br>overweight | 4.7   | 2.8   | 6.4   | 14.3  | 2.9   | 6.2   | 5.5   | 11.1  | 6.5   |
|       | Total               | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Table 2-29 shows: percentages of "overweight" and "badly overweight" for physical workers are larger than non physical workers. 59.3% male physical workers and 48.2% female non physical workers have a normal weight.

Table 2-29 Percentages of different weight categories for non physical workers and physical workers (%)

| Sex   | Occupation           | Categories | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 | 50-54 | 55-59 | Mean |     |
|-------|----------------------|------------|-------|-------|-------|-------|-------|-------|-------|-------|------|-----|
| Men   | Physical workers     | Very light | 4.0   | 9.5   | 14.3  | 16.0  | 15.1  | 15.7  | 20.7  | 10.0  | 13.9 |     |
|       |                      | Light      | 24.2  | 19.7  | 14.3  | 7.7   | 12.5  | 9.6   | 12.0  | 6.7   | 13.1 |     |
|       |                      | Normal     | 62.6  | 53.1  | 51.3  | 53.6  | 54.1  | 54.5  | 51.1  | 70.0  | 54.6 |     |
|       |                      | Overweight | 5.1   | 4.8   | 1.7   | 2.6   | 4.7   | 5.1   | 4.3   | 6.7   | 4.1  |     |
|       |                      | Badly      |       |       |       |       |       |       |       |       |      |     |
|       |                      | overweight | 4.0   | 12.9  | 18.5  | 20.1  | 13.6  | 15.2  | 12.0  | 6.7   | 14.2 |     |
|       |                      | Total      | 100   | 100   | 100   | 100   | 100   | 100   | 100   | 100   | 100  | 100 |
|       | non physical workers | Very light | 5.9   | 12.6  | 13.9  | 14.9  | 12.9  | 11.1  | 12.7  | 6.9   | 12.2 |     |
|       |                      | Light      | 28.2  | 14.6  | 14.6  | 8.8   | 13.8  | 13.1  | 14.3  |       | 14.1 |     |
|       |                      | Normal     | 50.6  | 58.3  | 59.6  | 59.5  | 61.2  | 59.6  | 65.1  | 65.5  | 59.3 |     |
|       |                      | Overweight | 7.1   | 5.8   | 1.3   | 3.4   | 5.2   | 6.1   | 3.2   | 3.4   | 4.3  |     |
|       |                      | Badly      |       |       |       |       |       |       |       |       |      |     |
|       |                      | overweight | 8.2   | 8.7   | 10.6  | 13.5  | 6.9   | 10.1  | 4.8   | 24.1  | 10.1 |     |
|       |                      | Total      | 100   | 100   | 100   | 100   | 100   | 100   | 100   | 100   | 100  | 100 |
| Women | Physical workers     | Very light | 2.4   | 5.8   | 12.4  | 11.4  | 13.0  | 12.7  | 12.5  | 12.7  | 10.8 |     |
|       |                      | Light      | 31.3  | 30.1  | 12.4  | 8.9   | 24.7  | 21.1  | 19.5  | 18.3  | 20.7 |     |
|       |                      | Normal     | 37.3  | 46.6  | 57.3  | 57.7  | 53.2  | 51.4  | 54.7  | 56.3  | 52.2 |     |
|       |                      | Overweight | 25.3  | 14.6  | 11.2  | 2.4   | 5.8   | 7.0   | 6.3   | 4.2   | 8.8  |     |
|       |                      | Badly      |       |       |       |       |       |       |       |       |      |     |
|       |                      | overweight | 3.6   | 2.9   | 6.7   | 19.5  | 3.2   | 7.7   | 7.0   | 8.5   | 7.5  |     |
|       |                      | Total      | 100   | 100   | 100   | 100   | 100   | 100   | 100   | 100   | 100  | 100 |
|       | non physical workers | Very light | 4.7   | 2.8   | 7.2   | 7.3   | 6.9   | 10.1  | 11.3  | 21.1  | 6.7  |     |
|       |                      | Light      | 28.0  | 22.2  | 25.0  | 17.1  | 28.3  | 24.2  | 22.5  | 5.3   | 23.1 |     |
|       |                      | Normal     | 33.6  | 50.8  | 51.4  | 57.6  | 36.5  | 49.5  | 49.3  | 47.4  | 48.2 |     |
|       |                      | Overweight | 28.0  | 21.4  | 10.1  | 6.8   | 25.8  | 12.1  | 14.1  | 5.3   | 16.3 |     |
|       |                      | Badly      |       |       |       |       |       |       |       |       |      |     |
|       |                      | overweight | 5.6   | 2.8   | 6.3   | 11.2  | 2.5   | 4.0   | 2.8   | 21.1  | 5.6  |     |
|       |                      | Total      | 100   | 100   | 100   | 100   | 100   | 100   | 100   | 100   | 100  | 100 |

### 2.1.3 Chest Girth (CG), Waist Girth (WG) and Hip Girth (HG)

The result shows that with the growth of age, all the three circumferences increase. WG has the largest increase of 14.6 cm, from 74.6 cm to 86.8 cm. HC has the smallest increase of 2.8 cm.

Combining with the results of weight, body fat ratio and the circumferences, the following conclusion may draw: the increase of male adults' weight primarily owing to the gained fat in the part of abdomen.

Different from Men, the increase of female adults' weight is because of the fat gained from the three parts: abdomen, hip and breast. (Table 2-30)



Table 2-30 Average CG, WG, HG of the adults in Macao (cm)

| Sex   | Age group | N   | CG              | WG              | HG              |
|-------|-----------|-----|-----------------|-----------------|-----------------|
|       |           |     | $\bar{X} \pm S$ | $\bar{X} \pm S$ | $\bar{X} \pm S$ |
| Men   | 20~       | 184 | 87.2± 6.8       | 74.6± 8.5       | 92.4± 6.1       |
|       | 25~       | 250 | 89.6± 7.7       | 78.9± 9.4       | 93.8± 6.7       |
|       | 30~       | 270 | 90.9± 7.5       | 81.7± 9.2       | 94.6± 6.0       |
|       | 35~       | 342 | 91.5± 6.6       | 83.0± 8.5       | 94.1± 5.7       |
|       | 40~       | 395 | 90.9± 6.5       | 84.1± 8.2       | 94.2± 5.7       |
|       | 45~       | 297 | 91.3± 6.6       | 84.4± 8.8       | 94.4± 5.9       |
|       | 50~       | 155 | 91.2± 6.3       | 85.2± 8.2       | 94.7± 5.2       |
|       | 55~       | 59  | 92.9± 6.9       | 86.8± 8.5       | 95.2± 6.0       |
| Women | 20~       | 190 | 80.4± 6.9       | 69.3± 6.5       | 89.4± 5.3       |
|       | 25~       | 351 | 80.9± 6.4       | 70.8± 7.0       | 89.6± 4.9       |
|       | 30~       | 297 | 82.9± 7.1       | 74.1± 7.7       | 91.0± 5.6       |
|       | 35~       | 328 | 84.7± 7.4       | 76.8± 8.8       | 92.4± 5.4       |
|       | 40~       | 313 | 85.6± 7.1       | 78.5± 8.2       | 92.4± 5.4       |
|       | 45~       | 241 | 87.3± 7.1       | 81.4± 9.0       | 93.4± 5.9       |
|       | 50~       | 199 | 87.9± 8.1       | 83.8± 9.6       | 93.3± 5.7       |
|       | 55~       | 90  | 88.5± 7.4       | 86.5± 8.9       | 94.6± 6.3       |

In general, shape of Macao adults has some traits as following:

Men have a higher Height, 20-24 years old men even have a Height in the front rank among cities nationwide. Although women have a lower average height, the data already shows an trend of increase.

The increase of weight mainly attribute to the increase of body fat. Occupation has no remarkable effect on the weight.

Waist girth increases along with the growth in age, which causes the change of shape from a "dumbbell" look to a "bucket" look. And this change is mainly because of the increase of body fat in the part of abdomen.

## 2.2 Physiological Capacity

### 2.2.1 Heart rate

Heart rate is the time of heart beating in a minute. A normal person at resting has a heart rate of 60-100 beats/minute. People of different age, sex and under different physiological conditions have different heart rates.

The result shows that men in Macao have an average heart rate of 70.3-73.7, while women have an average heart rate of 73.5-71.0 (see table 2-31).

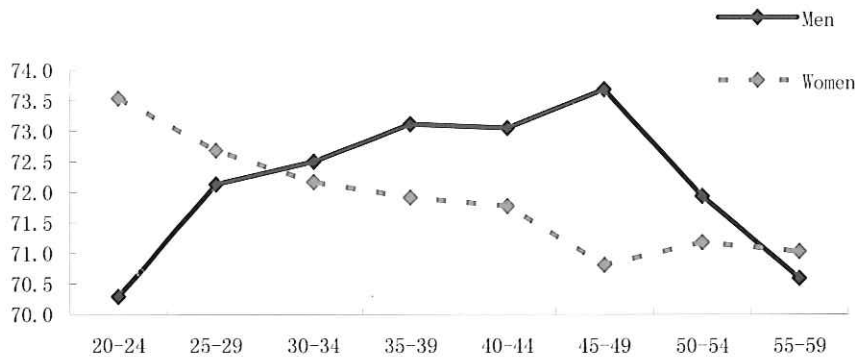
From age 20 to 49, the average heart rate of men increase with the growth of age, while from age 50 to 59, heart rate decreases. Average heart rate of women decreases with increasing age. The changes of heart rate mainly attribute to the decrease of metabolism level.

Table 2-31 Average heart rate of adults in Macao (beats per minute)

| Age | Men |                 | Women |                 |
|-----|-----|-----------------|-------|-----------------|
|     | N   | $\bar{X} \pm S$ | N     | $\bar{X} \pm S$ |
| 20~ | 184 | 70.3 ± 9.9      | 190   | 73.5±8.6        |
| 25~ | 250 | 72.1 ± 9.7      | 351   | 72.7±8.0        |
| 30~ | 270 | 72.5 ± 9.4      | 297   | 72.2±7.8        |
| 35~ | 342 | 73.1 ± 9.6      | 328   | 71.9±8.1        |
| 40~ | 395 | 73.1 ± 9.5      | 313   | 71.8±8.2        |
| 45~ | 297 | 73.7 ± 10.1     | 241   | 70.8±7.7        |
| 50~ | 155 | 71.9 ± 9.0      | 199   | 71.2±8.2        |
| 55~ | 59  | 70.6 ± 9.3      | 90    | 71.0±8.4        |

Before age 30, women have a higher heart rate than men in same age, and after age 30, the heart rate of women is lower than that of men, and the difference increases along with increasing age. The biggest difference of heart rate is at the age of 45-49.

The remarkable difference of heart rate between men and women only appears in two age groups: 20-24 and 45-49. This result is similar to the result of a previous national survey for the staff in Chinese enterprises in 1994. The reason for the result, according to Professor Ji Chengye, mainly attributes to different physiological capacities between men and women in different age stages.



Graph 2-4 Change of heart rate of the adults in Macao

Different jobs have different effect on the physiological capacities and metabolism levels of human body. The result shows that the heart rate of male physical workers is a little bit higher than that of male non physical workers. The heart rate change of male non physical workers is smaller than physical workers along with the growth of age. The result also shows that the sudden decrease of male adults' heart rate after age 50 mentioned above mainly ascribes to physical workers' heart rate change.

The heart rate of female non physical workers is a little higher than that of physical workers, and remarkable difference occurs in 35-44-year-old age group. After age 45, the heart rate of non physical workers has bigger decrease, for example, the heart rate of 45-49-year-old people is 2.3 beats lower than that of 40-44-year-old people (see table 2-32).

Table 2-32 Average heart rates of physical workers and non physical workers in Macao

| Sex   | Age group | Physical workers |                 | non physical workers |                 | Difference | significance |
|-------|-----------|------------------|-----------------|----------------------|-----------------|------------|--------------|
|       |           | N                | $\bar{X} \pm S$ | N                    | $\bar{X} \pm S$ |            |              |
| Men   | 20~       | 99               | 68.9±9.2        | 85                   | 71.8±10.5       | -2.9       | *            |
|       | 25~       | 147              | 72.5±9.9        | 103                  | 71.5±9.3        | 0.9        |              |
|       | 30~       | 119              | 73.1±9.4        | 151                  | 71.9±9.3        | 1.2        |              |
|       | 35~       | 194              | 74.2±9.8        | 148                  | 71.5±8.8        | 2.7        | **           |
|       | 40~       | 279              | 73.6±10.0       | 116                  | 71.7±8.0        | 1.9        |              |
|       | 45~       | 198              | 74.7±10.4       | 99                   | 71.5±8.9        | 3.2        | **           |
|       | 50~       | 92               | 70.9±9.3        | 63                   | 73.3±8.2        | -2.4       |              |
|       | 55~       | 30               | 69.4±10.4       | 29                   | 71.7±8.0        | -2.4       |              |
| Women | 20~       | 83               | 73.9±10.0       | 107                  | 73.2±7.4        | 0.7        |              |
|       | 25~       | 103              | 71.8±7.5        | 248                  | 73.0±8.1        | -1.1       |              |
|       | 30~       | 89               | 71.5±8.1        | 208                  | 72.4±7.6        | -0.8       |              |
|       | 35~       | 123              | 70.7±7.5        | 205                  | 72.6±8.2        | -1.9       | *            |
|       | 40~       | 154              | 70.6±8.4        | 159                  | 72.8±7.8        | -2.2       | *            |
|       | 45~       | 142              | 70.9±7.7        | 99                   | 70.5±7.6        | 0.4        |              |
|       | 50~       | 128              | 71.3±8.4        | 71                   | 70.7±7.6        | 0.6        |              |
|       | 55~       | 71               | 70.3±8.0        | 19                   | 73.4±9.6        | -3.1       |              |

note: \*\* P < 0.01 \* P < 0.05

In general, with the increase of age, the heart rate has a little bit decrease. The heart rate of physical workers is higher than that of non physical workers, especially, the heart rate of male physical workers keeps increasing before age 49 along with the growth in age.

### 2.2.2 Systolic Pressure

Blood pressure refers to the lateral pressure of blood onto the blood vessel wall while it flows inside the blood vessel. When the ventricle contracts, the arterial pressure at the highest value is called systolic pressure. When the ventricle relaxes, the arterial pressure at the lowest value is called diastolic pressure.

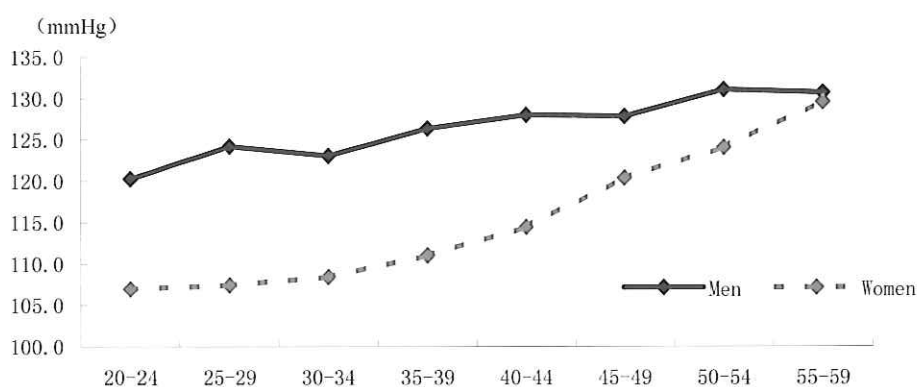
Table 2-33 shows the systolic pressure increases along with the growth in age. An average value of 10.46 mmHg increase occurs from 20-24-year-old age group to 50-59-year-old age group (P<0.01). The result shows that the increase is stable, but only between age groups of 20-24-year-old and 25-29-year-old (P<0.01), 30-34-year-old and 35-39-year-old (P<0.01), and 45-49-year-old and 50-54-year-old (P<0.01), the differences are remarkable. Systolic pressure of men spires with the increase of age.

Wile for female, there is an average increase of 22.7 mmHg (P<0.01) from 20-24-year-old age group to 50-59-year-old age group. Before age 35, there is a smaller change of systolic pressure along with the growth in age, the total change value is 2.6 mmHg. But after age 35, the changes between different age groups increase.

Table 2-33 Average systolic pressure of the adults in Macao (mmHg)

| Age group<br>(year) | Men |                 | Women |                 |
|---------------------|-----|-----------------|-------|-----------------|
|                     | N   | $\bar{X} \pm S$ | N     | $\bar{X} \pm S$ |
| 20~                 | 184 | 120.2±13.1      | 190   | 106.9±9.4       |
| 25~                 | 250 | 124.2±13.4      | 351   | 107.4±10.0      |
| 30~                 | 270 | 123.0±12.8      | 297   | 108.4±12.7      |
| 35~                 | 342 | 126.3±13.9      | 328   | 111.0±13.0      |
| 40~                 | 395 | 128.0±15.8      | 313   | 114.4±13.5      |
| 45~                 | 297 | 127.8±14.9      | 241   | 120.3±16.3      |
| 50~                 | 155 | 131.0±17.3      | 199   | 124.0±18.7      |
| 55~                 | 59  | 130.7±18.6      | 90    | 129.6±19.8      |

Men have a higher systolic pressure than women, but the difference between men and women decrease with increasing age (see graph 2-5). The biggest difference between men and women occurs in 20-24-year-old age group, and the value is 13.3 mmHg. While in 55-59-year-old age group, the difference is not remarkable. Systolic pressures of the adults in Macao increase along with the growth in age, but increase of women is much more quickly in compare to male.



Graph 2-5 Change of systolic pressure of the adults in Macao

Physical workers have a higher systolic pressure than non physical workers. Between age 30 and 49, male physical workers have a remarkable higher systolic pressure than non physical workers, and the value of the difference is 6.0 mmHg. The systolic pressure of physical workers increases along with the growth in age. While non physical workers have a relative stable systolic pressure of 123 mmHg, and a remarkable increase after age 50.

As for female adults, there is a stable increase of systolic pressure of physical workers with the growth of age. While the systolic pressure of white-collar starts increasing after age 35 (see table 2-34).

Table 2-34 Average systolic pressure of physical workers and non physical workers in Macao (mmHg)

| Sex   | Age group (year) | Physical workers |                 | non physical workers |                 | Difference | Significance |
|-------|------------------|------------------|-----------------|----------------------|-----------------|------------|--------------|
|       |                  | N                | $\bar{X} \pm S$ | N                    | $\bar{X} \pm S$ |            |              |
| Men   | 20~              | 99               | 120.5±14.1      | 85                   | 120.0±11.9      | 0.5        |              |
|       | 25~              | 147              | 124.8±14.3      | 103                  | 123.2±12.0      | 1.7        |              |
|       | 30~              | 119              | 125.2±13.4      | 151                  | 121.3±12.1      | 4.0        | **           |
|       | 35~              | 194              | 128.3±14.6      | 148                  | 123.7±12.6      | 4.6        | **           |
|       | 40~              | 279              | 129.5±15.7      | 116                  | 124.2±15.4      | 5.3        | **           |
|       | 45~              | 198              | 129.8±15.2      | 99                   | 123.8±13.7      | 6.0        | **           |
|       | 50~              | 92               | 132.3±18.4      | 63                   | 129.1±15.5      | 3.2        |              |
|       | 55~              | 30               | 131.9±19.9      | 29                   | 129.5±17.5      | 2.4        |              |
| Women | 20~              | 83               | 106.0±9.8       | 107                  | 107.6±9.0       | -1.6       |              |
|       | 25~              | 103              | 107.9±10.2      | 248                  | 107.2±9.9       | 0.7        |              |
|       | 30~              | 89               | 110.0±15.0      | 208                  | 107.7±11.6      | 2.3        |              |
|       | 35~              | 123              | 112.3±13.3      | 205                  | 110.2±12.8      | 2.2        |              |
|       | 40~              | 154              | 116.6±13.6      | 159                  | 112.3±13.2      | 4.2        | **           |
|       | 45~              | 142              | 120.8±16.6      | 99                   | 119.8±15.9      | 1.0        |              |
|       | 50~              | 128              | 124.8±19.0      | 71                   | 122.7±18.0      | 2.1        |              |
|       | 55~              | 71               | 128.9±20.8      | 19                   | 132.1±16.1      | -3.2       |              |

note: \*\* P < 0.01 \* P < 0.05

### 2.2.3 Diastolic pressure

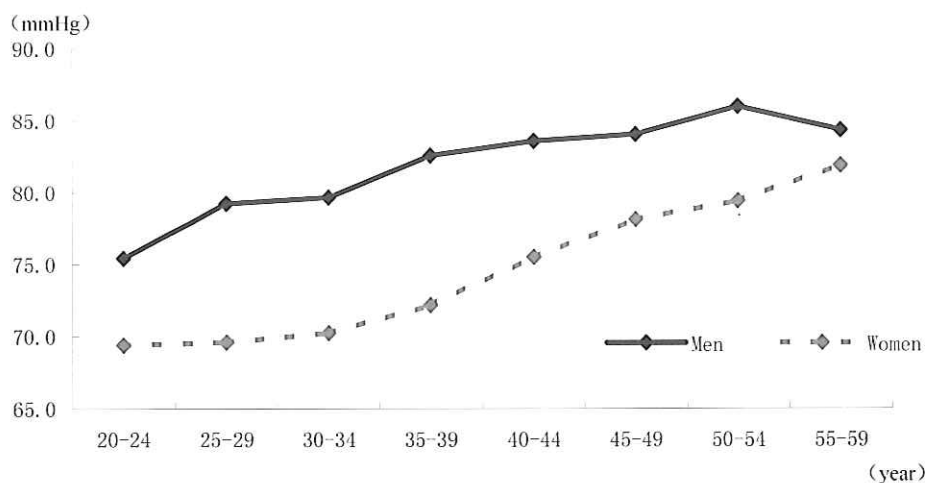
With the growth of age, the diastolic pressure of the adults in Macao increases (see table 2-35). Diastolic pressure of men increases between three age groups, which are: between 20-24 and 25-29, between 30-34 and 35-39, and between 45-49 and 50-54.

As for women, there are no remarkable differences between different age groups before age 35. From age 35 to 49, diastolic pressure increases with the growth of age, and the differences between different age groups are remarkable. While after age 50, the diastolic pressure keeps stable.

Table 2-35 Average diastolic pressure of adults in Macao (mmHg)

| Age group (year) | Men |                 | Women |                 |
|------------------|-----|-----------------|-------|-----------------|
|                  | N   | $\bar{X} \pm S$ | N     | $\bar{X} \pm S$ |
| 20~              | 184 | 75.4±8.2        | 190   | 69.4±8.4        |
| 25~              | 250 | 79.2±9.1        | 351   | 69.5±8.0        |
| 30~              | 270 | 79.6±9.2        | 297   | 70.2±7.9        |
| 35~              | 342 | 82.5±9.3        | 328   | 72.1±9.2        |
| 40~              | 395 | 83.5±9.6        | 313   | 75.5±9.7        |
| 45~              | 297 | 84.0±9.5        | 241   | 78.1±10.6       |
| 50~              | 155 | 85.9±10.4       | 199   | 79.4±10.2       |
| 55~              | 59  | 84.3±9.7        | 90    | 81.8±11.8       |

In each age group, men have a remarkable higher diastolic pressure than women, but with the growth in age, the difference decreases (see graph 2-36).



Graph 2-6 Changes of diastolic pressure of the adults in Macao

In most age groups, the diastolic pressure of physical workers is higher than that of non physical workers. But only in four age groups (three of them are men), remarkable differences were found (see table 2-36).

Table 2-36 Average diastolic pressure of non physical workers and physical workers in Macao (mmHg)

| Sex   | Age group (year) | Physical workers |                 | non physical workers |                 | Difference | Significance |
|-------|------------------|------------------|-----------------|----------------------|-----------------|------------|--------------|
|       |                  | N                | $\bar{X} \pm S$ | N                    | $\bar{X} \pm S$ |            |              |
| Men   | 20~              | 99               | 74.2±8.2        | 85                   | 76.7±8.1        | -2.5       | *            |
|       | 25~              | 147              | 79.2±9.3        | 103                  | 79.1±8.7        | 0.1        |              |
|       | 30~              | 119              | 81.1±9.0        | 151                  | 78.5±9.2        | 2.6        | *            |
|       | 35~              | 194              | 83.6±9.7        | 148                  | 81.1±8.6        | 2.6        | **           |
|       | 40~              | 279              | 83.9±9.9        | 116                  | 82.7±8.8        | 1.2        |              |
|       | 45~              | 198              | 84.2±9.9        | 99                   | 83.6±8.5        | 0.5        |              |
|       | 50~              | 92               | 86.3±10.1       | 63                   | 85.3±10.9       | 1.0        |              |
|       | 55~              | 30               | 83.6±11.3       | 29                   | 85.0±7.9        | -1.4       |              |
| Women | 20~              | 83               | 68.5±8.4        | 107                  | 70.0±8.4        | -1.4       |              |
|       | 25~              | 103              | 70.6±7.9        | 248                  | 69.1±8.0        | 1.4        |              |
|       | 30~              | 89               | 71.0±8.2        | 208                  | 69.9±7.8        | 1.1        |              |
|       | 35~              | 123              | 73.2±9.3        | 205                  | 71.5±9.0        | 1.7        |              |
|       | 40~              | 154              | 77.0±9.1        | 159                  | 74.0±10.0       | 3.0        | **           |
|       | 45~              | 142              | 78.2±10.7       | 99                   | 77.9±10.5       | 0.3        |              |
|       | 50~              | 128              | 80.1±10.5       | 71                   | 78.0±9.6        | 2.1        |              |
|       | 55~              | 71               | 81.1±11.9       | 19                   | 84.5±11.0       | -3.4       |              |

note: \*\* P < 0.01 \* P < 0.05

#### 2.2.4 Pulse Pressure (PP)

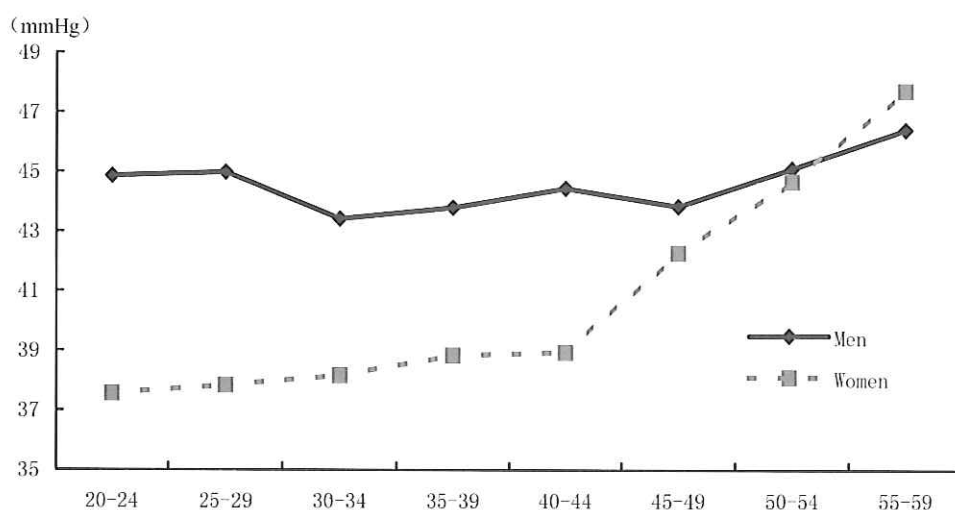
Men have a PP change of 3 mmHg, and no remarkable differences found between different age groups. A larger change of 10.2 mmHg for women, and after age 40, remarkable differences

occur between different age groups. PP of men is larger than that of women, but with the increase of age, the difference between men and women decreases. (see table 2-37)

Table 2-37 Average PP of adults in Macao (mmHg)

| Age group<br>(year) | Men |                 | Women |                 | Difference | Significance |
|---------------------|-----|-----------------|-------|-----------------|------------|--------------|
|                     | N   | $\bar{X} \pm S$ | N     | $\bar{X} \pm S$ |            |              |
| 20~                 | 184 | 44.8±12.3       | 190   | 37.5±8.0        | 7.3        | **           |
| 25~                 | 250 | 44.9±11.7       | 351   | 37.8±9.4        | 7.1        | **           |
| 30~                 | 270 | 43.4±10.9       | 297   | 38.1±11.2       | 5.2        | **           |
| 35~                 | 342 | 43.7±11.4       | 328   | 38.8±10.2       | 4.9        | **           |
| 40~                 | 395 | 44.4±12.0       | 313   | 38.9±10.1       | 5.5        | **           |
| 45~                 | 297 | 43.8±11.5       | 241   | 42.2±11.5       | 1.6        |              |
| 50~                 | 155 | 45.1±13.9       | 199   | 44.6±14.2       | 0.4        |              |
| 55~                 | 59  | 46.4±12.9       | 90    | 47.7±15.3       | -1.3       |              |

note: \*\* P < 0.01 \* P < 0.05



Graph 2-7 Changes of PP of the adults in Macao

**WHO blood pressure standard:**

**High Blood pressure (HBP):**

systolic pressure  $\geq 160$  mmHg or/and diastolic pressure  $\geq 95$  mmHg

**Critical high blood pressure (CHBP):**

140 mmHg  $\leq$  Systolic pressure < 160 mmHg and/or 90 mmHg  $\leq$  diastolic pressure < 95 mmHg;

**Normal blood pressure (NBP):**

Systolic pressure < 140 mmHg and diastolic pressure < 90 mmHg

According to the WHO blood pressure standards, percentages for High blood pressure and Critical high blood pressure increase with the growth in age (see table 2-38). 12.5% men aged 20-24 have an abnormal blood pressure. Only 48.4% men aged 50-54 have a normal blood pressure, while 23.2% men are high blood pressure.

Women have a better result, 89.5% have a normal blood pressure. But, 43.3% women aged 50-59 have an abnormal blood pressure, and this percentage is almost as high as that of men. The result also shows that percentages for high blood pressure and critical blood pressure of physical workers are larger than those of non physical workers (see table 2-39). Although the result of this survey is not the medical diagnosis, it's an important signal for people's health.

Table 2-38 Percentages for different blood pressures in Macao (%)

| Sex   |      | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 | 50-54 | 55-59 | Total |
|-------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Men   | HBP  | 1.1   | 3.6   | 4.1   | 9.9   | 14.7  | 14.8  | 23.2  | 15.3  | 10.4  |
|       | CHBP | 11.4  | 20.0  | 18.1  | 21.3  | 22.3  | 28.3  | 28.4  | 33.9  | 22.0  |
|       | NBP  | 87.5  | 76.4  | 77.8  | 68.7  | 63.0  | 56.9  | 48.4  | 50.8  | 67.6  |
| Women | HBP  | 1.1   | 0.3   | 1.3   | 1.8   | 3.2   | 7.5   | 8.0   | 18.9  | 3.7   |
|       | CHBP |       | 0.9   | 1.7   | 3.4   | 7.0   | 13.3  | 20.6  | 24.4  | 6.8   |
|       | NBP  | 98.9  | 98.9  | 97.0  | 94.8  | 89.8  | 79.3  | 71.4  | 56.7  | 89.5  |

Table 2-39 Different blood pressures percentages for non physical workers and physical workers (%)

| Sex   | Blood Pressure | Physical workers | Brainworkers |
|-------|----------------|------------------|--------------|
| Men   | HBP            | 12.6             | 7.2          |
|       | CHBP           | 23.7             | 19.4         |
|       | NBP            | 63.6             | 73.4         |
| Women | HBP            | 5.3              | 2.4          |
|       | CHBP           | 10.2             | 4.0          |
|       | NBP            | 84.5             | 93.5         |

### 2.2.5 Vital capacity

The vital capacity of the adults in Macao decreases along with the growth in age (see table 2-40, graph 2-8).

The vital capacity of men decreases around 900 ml, from its maximum value of 3972.9 ml to the minimal value of 3036.3 ml. From 20 to 39, the vital capacity remarkably decreases along with the growth in age. While from age 40 to 54, no notable changes for vital capacity.

The vital capacity of women also decreases with increasing age, from 2616.9 ml to 1940.3 ml. No changes occur between age 20 and 34, but beginning from age 35, the vital capacity remarkably decreases.

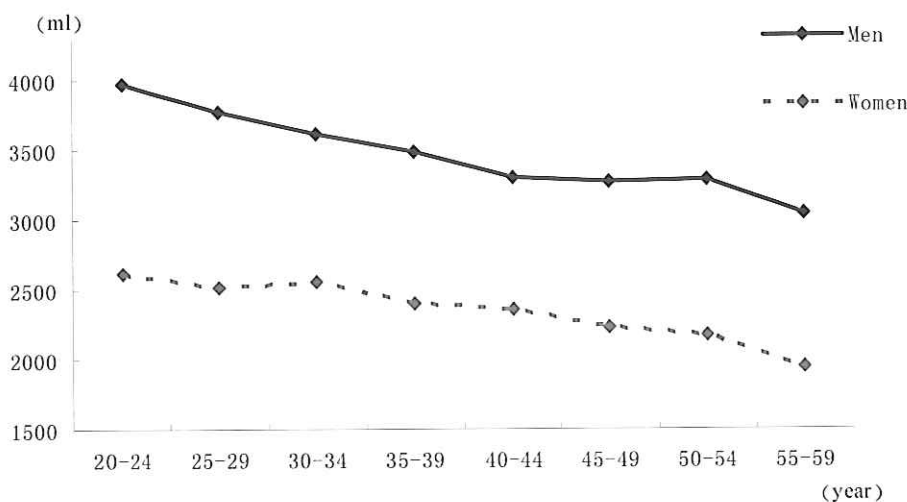
Table 2-40 Average vital capacity of adults in Macao (ml)

| Age group<br>(year) | Men |                 | Women |                 | Difference | Significance |
|---------------------|-----|-----------------|-------|-----------------|------------|--------------|
|                     | N   | $\bar{X} \pm S$ | N     | $\bar{X} \pm S$ |            |              |
| 20~                 | 184 | 3972.9±728.9    | 190   | 2616.9±535.5    | 1356.0     | **           |
| 25~                 | 250 | 3767.8±777.4    | 351   | 2512.5±539.6    | 1255.3     | **           |
| 30~                 | 270 | 3619.9±789.0    | 297   | 2550.3±652.8    | 1069.5     | **           |
| 35~                 | 342 | 3479.0±739.4    | 328   | 2392.9±579.1    | 1086.2     | **           |
| 40~                 | 395 | 3296.7±690.1    | 313   | 2356.6±545.3    | 940.1      | **           |
| 45~                 | 297 | 3267.9±659.6    | 240   | 2230.4±538.8    | 1037.5     | **           |
| 50~                 | 155 | 3292.1±864.2    | 199   | 2169.9±553.1    | 1122.2     | **           |
| 55~                 | 59  | 3036.3±677.4    | 90    | 1940.3±654.7    | 1096.0     | **           |

note: \*\* P < 0.01 \* P < 0.05



The average vital capacity of men is greater than that of women, the greatest difference value of 1356 ml occurs in the age group of 20-24-year-old. The vital capacity of men has a larger decrease degree than that of women, and along with the growth of age, the difference value decreases. Although the vital capacity of women is smaller than that of men, it has a later decrease trend. Beginning from age 20, men's vital capacity starts decreasing, but women's vital capacity begins decreasing at the age of 35.



Graph 2-8 Changes of vital capacity of the adults in Macao

The vital capacity of non physical workers is greater than that of physical workers, and the difference gets remarkable from age 30 to 49 (see table 2-41). Before age 30, the vital capacity of female physical workers is greater than that of female non physical workers. After 30, the vital capacity of female non physical workers is greater than that of female physical workers, but only in age group of 40-44-year-old, remarkable difference could be found.

Table 2-41 Average vital capacities of non physical workers and physical workers in Macao (ml)

| Sex   | Age group (year) | Physical workers |                 | non physical workers |                 | Difference | Significance |
|-------|------------------|------------------|-----------------|----------------------|-----------------|------------|--------------|
|       |                  | N                | $\bar{X} \pm S$ | N                    | $\bar{X} \pm S$ |            |              |
| Men   | 20~              | 99               | 3918.8±700.9    | 85                   | 4035.9±759.6    | -117.0     |              |
|       | 25~              | 147              | 3750.1±774.5    | 103                  | 3793.0±784.6    | -42.9      |              |
|       | 30~              | 119              | 3442.4±716.7    | 151                  | 3759.7±817.1    | -317.4     | **           |
|       | 35~              | 194              | 3338.1±596.3    | 148                  | 3663.8±860.7    | -325.7     | **           |
|       | 40~              | 279              | 3249.4±644.5    | 116                  | 3410.5±780.3    | -161.0     | *            |
|       | 45~              | 198              | 3206.4±659.5    | 99                   | 3390.9±645.6    | -184.4     | *            |
|       | 50~              | 92               | 3273.8±921.9    | 63                   | 3318.9±778.6    | -45.2      |              |
|       | 55~              | 30               | 2924.3±723.6    | 29                   | 3152.2±617.3    | -227.9     |              |
| Women | 20~              | 83               | 2701.3±543.6    | 107                  | 2551.4±522.3    | 149.9      |              |
|       | 25~              | 103              | 2568.2±496.4    | 248                  | 2489.4±555.9    | 78.8       |              |
|       | 30~              | 89               | 2470.7±637.0    | 208                  | 2584.4±658.0    | -113.7     |              |
|       | 35~              | 123              | 2354.0±509.8    | 205                  | 2416.2±617.0    | -62.3      |              |
|       | 40~              | 154              | 2284.4±519.0    | 159                  | 2426.6±562.5    | -142.2     | *            |
|       | 45~              | 141              | 2201.4±523.3    | 99                   | 2271.8±560.1    | -70.4      |              |
|       | 50~              | 128              | 2117.3±541.1    | 71                   | 2264.9±565.6    | -147.6     |              |
|       | 55~              | 71               | 1900.9±593.4    | 19                   | 2087.6±849.2    | -186.6     |              |

note: \*\* P < 0.01 \* P < 0.05

It can be seen from the analysis mentioned above we can see the physiological capacity of the adults in Macao has some traits as follows:

With age increasing, the heart rate and vital capacity decrease, while the blood pressure (systolic pressure and diastolic pressure) increases, and the changes are different in different age groups.

Also, participants in different occupations (non physical workers and physical workers) and different genders have different physiological capacities. For example, the vital capacity of men is obviously greater than that of women, but the vital capacity of men has a faster decrease speed than that of women. The systolic pressure of women has a quick increase than that of men along with the growth in age. No matter women or men, non physical workers have a better physiological capacity than physical workers.

## 2.3 Physical Capacity

### 2.3.1 Strength

In this survey, grip strength, back strength, pull-ups (men only), sit-ups (women only) and vertical jump are the indices of strength for the adults under the age of 35, while for those above the age of 40, grip strength is the only index of strength.

As the table 2-42 shows: grip strength increases with the growth of age, after reaching the maximum value, it begins decreasing. The maximum grip strength occurs at the age of 35-39, and the minimal value occurs in 55-59-year-old age group. The difference between the maximum and minimal values is 6.5 kg for men, and 3.2 kg for women.

Table 2-42 Average grip strength, back strength, pull-ups and sit-ups

| Sex   | Age group (year) | N   | Grip strength (kg) | Back strength (kg) | Vertical jump (cm) | Pull-ups (Sit-ups) (times) |
|-------|------------------|-----|--------------------|--------------------|--------------------|----------------------------|
|       |                  |     | $\bar{X} \pm s$    | $\bar{X} \pm s$    | $\bar{X} \pm s$    | $\bar{X} \pm s$            |
| Men   | 20~              | 184 | 41.0±8.0           | 133.6±25.3         | 41.2±7.9           | 34.4±15.2                  |
|       | 25~              | 245 | 44.0±8.1           | 126.7±29.7         | 37.1±7.1           | 27.4±13.6                  |
|       | 30~              | 263 | 44.6±7.7           | 124.9±26.8         | 34.1±7.2           | 23.0±12.0                  |
|       | 35~              | 326 | 45.2±7.7           | 126.6±27.0         | 33.0±6.7           | 21.7±11.0                  |
|       | 40~              | 395 | 44.8±7.8           | —                  | —                  | —                          |
|       | 45~              | 297 | 43.4±7.4           | —                  | —                  | —                          |
|       | 50~              | 155 | 41.0±7.7           | —                  | —                  | —                          |
|       | 55~              | 59  | 38.7±7.3           | —                  | —                  | —                          |
| Women | 20~              | 190 | 24.3±4.8           | 67.1±20.0          | 24.6±4.9           | 26.3±9.9                   |
|       | 25~              | 351 | 24.5±4.7           | 64.6±17.2          | 23.9±5.1           | 23.4±8.8                   |
|       | 30~              | 297 | 25.0±4.7           | 66.3±17.3          | 22.3±3.9           | 20.8±9.0                   |
|       | 35~              | 328 | 25.3±4.7           | 66.9±16.9          | 21.0±4.9           | 17.5±9.0                   |
|       | 40~              | 313 | 25.0±4.8           | —                  | —                  | —                          |
|       | 45~              | 241 | 24.4±5.0           | —                  | —                  | —                          |
|       | 50~              | 199 | 23.3±5.2           | —                  | —                  | —                          |
|       | 55~              | 90  | 22.1±5.3           | —                  | —                  | —                          |

The back strength, vertical jump, pull-ups (male only), and sit-ups (female only) decrease with

increasing age, the largest values are in the age group of 20-24-year-old, beginning from the age group of 25-29-year-old, the values decrease remarkably.

The strength of men is greater than that of women, and it also has a larger decrease. Take back strength for example, men have a decrease percentage of 7.0%, while women's decreases percentage is 4.0%.

The grip strength of male physical workers is obviously greater than that of non physical workers, but non physical workers have a little bigger leg strength than physical workers. As for back strength and put-ups (sit-ups for women), no remarkable difference found between physical workers and non physical workers (see table 2-43~46).

As for women, the leg strength of non physical workers is larger than that of physical workers, while no remarkable differences of other indices found between non physical workers and physical workers.

The reason for non physical workers' larger leg strength is possibly attribute to non physical workers' more exercises skills accepted during education. It also reminds several problems existing in physical workers' daily exercises and exercises. Because physical work does not mean exercises and exercise, it maybe good for maintaining strength, but not enough for improving quick work capacity.

Table 2-43 Average grip strength of physical workers and non physical workers in Macao (kg)

| Sex   | Age group (year) | Physical workers |                 | Brainworkers |                 | Difference | Significance |
|-------|------------------|------------------|-----------------|--------------|-----------------|------------|--------------|
|       |                  | N                | $\bar{X} \pm s$ | N            | $\bar{X} \pm s$ |            |              |
| Men   | 20~              | 99               | 38.4±7.9        | 85           | 43.9±7.1        | -5.5       | **           |
|       | 25~              | 147              | 44.2±8.6        | 103          | 43.7±7.5        | 0.5        |              |
|       | 30~              | 119              | 45.9±7.9        | 151          | 43.5±7.4        | 2.3        | **           |
|       | 35~              | 194              | 46.3±7.4        | 148          | 43.9±8.0        | 2.4        | **           |
|       | 40~              | 279              | 45.4±7.9        | 116          | 43.1±7.1        | 2.3        | **           |
|       | 45~              | 198              | 44.3±7.5        | 99           | 41.7±6.8        | 2.6        | **           |
|       | 50~              | 92               | 40.4±8.2        | 63           | 41.9±6.8        | -1.5       |              |
|       | 55~              | 30               | 38.0±7.7        | 29           | 39.5±6.8        | -1.5       |              |
| Women | 20~              | 83               | 24.0±5.2        | 107          | 24.6±4.4        | -0.6       |              |
|       | 25~              | 103              | 25.2±5.2        | 248          | 24.3±4.5        | 0.9        |              |
|       | 30~              | 89               | 25.5±4.7        | 208          | 24.8±4.7        | 0.7        |              |
|       | 35~              | 123              | 26.1±4.2        | 205          | 24.8±5.0        | 1.3        | *            |
|       | 40~              | 154              | 25.1±4.8        | 159          | 24.8±4.7        | 0.3        |              |
|       | 45~              | 142              | 24.0±5.1        | 99           | 24.8±4.7        | -0.8       |              |
|       | 50~              | 128              | 23.5±5.4        | 71           | 23.1±5.1        | 0.5        |              |
|       | 55~              | 71               | 22.2±5.5        | 19           | 21.9±4.4        | 0.3        |              |

note: \*\* P < 0.01 \* P < 0.05

Table 2-44 Average back strength of physical workers and non physical workers in Macao (kg)

| Sex   | Age group (year) | Physical workers |                 | non physical workers |                 | Difference | Significance |
|-------|------------------|------------------|-----------------|----------------------|-----------------|------------|--------------|
|       |                  | N                | $\bar{X} \pm S$ | N                    | $\bar{X} \pm S$ |            |              |
| Men   | 20~              | 99               | 130.9±21.8      | 85                   | 136.8±28.7      | -5.9       |              |
|       | 25~              | 144              | 129.1±29.1      | 100                  | 123.2±30.3      | 5.9        |              |
|       | 30~              | 115              | 127.0±25.0      | 148                  | 123.2±28.1      | 3.9        |              |
|       | 35~              | 184              | 127.9±26.8      | 142                  | 124.8±27.2      | 3.0        |              |
| Women | 20~              | 83               | 69.9±23.4       | 105                  | 65.0±16.6       | 4.9        |              |
|       | 25~              | 103              | 67.1±19.4       | 244                  | 63.5±16.1       | 3.6        |              |
|       | 30~              | 89               | 64.6±15.3       | 204                  | 67.1±18.0       | -2.5       |              |
|       | 35~              | 112              | 68.3±18.1       | 195                  | 66.1±16.1       | 2.1        |              |

\*\* P &lt; 0.01 \* P &lt; 0.05

Table 2-45 Average vertical jump values of physical workers and non physical workers in Macao (cm)

| Sex   | Age group (year) | Physical workers |                 | non physical workers |                 | Difference | Significance |
|-------|------------------|------------------|-----------------|----------------------|-----------------|------------|--------------|
|       |                  | N                | $\bar{X} \pm S$ | N                    | $\bar{X} \pm S$ |            |              |
| Men   | 20~              | 99               | 41.2±7.0        | 84                   | 41.2±8.8        | 0.1        |              |
|       | 25~              | 145              | 36.3±6.6        | 100                  | 38.3±7.7        | -2.0       | *            |
|       | 30~              | 115              | 31.6±5.9        | 148                  | 36.0±7.6        | -4.4       | **           |
|       | 35~              | 183              | 31.4±6.3        | 142                  | 35.0±6.6        | -3.6       | **           |
| Women | 20~              | 83               | 25.9±5.5        | 103                  | 23.6±4.1        | 2.3        | **           |
|       | 25~              | 103              | 23.4±4.6        | 243                  | 24.1±5.3        | -0.8       |              |
|       | 30~              | 89               | 21.1±3.7        | 203                  | 22.9±3.9        | -1.8       | **           |
|       | 35~              | 112              | 19.9±3.9        | 192                  | 21.7±5.3        | -1.8       | **           |

note: \*\* P &lt; 0.01 \* P &lt; 0.05

Table 2-46 Average pull-ups (for women: sit-ups) of physical workers and non physical workers in Macao

| Sex   | Age group (year) | Physical workers |                 | non physical workers |                 | Difference | Significance |
|-------|------------------|------------------|-----------------|----------------------|-----------------|------------|--------------|
|       |                  | N                | $\bar{X} \pm S$ | N                    | $\bar{X} \pm S$ |            |              |
| Men   | 20~              | 99               | 39.2±16.6       | 84                   | 28.7±11.0       | 10.5       | **           |
|       | 25~              | 143              | 28.3±14.5       | 100                  | 26.0±12.3       | 2.4        |              |
|       | 30~              | 115              | 23.3±13.0       | 144                  | 22.8±11.2       | 0.4        |              |
|       | 35~              | 180              | 21.4±10.7       | 139                  | 22.1±11.4       | -0.7       |              |
| Women | 20~              | 82               | 27.7±12.1       | 101                  | 25.1±7.5        | 2.7        |              |
|       | 25~              | 99               | 22.3±8.3        | 239                  | 23.9±9.0        | -1.5       |              |
|       | 30~              | 78               | 17.7±8.1        | 196                  | 22.0±9.1        | -4.3       | **           |
|       | 35~              | 88               | 16.2±11.6       | 172                  | 18.2±7.3        | -1.9       |              |

note: \*\* P &lt; 0.01 \* P &lt; 0.05

### 2.3.2 10m×4 Shuttle Run

The result shows (see table 2-47) that the time of 10m×4 shuttle run remarkably increases with the growth of age ( $p < 0.01$ ). The time increased for men is 0.8 second, while for women is 1.0 second. Men have a shorter time than women, which means men are more agile than female. The average difference value between men and women is 2.2-2.6 seconds, and the difference keeps stable with increasing age.

Table 2-47 The average time of 10m×4 shuttle run of adults in Macao (second)

| Age group (year) | Physical workers |                 | non physical workers |                 | Difference | Significance |
|------------------|------------------|-----------------|----------------------|-----------------|------------|--------------|
|                  | N                | $\bar{X} \pm S$ | N                    | $\bar{X} \pm S$ |            |              |
| 20~              | 183              | 11.3± 1.0       | 187                  | 13.7± 1.2       | -2.5       | **           |
| 25~              | 245              | 11.6± 1.0       | 346                  | 13.8± 1.3       | -2.2       | **           |
| 30~              | 263              | 11.9± 1.1       | 293                  | 14.2± 1.3       | -2.3       | **           |
| 35~              | 325              | 12.1± 1.1       | 306                  | 14.7± 1.3       | -2.6       | **           |

note: \*\*  $P < 0.01$  \*  $P < 0.05$

Comparative analysis shows that non physical workers have a shorter 10m×4 shuttle run time than physical workers, which suggests that non physical workers are more agile than physical workers.

Table 2-48 The average time of 10m×4 shuttle of physical workers and non physical workers in Macao (second)

| Sex   | Age group (year) | Physical workers |                 | non physical workers |                 | Difference | Significance |
|-------|------------------|------------------|-----------------|----------------------|-----------------|------------|--------------|
|       |                  | N                | $\bar{X} \pm S$ | N                    | $\bar{X} \pm S$ |            |              |
| Men   | 20~              | 99               | 11.3± 0.9       | 84                   | 11.2± 1.1       | 0.1        |              |
|       | 25~              | 145              | 11.7± 1.1       | 100                  | 11.4± 0.8       | 0.3        | *            |
|       | 30~              | 115              | 12.1± 1.2       | 148                  | 11.8± 0.9       | 0.4        | **           |
|       | 35~              | 183              | 12.3± 1.1       | 142                  | 12.0± 1.0       | 0.3        | **           |
| Women | 20~              | 83               | 13.6± 1.3       | 104                  | 13.8± 1.2       | -0.2       |              |
|       | 25~              | 102              | 13.9± 1.6       | 244                  | 13.7± 1.1       | 0.2        |              |
|       | 30~              | 89               | 14.7± 1.6       | 204                  | 14.0± 1.1       | 0.7        | **           |
|       | 35~              | 112              | 14.9± 1.4       | 194                  | 14.6± 1.3       | 0.3        | *            |

note: \*\*  $P < 0.01$  \*  $P < 0.05$

### 2.3.3 Response Ability

In this survey, response time was used to test response ability of the adults in Macao. Table 2-49 shows that men's average response time are 0.39-0.43 seconds, and it increases with the growth of age, but no remarkable difference found between different age groups. While for women, the average response time are 0.41-0.47 seconds, it also increases along with the growth in age. After age 35, the response time decreases remarkably with increasing age.

Table 2-49 The average response time of adults in Macao (second)

| Age group<br>(year) | Men |                 | Women |                 | Difference | Significance |
|---------------------|-----|-----------------|-------|-----------------|------------|--------------|
|                     | N   | $\bar{X} \pm S$ | N     | $\bar{X} \pm S$ |            |              |
| 20~                 | 184 | 0.39± 0.044     | 190   | 0.41± 0.043     | -0.026     | **           |
| 25~                 | 250 | 0.39± 0.039     | 351   | 0.41± 0.039     | -0.017     | **           |
| 30~                 | 270 | 0.39± 0.044     | 297   | 0.42± 0.040     | -0.022     | **           |
| 35~                 | 342 | 0.40± 0.047     | 328   | 0.43± 0.049     | -0.028     | **           |
| 40~                 | 392 | 0.40± 0.045     | 312   | 0.44± 0.056     | -0.033     | **           |
| 45~                 | 293 | 0.41± 0.040     | 241   | 0.45± 0.060     | -0.041     | **           |
| 50~                 | 155 | 0.43± 0.063     | 197   | 0.46± 0.068     | -0.037     | **           |
| 55~                 | 59  | 0.43± 0.048     | 90    | 0.47± 0.071     | -0.040     | **           |

note: \*\* P < 0.01 \* P < 0.05

Men have a better response ability than women, and the difference increases along with the growth of age. Small difference found between different occupation holders (see table 2-50).

Table 2-50 Average response time of physical workers and non physical workers in Macao (second)

| Sex   | Age group<br>(year) | Physical workers |                 | non physical workers |                 | Difference | Significance |
|-------|---------------------|------------------|-----------------|----------------------|-----------------|------------|--------------|
|       |                     | N                | $\bar{X} \pm S$ | N                    | $\bar{X} \pm S$ |            |              |
| Men   | 20~                 | 99               | 0.39± 0.037     | 85                   | 0.39± 0.052     | 0.002      |              |
|       | 25~                 | 147              | 0.39± 0.039     | 103                  | 0.40± 0.040     | -0.004     |              |
|       | 30~                 | 119              | 0.40± 0.050     | 151                  | 0.39± 0.038     | 0.012      | *            |
|       | 35~                 | 194              | 0.40± 0.051     | 148                  | 0.40± 0.042     | -0.003     |              |
|       | 40~                 | 277              | 0.40± 0.047     | 115                  | 0.40± 0.042     | -0.001     |              |
|       | 45~                 | 195              | 0.40± 0.041     | 98                   | 0.41± 0.039     | -0.005     |              |
|       | 50~                 | 92               | 0.44± 0.070     | 63                   | 0.41± 0.048     | 0.029      | **           |
|       | 55~                 | 30               | 0.43± 0.048     | 29                   | 0.42± 0.048     | 0.003      |              |
| Women | 20~                 | 83               | 0.42± 0.049     | 107                  | 0.41± 0.036     | 0.017      | **           |
|       | 25~                 | 103              | 0.41± 0.043     | 248                  | 0.41± 0.037     | 0.004      |              |
|       | 30~                 | 89               | 0.42± 0.043     | 208                  | 0.41± 0.038     | 0.004      |              |
|       | 35~                 | 123              | 0.44± 0.052     | 205                  | 0.42± 0.045     | 0.025      | **           |
|       | 40~                 | 154              | 0.45± 0.066     | 158                  | 0.42± 0.042     | 0.025      | **           |
|       | 45~                 | 142              | 0.45± 0.065     | 99                   | 0.44± 0.052     | 0.014      |              |
|       | 50~                 | 126              | 0.47± 0.068     | 71                   | 0.46± 0.068     | 0.008      |              |
|       | 55~                 | 71               | 0.47± 0.076     | 19                   | 0.45± 0.04      | 0.026      |              |

note: \*\* P < 0.01 \* P < 0.05

#### 2.3.4 Flexibility

In this survey, the sit-and-reach test was used to test the flexibility of the adults in Macao. Table 2-51 shows that with the growth of age, men's sit-and-reach decreases, men aged 20-24 have the best flexibility, the result of sit-and-reach for men aged 25-44 is smaller than that of men aged 20-24, but no remarkable difference found. Beginning from age 45, the speed of decrease gets faster.

As for women, no remarkable differences found between different age groups, which means age has little effect on women's flexibility. Compared with men, women have a better flexibility,

and the difference increases along with the growth of age.

Table 2-51 The average sit-and-reach and of adults in Macao (cm)

| Age group<br>(year) | Men |                 | Women |                 | Difference | Significance |
|---------------------|-----|-----------------|-------|-----------------|------------|--------------|
|                     | N   | $\bar{X} \pm S$ | N     | $\bar{X} \pm S$ |            |              |
| 20~                 | 184 | 7.0± 9.1        | 188   | 7.2± 8.1        | -0.3       |              |
| 25~                 | 247 | 4.7± 8.8        | 347   | 6.2± 9.3        | -1.5       | *            |
| 30~                 | 267 | 4.5± 8.5        | 292   | 6.7± 8.3        | -2.2       | **           |
| 35~                 | 339 | 4.1± 8.7        | 324   | 6.5± 7.5        | -2.4       | **           |
| 40~                 | 389 | 4.3± 8.1        | 308   | 6.3± 8.2        | -2.0       | **           |
| 45~                 | 293 | 3.7± 8.3        | 239   | 6.5± 7.9        | -2.9       | **           |
| 50~                 | 153 | 2.1± 8.7        | 195   | 6.6± 8.2        | -4.4       | **           |
| 55~                 | 58  | 1.0± 8.3        | 90    | 7.3± 7.9        | -6.3       | **           |

note: \*\* P < 0.01 \* P < 0.05

Occupation also has little effect on adults' flexibility. Table 2-52 shows: the remarkable differences in different occupations only occur in the age groups of 25-29-year-old, 45-49-year-old and 50-54-year-old.

Table 2-52 The average sit-and-reach of physical workers and non physical workers in Macao (cm)

| Sex   | Age group<br>(year) | Physical workers |                 | non physical<br>workers |                 | Difference | Significance |
|-------|---------------------|------------------|-----------------|-------------------------|-----------------|------------|--------------|
|       |                     | N                | $\bar{X} \pm S$ | N                       | $\bar{X} \pm S$ |            |              |
| Men   | 20~                 | 99               | 8.0± 9.1        | 85                      | 5.8± 9.0        | 2.2        |              |
|       | 25~                 | 146              | 5.7± 8.8        | 101                     | 3.3± 8.5        | 2.3        | *            |
|       | 30~                 | 119              | 5.4± 8.6        | 148                     | 3.8± 8.3        | 1.6        |              |
|       | 35~                 | 192              | 4.5± 9.1        | 147                     | 3.6± 8.1        | 0.9        |              |
|       | 40~                 | 275              | 4.5± 8.0        | 114                     | 3.6± 8.3        | 0.9        |              |
|       | 45~                 | 195              | 4.3± 8.2        | 98                      | 2.3± 8.4        | 2.0        | *            |
|       | 50~                 | 90               | 3.5± 8.5        | 63                      | 0.1± 8.5        | 3.4        | *            |
|       | 55~                 | 30               | 1.7± 8.1        | 28                      | 0.2± 8.5        | 1.5        |              |
| Women | 20~                 | 83               | 7.3± 8.1        | 105                     | 7.2± 8.1        | 0.1        |              |
|       | 25~                 | 103              | 5.7± 8.8        | 244                     | 6.4± 9.6        | -0.7       |              |
|       | 30~                 | 87               | 6.8± 9.2        | 205                     | 6.7± 7.9        | 0.1        |              |
|       | 35~                 | 122              | 5.6± 6.6        | 202                     | 7.0± 7.9        | -1.4       |              |
|       | 40~                 | 152              | 6.1± 8.2        | 156                     | 6.5± 8.2        | -0.4       |              |
|       | 45~                 | 140              | 6.7± 8.5        | 99                      | 6.2± 7.2        | 0.6        |              |
|       | 50~                 | 126              | 6.9± 7.7        | 69                      | 6.0± 9.1        | 0.8        |              |
|       | 55~                 | 71               | 7.2± 8.1        | 19                      | 7.5± 7.0        | -0.3       |              |

note: \*\* P < 0.01 \* P < 0.05

### 2.3.5 Balance ability

One Foot Stand with Eyes Closed (**OFSEC**) was used in this survey to test the balance ability. The time of OFSEC of men, from the age 20 to 59, decreases from 61.2 seconds to 21.2 seconds; while the time of OFSEC of women decreases from 61.6 seconds to 16.5 seconds (see table 2-52). From age 20 to

34, the time of OFSEC has a rapid decrease of 15.7 seconds, and no remarkable changes found from age 35 to 49. After age 50, there is another rapid decrease of 13 seconds. The results suggest that with increasing age, the balance ability decreases. Remarkable difference between men and women occurs only in the age group of 25-29.

Table 2-53 The average time of OFSEC of adults in Macao (second)

| Age group<br>(year) | Men |                 | Women |                 | Difference | Significance |
|---------------------|-----|-----------------|-------|-----------------|------------|--------------|
|                     | N   | $\bar{X} \pm S$ | N     | $\bar{X} \pm S$ |            |              |
| 20~                 | 183 | 61.2± 71.4      | 190   | 56.0± 56.3      | 5.2        | *            |
| 25~                 | 250 | 50.3± 54.0      | 351   | 61.6± 71.7      | -11.3      |              |
| 30~                 | 270 | 45.5± 55.5      | 297   | 46.4± 49.7      | -0.9       |              |
| 35~                 | 341 | 34.8± 34.9      | 328   | 39.1± 40.0      | -4.3       |              |
| 40~                 | 392 | 40.8± 57.0      | 310   | 33.9± 44.3      | 6.8        |              |
| 45~                 | 293 | 34.3± 57.8      | 241   | 30.6± 36.4      | 3.7        |              |
| 50~                 | 155 | 23.1± 22.4      | 197   | 25.8± 43.5      | -2.7       |              |
| 55~                 | 59  | 21.2± 23.2      | 90    | 16.5± 16.3      | 4.7        |              |

note: \*\* P < 0.01 \* P < 0.05

Comparative analysis between non physical workers and physical workers shows that, there are remarkable differences in the age group of 30-34 (men), 45-49 and 50-54(women). The result suggests that occupation has no obvious effect on the balance ability of the adults in Macao (see table 2-54).

Table2-54 The average time of OFSEC of physical workers and brainworkers in Macao (second)

| Sex   | Age group<br>(year) | Physical workers |                 | non physical workers |                 | Difference | significance |
|-------|---------------------|------------------|-----------------|----------------------|-----------------|------------|--------------|
|       |                     | N                | $\bar{X} \pm S$ | N                    | $\bar{X} \pm S$ |            |              |
| Men   | 20~                 | 99               | 64.6± 71.9      | 84                   | 57.3± 71.0      | 7.3        | **           |
|       | 25~                 | 147              | 47.5± 53.4      | 103                  | 54.3± 54.8      | -6.8       |              |
|       | 30~                 | 119              | 35.0± 39.8      | 151                  | 53.8± 64.3      | -18.8      |              |
|       | 35~                 | 193              | 33.3± 35.4      | 148                  | 36.8± 34.3      | -3.6       |              |
|       | 40~                 | 277              | 39.0± 59.0      | 115                  | 44.9± 51.8      | -5.8       |              |
|       | 45~                 | 195              | 35.0± 51.5      | 98                   | 33.0± 69.0      | 1.9        |              |
|       | 50~                 | 92               | 22.2± 21.5      | 63                   | 24.5± 23.7      | -2.2       |              |
|       | 55~                 | 30               | 20.2± 20.3      | 29                   | 22.2± 26.2      | -2.0       |              |
| Women | 20~                 | 83               | 64.6± 64.8      | 107                  | 49.3± 48.0      | 15.3       | **           |
|       | 25~                 | 103              | 56.0± 63.2      | 248                  | 63.9± 75.0      | -7.9       |              |
|       | 30~                 | 89               | 40.3± 39.7      | 208                  | 49.0± 53.3      | -8.7       |              |
|       | 35~                 | 123              | 40.2± 45.5      | 205                  | 38.5± 36.4      | 1.7        |              |
|       | 40~                 | 153              | 30.7± 32.6      | 157                  | 37.1± 53.2      | -6.3       |              |
|       | 45~                 | 142              | 25.8± 24.8      | 99                   | 37.5± 47.8      | -11.7      |              |
|       | 50~                 | 127              | 19.6± 18.4      | 70                   | 37.0± 67.6      | -17.4      |              |
|       | 55~                 | 71               | 17.5± 17.8      | 19                   | 12.5± 8.1       | 5.1        |              |

Note: \*\* P < 0.01 \* P < 0.05

## 2.4 Blood Test

### a. TCH

Before age 40, the TCH of men increases with the growth of age. After age 40, no remarkable differences found between different age groups.

For women, no remarkable differences found between different age groups. Compared with



men, women aged 30-44 have remarkable lower TCH, no other remarkable differences found between men and women in other ages (see table 2-55).

Table 2-55 Average TCH of adults in Macao (mmol/L)

| Age group | Men |           |       | Women |           |       | Difference | Sufficiency |
|-----------|-----|-----------|-------|-------|-----------|-------|------------|-------------|
|           | N   | $\bar{X}$ | SD    | N     | $\bar{X}$ | SD    |            |             |
| 20~       | 81  | 4.781     | 0.956 | 116   | 4.881     | 0.852 | -0.100     |             |
| 25~       | 153 | 5.120     | 1.104 | 239   | 4.988     | 0.790 | 0.131      |             |
| 30~       | 193 | 5.489     | 1.047 | 212   | 5.036     | 0.958 | 0.453      | *           |
| 35~       | 240 | 5.674     | 1.009 | 254   | 5.151     | 0.982 | 0.522      | *           |
| 40~       | 298 | 5.725     | 1.038 | 243   | 5.348     | 0.977 | 0.377      | *           |
| 45~       | 222 | 5.764     | 1.018 | 189   | 5.636     | 1.031 | 0.128      |             |
| 50~       | 118 | 5.956     | 0.964 | 158   | 6.176     | 1.109 | -0.220     |             |

Compared with women, men aged 20-49 have a larger percentage of high TCH. With the growth of age, the percentage of high TCH increases (see 2-56).

Table 2-56 TCH categories for adults in Macao (%)

|       |            | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 | 50-54 |
|-------|------------|-------|-------|-------|-------|-------|-------|-------|
| Men   | Low TCH    | 2.5   | 2.0   | 0     | 0     | 0.4   | 0.5   | 0     |
|       | Normal TCH | 86.3  | 80.1  | 73.5  | 70.4  | 65.8  | 63.1  | 54.9  |
|       | High TCH   | 11.3  | 17.9  | 26.5  | 29.6  | 33.8  | 36.4  | 45.1  |
|       | Total      | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Women | Low TCH    | 1.8   | 0.4   | 0.5   | 1.2   | 2.1   | 0     | 0.7   |
|       | Normal TCH | 91.2  | 89.3  | 87.9  | 83.3  | 78.3  | 72.7  | 47.0  |
|       | High TCH   | 7.0   | 10.3  | 11.7  | 15.5  | 19.6  | 27.3  | 52.3  |
|       | Total      | 100   | 100   | 100   | 100   | 100   | 100   | 100   |

#### b. HDL

The HDL of both men and women decreases with increasing age (see table 2-57), but in most age groups, there are no remarkable differences between the HDL of men and women. Compared with men, women have a higher HDL.

Table 2-57 Average HDL of adults in Macao (mmol/L)

| Age group | Men |           |       | Women |           |       | Difference | Significance |
|-----------|-----|-----------|-------|-------|-----------|-------|------------|--------------|
|           | N   | $\bar{X}$ | SD    | N     | $\bar{X}$ | SD    |            |              |
| 20~       | 81  | 1.322     | 0.269 | 116   | 1.611     | 0.350 | -0.289     | **           |
| 25~       | 154 | 1.280     | 0.361 | 239   | 1.567     | 0.344 | -0.286     | **           |
| 30~       | 193 | 1.229     | 0.323 | 212   | 1.537     | 0.410 | -0.309     | **           |
| 35~       | 240 | 1.215     | 0.285 | 254   | 1.515     | 0.367 | -0.299     | **           |
| 40~       | 297 | 1.190     | 0.288 | 243   | 1.517     | 0.351 | -0.327     | **           |
| 45~       | 222 | 1.199     | 0.318 | 189   | 1.548     | 0.392 | -0.349     | **           |
| 50~       | 118 | 1.264     | 0.331 | 158   | 1.589     | 0.465 | -0.325     | **           |

The percentage of men's high HDL is larger than that of women. And with the growth of age, the percentage of High HDL for both men and women increases (see table 2-58).

Table 2-58 HDL categories for adults in Macao (%)

|       |            | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 | 50-54 |
|-------|------------|-------|-------|-------|-------|-------|-------|-------|
| Men   | Normal HDL | 82.7  | 86.3  | 90.2  | 93.3  | 95.3  | 94.1  | 92.4  |
|       | High HDL   | 17.3  | 13.7  | 9.8   | 6.7   | 4.7   | 5.9   | 7.6   |
| Women | Normal HDL | 91.4  | 94.6  | 92.9  | 94.5  | 94.7  | 94.2  | 94.3  |
|       | High HDL   | 8.6   | 5.4   | 7.1   | 5.5   | 5.3   | 5.8   | 5.7   |

**c. LDL**

Table 2-59 shows that for men, remarkable differences of LDL between different age groups below age 40 are found. While for women, LDL increase with the growth of age, but no remarkable differences found between different age groups. Compared with men, women have a remarkable lower LDL level at the age of 25-49.

Table 2-59 The average LDL of adults in Macao (mmol/L)

| Age group | Men |           |       | Women |           |       | Difference | Significance |
|-----------|-----|-----------|-------|-------|-----------|-------|------------|--------------|
|           | N   | $\bar{X}$ | SD    | N     | $\bar{X}$ | SD    |            |              |
| 20~       | 81  | 2.909     | 0.898 | 116   | 2.902     | 0.817 | 0.007      |              |
| 25~       | 153 | 3.277     | 1.086 | 239   | 3.033     | 0.718 | 0.244      | **           |
| 30~       | 193 | 3.547     | 0.998 | 212   | 3.105     | 0.823 | 0.442      | **           |
| 35~       | 240 | 3.796     | 1.355 | 254   | 3.232     | 0.908 | 0.563      | **           |
| 40~       | 297 | 3.734     | 1.262 | 243   | 3.378     | 0.911 | 0.356      | **           |
| 45~       | 222 | 3.889     | 1.134 | 189   | 3.622     | 1.199 | 0.268      | **           |
| 50~       | 118 | 3.929     | 0.900 | 158   | 4.041     | 0.991 | -0.112     | *            |

**d. TG**

Table 2-60 shows that with the growth in age, men's TG increases, remarkable differences found between the age groups before age 40, and no remarkable difference found after age 40. While for women, remarkable differences found only between age groups after age 40.

Table 2-60 The average TG of adults in Macao (mmol/L)

| Age group | Men |           |       | Women |           |       | Difference | Significance |
|-----------|-----|-----------|-------|-------|-----------|-------|------------|--------------|
|           | N   | $\bar{X}$ | SD    | N     | $\bar{X}$ | SD    |            |              |
| 20~       | 81  | 1.083     | 0.641 | 116   | 0.788     | 0.340 | 0.295      | **           |
| 25~       | 154 | 1.244     | 0.836 | 239   | 0.850     | 0.399 | 0.394      | **           |
| 30~       | 193 | 1.509     | 1.001 | 211   | 0.911     | 0.512 | 0.598      | **           |
| 35~       | 240 | 1.787     | 1.878 | 254   | 0.908     | 0.467 | 0.879      | **           |
| 40~       | 297 | 1.740     | 1.165 | 243   | 0.971     | 0.531 | 0.769      | **           |
| 45~       | 222 | 1.563     | 1.015 | 189   | 1.135     | 0.803 | 0.428      | **           |
| 50~       | 118 | 1.587     | 0.803 | 158   | 1.190     | 0.604 | 0.397      | **           |

### e. Glucose (Blood Sugar)

The result shows that with the growth in age, glucose increases. Compared with men, women have a lower glucose (see table 2-61). From age 30 to 44, men's glucose is remarkably higher than that of women.

Table 2-61 The average glucose of adults in Macao (mmol/L)

| Age group | Men |           |       | Women |           |       | Difference | Significance |
|-----------|-----|-----------|-------|-------|-----------|-------|------------|--------------|
|           | N   | $\bar{X}$ | SD    | N     | $\bar{X}$ | SD    |            |              |
| 20~       | 81  | 4.834     | 0.502 | 116   | 4.694     | 0.415 | 0.140      | *            |
| 25~       | 154 | 5.012     | 1.738 | 239   | 4.799     | 0.882 | 0.212      |              |
| 30~       | 193 | 5.094     | 1.011 | 212   | 4.801     | 0.466 | 0.293      | **           |
| 35~       | 240 | 5.232     | 1.074 | 254   | 4.903     | 0.646 | 0.329      | **           |
| 40~       | 297 | 5.282     | 0.944 | 243   | 5.001     | 0.788 | 0.282      | **           |
| 45~       | 222 | 5.301     | 1.371 | 189   | 5.196     | 1.102 | 0.105      |              |
| 50~       | 118 | 5.366     | 0.791 | 158   | 5.181     | 0.881 | 0.185      |              |

The table 2-62 shows that with the growth in age, the percentage for high glucose increases.

Table 2-62 The glucose categories for adults in Macao (%)

|       |                | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 | 50-54 |
|-------|----------------|-------|-------|-------|-------|-------|-------|-------|
| Men   | Normal glucose | 98.8  | 96.7  | 95.3  | 94.6  | 93.6  | 92.3  | 86.4  |
|       | High glucose   | 1.2   | 3.3   | 4.7   | 5.4   | 6.4   | 7.7   | 13.6  |
| Women | Normal glucose | 100   | 99.2  | 99.5  | 98.8  | 97.9  | 94.2  | 91.8  |
|       | High glucose   | 0     | 0.8   | 0.5   | 1.2   | 2.1   | 5.8   | 8.2   |

### f. Red Blood Cell (RBC)

Men have a remarkably higher RBC than women. Almost all the samples' RBC are normal.(see table 2-63)

Table 2-63 Average RBC of adults in Macao (g/dl)

| Age | Men |           |     | Women |           |     | Difference | Significance |
|-----|-----|-----------|-----|-------|-----------|-----|------------|--------------|
|     | N   | $\bar{X}$ | SD  | N     | $\bar{X}$ | SD  |            |              |
| 20~ | 81  | 15.3      | 1.0 | 116   | 13.4      | 0.9 | 1.9        | **           |
| 25~ | 153 | 15.1      | 1.2 | 239   | 13.2      | 1.1 | 1.9        | **           |
| 30~ | 193 | 15.1      | 1.1 | 212   | 13.3      | 1.0 | 1.8        | **           |
| 35~ | 240 | 15.2      | 1.2 | 254   | 13.0      | 1.2 | 2.2        | **           |
| 40~ | 296 | 15.2      | 1.3 | 243   | 13.0      | 1.3 | 2.1        | **           |
| 45~ | 219 | 14.9      | 1.2 | 189   | 13.0      | 1.5 | 2.0        | **           |
| 50~ | 118 | 15.1      | 1.1 | 158   | 13.4      | 1.1 | 1.7        | **           |

## 2.5 Effect of exercises on physical fitness

According to the research results, exercise has obvious effect on physical capacity, and appropriate exercises can improve fitness level. In order to learn the relationship between exercises and fitness, samples are divided in to two groups: exercise participants and exercises non-participants.

### 2.5.1 Effect of Exercises on Shape

#### a. Body Fat Ratio (BFR)

As table 2-64 shows, exercises has no remarkable effect on body fat ratio, although the BFRs of 20-34 years old male and 40-44 years old female exercise participants have a trend of decrease.

Table 2-64 Effect of exercises on BFR (%)

| Sex   | Age | Participants |      | Non-participants |      | Difference | Significance |
|-------|-----|--------------|------|------------------|------|------------|--------------|
|       |     | N            | Mean | N                | Mean |            |              |
| Men   | 20~ | 142          | 17.4 | 42               | 18.0 | -0.6       |              |
|       | 25~ | 148          | 20.3 | 102              | 21.2 | -0.9       |              |
|       | 30~ | 142          | 22.4 | 128              | 23.4 | -1         |              |
|       | 35~ | 167          | 22.2 | 175              | 22.8 | -0.6       |              |
|       | 40~ | 220          | 23.9 | 175              | 22.9 | 1          |              |
|       | 45~ | 160          | 23.4 | 137              | 22.4 | 1          |              |
|       | 50~ | 88           | 22.3 | 67               | 21.8 | 0.5        |              |
| Women | 20~ | 85           | 27.9 | 105              | 27.4 | 0.5        |              |
|       | 25~ | 143          | 27.7 | 208              | 27.7 | 0          |              |
|       | 30~ | 122          | 30.4 | 175              | 30.7 | -0.3       |              |
|       | 35~ | 126          | 32.9 | 202              | 32.8 | 0.1        |              |
|       | 40~ | 136          | 33.6 | 177              | 34.3 | -0.7       |              |
|       | 45~ | 120          | 34.2 | 121              | 34.4 | -0.2       |              |
|       | 50~ | 108          | 35.2 | 91               | 35.9 | -0.7       |              |

note: \*\* P < 0.01 \* P < 0.05

#### b. Waist-to-Hip Girth Ratio

Exercises has no remarkable effect on waist-to-hip girth ratio. Although the Waist-to-hip ratios of 20-34 years old male and 40-44 years old female exercises participant have a trend to decrease (table 2-65).

Table 2- 65 Effect of exercises on waist-to-hip girth ratio

| Sex   | Age group | Participant |      | Non-participant |      | Difference | Significance |
|-------|-----------|-------------|------|-----------------|------|------------|--------------|
|       |           | N           | Mean | N               | Mean |            |              |
| Men   | 20~       | 142         | 80.4 | 42              | 81.2 | -0.8       |              |
|       | 25~       | 148         | 83.4 | 102             | 84.4 | -1         |              |
|       | 30~       | 142         | 85.8 | 128             | 86.7 | -0.9       |              |
|       | 35~       | 167         | 87.9 | 175             | 88.1 | -0.2       |              |
|       | 40~       | 220         | 88.8 | 175             | 89.5 | -0.7       |              |
|       | 45~       | 160         | 89.2 | 137             | 89.2 | 0          |              |
|       | 50~       | 88          | 90.1 | 67              | 89.6 | 0.5        |              |
| Women | 20~       | 85          | 77.5 | 105             | 77.2 | 0.3        |              |
|       | 25~       | 143         | 78.7 | 208             | 79.0 | -0.3       |              |
|       | 30~       | 122         | 81.0 | 175             | 81.5 | -0.5       |              |
|       | 35~       | 126         | 83.5 | 202             | 82.7 | 0.8        |              |
|       | 40~       | 136         | 84.3 | 177             | 85.2 | -0.9       |              |
|       | 45~       | 120         | 86.9 | 121             | 87.1 | -0.2       |              |
|       | 50~       | 108         | 89.6 | 91              | 89.8 | -0.2       |              |

note: \*\* P < 0.01 \* P < 0.05

### 2.5.2 Effect of Exercises on Physiological Capacity

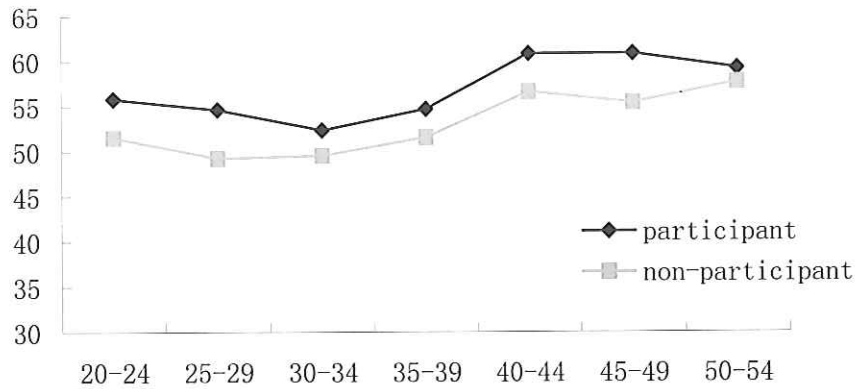
#### a. Index of the Step Test

The step test is an alternative test to determine the cardiorespiratory fitness level. As table 2-66, graph 2-9/2-10 show, index of the step test of exercise participants is obviously higher than that of non-participants, which means that the exercise participants have a higher cardiorespiratory fitness level than non-participants.

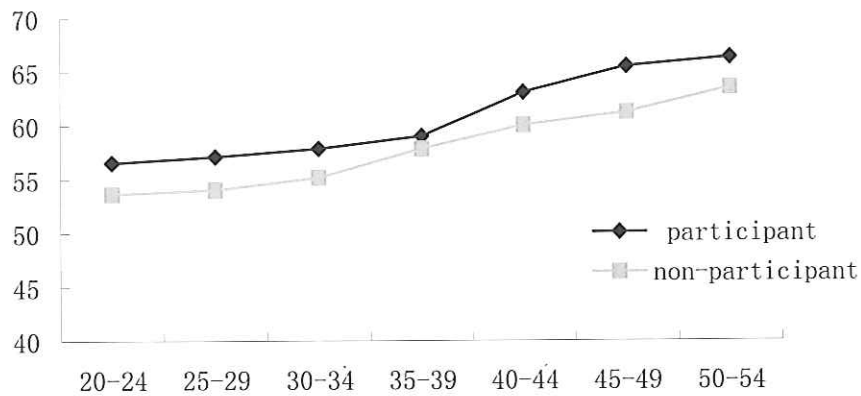
Table 2-66 Effect of exercises on the step test

| Sex   | Age | Participants |      | Non-participants |      | Difference | Significance |
|-------|-----|--------------|------|------------------|------|------------|--------------|
|       |     | N            | Mean | N                | Mean |            |              |
| Men   | 20~ | 142          | 55.7 | 42               | 51.5 | 4.2        | **           |
|       | 25~ | 148          | 54.6 | 102              | 49.2 | 5.4        | **           |
|       | 30~ | 142          | 52.3 | 128              | 49.5 | 2.8        | **           |
|       | 35~ | 167          | 54.6 | 175              | 51.5 | 3.1        | **           |
|       | 40~ | 220          | 60.8 | 175              | 56.5 | 4.3        | **           |
|       | 45~ | 160          | 60.8 | 137              | 55.3 | 5.5        | **           |
|       | 50~ | 88           | 59.2 | 67               | 57.6 | 1.6        |              |
| Women | 20~ | 85           | 56.5 | 105              | 53.6 | 2.9        | *            |
|       | 25~ | 143          | 57.1 | 208              | 54.0 | 3.1        | **           |
|       | 30~ | 122          | 57.8 | 175              | 55.1 | 2.7        | **           |
|       | 35~ | 126          | 59.0 | 202              | 57.8 | 1.2        |              |
|       | 40~ | 136          | 63.0 | 177              | 60.0 | 3.0        | *            |
|       | 45~ | 120          | 65.4 | 121              | 61.2 | 4.2        | **           |
|       | 50~ | 108          | 66.3 | 91               | 63.5 | 2.8        |              |

note: \*\* P < 0.01 \* P < 0.05



Graph 2-9 Effect of exercises on the index the of step test (Men)



Graph 2-10 Effects of exercises on the index of step test (women)

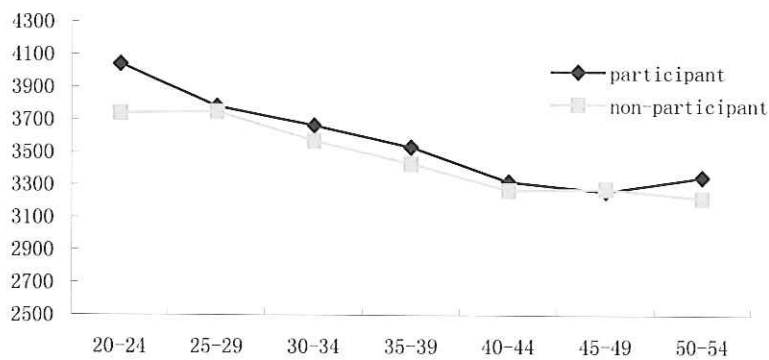
b. Vital Capacity

It can be seen from table 2-67 and graph 2-11, 2-12, when vital capacity reaches its peak value in the age group of 20-24-year-old, the vital capacity of exercise participants is remarkably greater than that of exercises non-participants. Beginning from age group of 25-29-year-old, the vital capacity decreases. No remarkable difference found between the vital capacities of exercise participants and non-participants, but in most age groups, the average vital capacity of exercise participants is greater than that of non-participants.

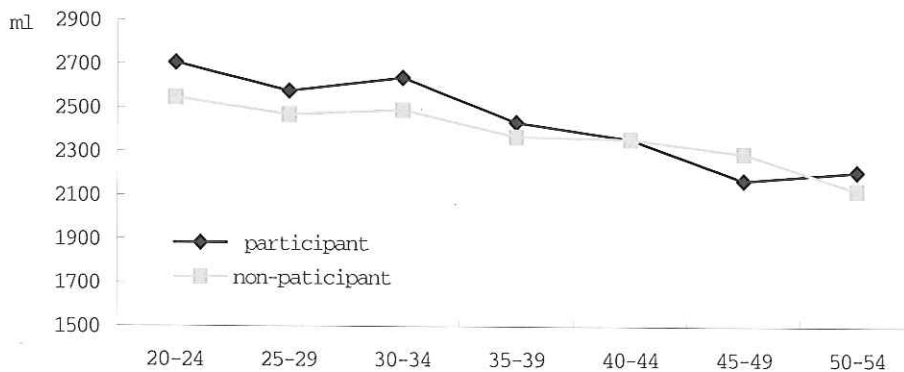
Table2-67 Effect of exercises on vital capacity (ml)

| Sex   | Age group | Participant |        | Non-participant |        | Difference | significance |
|-------|-----------|-------------|--------|-----------------|--------|------------|--------------|
|       |           | N           | Mean   | N               | Mean   |            |              |
| Men   | 20~       | 142         | 4041.9 | 42              | 3739.7 | 302.2      | *            |
|       | 25~       | 148         | 3781.8 | 102             | 3747.4 | 34.4       |              |
|       | 30~       | 142         | 3664.3 | 128             | 3570.6 | 93.7       |              |
|       | 35~       | 167         | 3531.2 | 175             | 3429.3 | 101.9      |              |
|       | 40~       | 220         | 3320.5 | 175             | 3266.8 | 53.7       |              |
|       | 45~       | 160         | 3259.9 | 137             | 3277.2 | -17.3      |              |
|       | 50~       | 88          | 3347.6 | 67              | 3219.2 | 128.4      |              |
| Women | 20~       | 85          | 2705.4 | 105             | 2545.3 | 160.1      | *            |
|       | 25~       | 143         | 2576.7 | 208             | 2468.4 | 108.3      |              |
|       | 30~       | 122         | 2637.1 | 175             | 2489.8 | 147.3      |              |
|       | 35~       | 126         | 2433.2 | 202             | 2367.8 | 65.4       |              |
|       | 40~       | 136         | 2356.0 | 177             | 2357.2 | -1.2       |              |
|       | 45~       | 120         | 2168.6 | 121             | 2291.2 | -122.6     |              |
|       | 50~       | 108         | 2208.7 | 91              | 2124   | 84.7       |              |

note: \*\* P < 0.01 \* P < 0.05



Graph 2-11 Effect of exercises on vital capacity of men in Macao



Graph 2-12 Effect of exercises on vital capacity of women in Macao

### 2.5.3 Effect of Exercises on Physical Capacity

#### a. Grip Strength

As table 2-68, graph 2-13, 2-14 show: in the men's age groups of 40-44-year-old and 50-54-year-old, the grip strength of exercise participants is remarkably larger than that of non-participants. But, in age group of 25-29-year-old, the grip strength of exercise participants is remarkably smaller than that of non-participants.

As for women, from the age 20 to 34, the grip strength of exercise participants is remarkably larger than that of non-participants, and in the age group of 45-49-year-old, the grip strength of exercise participants is also larger than that of non-participants, but no remarkable difference found.

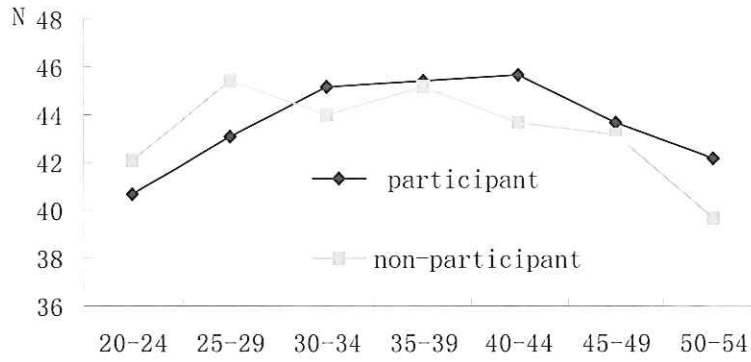
The results above suggest that exercises are helpful for improving and maintaining the strength of muscle.

Table 2-68 Effect of exercises on grip strength (N)

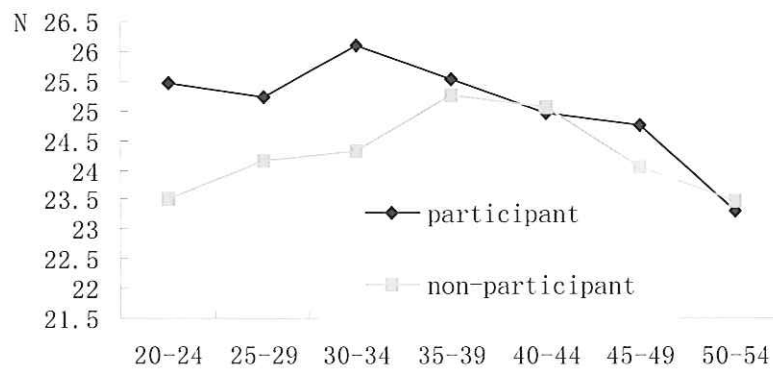
| Sex   | Age | Participant |      | Non-participant |      | Difference | significancy |
|-------|-----|-------------|------|-----------------|------|------------|--------------|
|       |     | N           | Mean | N               | Mean |            |              |
| Men   | 20~ | 142         | 40.7 | 42              | 42.0 | -1.3       |              |
|       | 25~ | 148         | 43.1 | 102             | 45.4 | -2.3       | *            |
|       | 30~ | 142         | 45.1 | 128             | 43.9 | 1.2        |              |
|       | 35~ | 167         | 45.4 | 175             | 45.1 | 0.3        |              |
|       | 40~ | 220         | 45.7 | 175             | 43.6 | 2.1        | **           |
|       | 45~ | 160         | 43.7 | 137             | 43.1 | 0.6        |              |
|       | 50~ | 88          | 42.1 | 67              | 39.6 | 2.5        | *            |
| Women | 20~ | 85          | 25.4 | 105             | 23.5 | 1.9        | **           |
|       | 25~ | 143         | 25.2 | 208             | 24.1 | 1.1        | *            |
|       | 30~ | 122         | 26.1 | 175             | 24.3 | 1.8        | **           |
|       | 35~ | 126         | 25.5 | 202             | 25.2 | 0.3        |              |
|       | 40~ | 136         | 24.9 | 177             | 25.0 | -0.1       |              |
|       | 45~ | 120         | 24.7 | 121             | 24.0 | 0.7        |              |
|       | 50~ | 108         | 23.3 | 91              | 23.4 | -0.1       |              |

note: \*\* P < 0.01 \* P < 0.05





Graph 2-13 Effect of exercises on grip strength of men in Macao



Graph 2-14 Effect of sports on grip strength of women in Macao

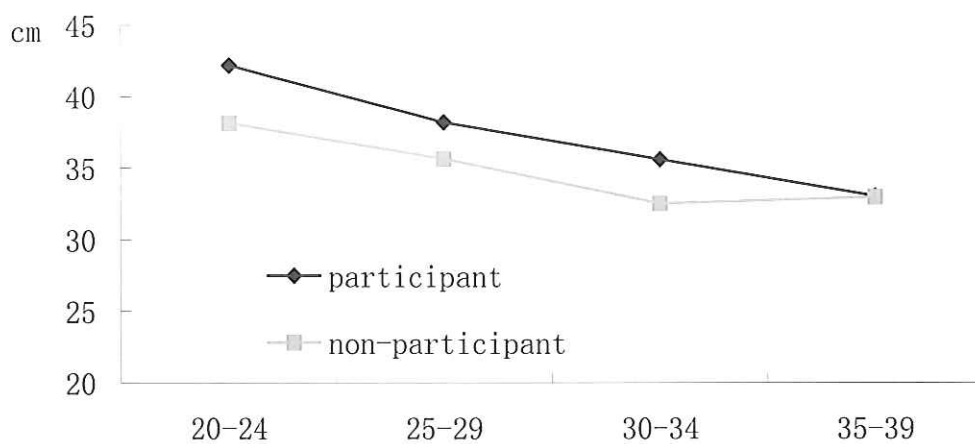
b. Vertical Jump

The result of vertical jump of exercise participants is better than that of non-participants, which suggests that exercises is helpful for improving vertical jump (see table 2-69, graph 2-15, 2-16).

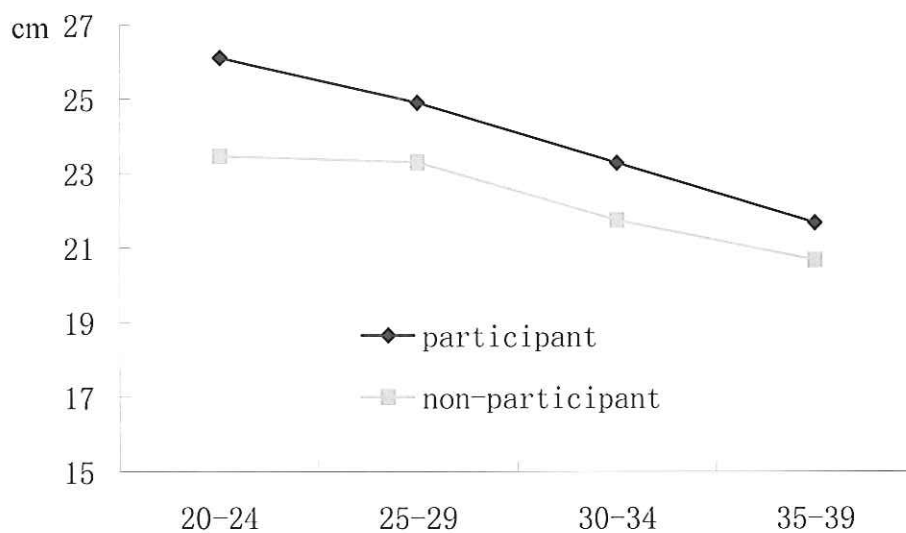
Table 2-69 Effect of exercises on vertical jump (cm)

| Sex   | Age group | Participant |      | Non-participant |      | Difference | Significancy |
|-------|-----------|-------------|------|-----------------|------|------------|--------------|
|       |           | N           | Mean | N               | Mean |            |              |
| Man   | 20~       | 142         | 42.1 | 42              | 38.1 | 4.0        | **           |
|       | 25~       | 148         | 38.1 | 102             | 35.6 | 2.5        | **           |
|       | 30~       | 142         | 35.6 | 128             | 32.5 | 3.1        | **           |
|       | 35~       | 167         | 33.0 | 175             | 32.9 | 0.1        |              |
| Women | 20~       | 85          | 26.1 | 105             | 23.4 | 2.7        | **           |
|       | 25~       | 143         | 24.8 | 208             | 23.2 | 1.6        | **           |
|       | 30~       | 122         | 23.2 | 175             | 21.7 | 1.5        | **           |
|       | 35~       | 126         | 21.6 | 202             | 20.6 | 1.0        |              |

note: \*\* P < 0.01 \* P < 0.05



Graph 2-15 Effect of exercises on vertical jump of men in Macao



Graph 2-16 Effect of exercises on vertical jump of women in Macao

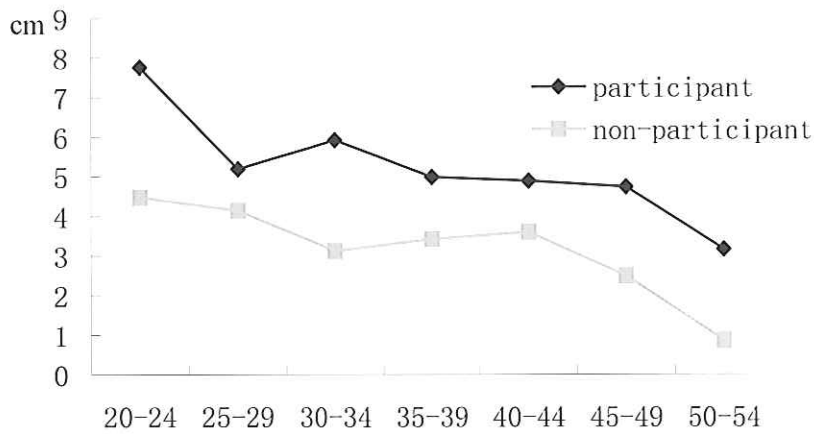
c. Sit-and-Reach

The result of sit-and-reach of exercise participants is better than that of non-participants. Remarkable differences were found at the age group of 20-24-year-old, 30-34-year-old and 45-49-year-old (men), 30-34-year-old, 35-39-year-old, 40-44-year-old, 45-49-year-old, 50-54-year-old, and 55-59-year-old (women). The results also suggest that exercises are beneficial for improving flexibility.

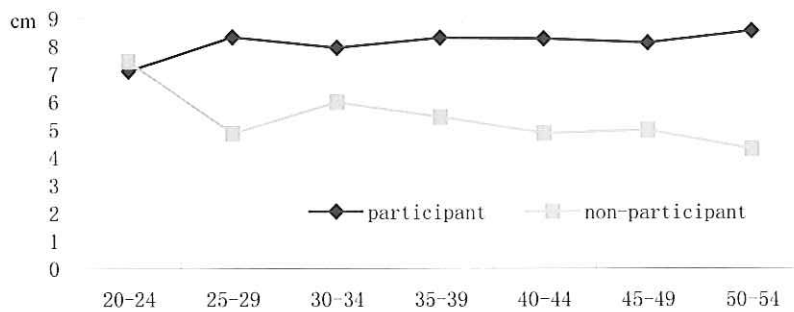
Table 2-70 Effect of exercises on sit-and-reach (cm)

| Sex   | Age (year) | Participant |      | Non-participant |      | Difference | significance |
|-------|------------|-------------|------|-----------------|------|------------|--------------|
|       |            | N           | Mean | N               | Mean |            |              |
| Men   | 20~        | 142         | 7.7  | 42              | 4.4  | 3.3        | *            |
|       | 25~        | 148         | 5.1  | 102             | 4.1  | 1.0        |              |
|       | 30~        | 142         | 5.9  | 128             | 3.1  | 2.8        | **           |
|       | 35~        | 167         | 4.9  | 175             | 3.4  | 1.5        |              |
|       | 40~        | 220         | 4.8  | 175             | 3.6  | 1.2        |              |
|       | 45~        | 160         | 4.7  | 137             | 2.4  | 2.3        | *            |
|       | 50~        | 88          | 3.1  | 67              | 0.8  | 2.3        |              |
| Women | 20~        | 85          | 7.0  | 105             | 7.4  | -0.4       |              |
|       | 25~        | 143         | 8.3  | 208             | 4.8  | 3.5        | **           |
|       | 30~        | 122         | 7.9  | 175             | 5.9  | 2.0        | *            |
|       | 35~        | 126         | 8.3  | 202             | 5.4  | 2.9        | **           |
|       | 40~        | 136         | 8.2  | 177             | 4.8  | 3.4        | **           |
|       | 45~        | 120         | 8.1  | 121             | 4.9  | 3.2        | **           |
|       | 50~        | 108         | 8.5  | 91              | 4.2  | 4.3        | **           |

note: \*\* P < 0.01 \* P < 0.05



Graph 2-17 Effect of exercises no sit-and-reach of men in Macao



Graph 2-18 Effect of exercises on sit-and-reach of women in Macao

d. 10m×4 Shuttle Run

The time of 10m×4 shuttle run of exercise participants is remarkably shorter than that of non-participants in age of 20-34-year-old (men) and of 20-39-year-old (women), which suggests exercises is helpful for improving agility.

Table 2-71 Effect of exercises on 10m×4 shuttle run (second)

| Sex   | Age (year) | Participant |      | Non-participant |      | Difference | significance |
|-------|------------|-------------|------|-----------------|------|------------|--------------|
|       |            | N           | Mean | N               | Mean |            |              |
| Men   | 20~        | 142         | 11.2 | 42              | 11.6 | -0.4       | *            |
|       | 25~        | 148         | 11.3 | 102             | 11.9 | -0.6       | **           |
|       | 30~        | 142         | 11.8 | 128             | 12.2 | -0.4       | **           |
|       | 35~        | 167         | 12.1 | 175             | 12.2 | -0.1       |              |
| Women | 20~        | 85          | 13.3 | 105             | 14.0 | -0.7       | **           |
|       | 25~        | 143         | 13.5 | 208             | 14.0 | -0.5       | **           |
|       | 30~        | 122         | 13.9 | 175             | 14.5 | -0.6       | **           |
|       | 35~        | 126         | 14.4 | 202             | 14.9 | -0.5       | **           |

note: \*\* P < 0.01 \* P < 0.05

e. One foot stand with eyes closed (OFSEC)

OFSEC is used in this survey to test balance ability. As table 2-72 shows, from age 20 to 29, male exercise participants have a better balance ability than non-participants. But from age 35 to 39, the balance ability of exercises non-participant is better than that of exercise participant, further research should be done to explain this result.

As for women, in the age groups of 30-34-year-old, 40-44-year-old and 50-54-year-old, exercise participants have a better balance ability than non-participants, but no remarkable differences found.

Table 2-72 Effect of exercises on balance ability (second)

| Sex   | Age group | Participant |      | Non-participant |      | Difference | significance |
|-------|-----------|-------------|------|-----------------|------|------------|--------------|
|       |           | N           | Mean | N               | Mean |            |              |
| Men   | 20~       | 142         | 67.4 | 42              | 40.6 | 26.8       | *            |
|       | 25~       | 148         | 56.4 | 102             | 41.4 | 15.0       | *            |
|       | 30~       | 142         | 45.5 | 128             | 45.4 | 0.1        |              |
|       | 35~       | 167         | 30.1 | 175             | 39.4 | -9.3       | *            |
|       | 40~       | 220         | 45.5 | 175             | 34.8 | 10.7       |              |
|       | 45~       | 160         | 33.8 | 137             | 34.9 | -1.1       |              |
|       | 50~       | 88          | 22.7 | 67              | 23.8 | -1.1       |              |
| Women | 20~       | 85          | 58.0 | 105             | 54.4 | 3.6        |              |
|       | 25~       | 143         | 62.7 | 208             | 60.9 | 1.8        |              |
|       | 30~       | 122         | 52.1 | 175             | 42.4 | 9.7        |              |
|       | 35~       | 126         | 37.0 | 202             | 40.4 | -3.4       |              |
|       | 40~       | 136         | 37.3 | 177             | 31.3 | 6.0        |              |
|       | 45~       | 120         | 29.4 | 121             | 31.8 | -2.4       |              |
|       | 50~       | 108         | 29.7 | 91              | 21.2 | 8.5        |              |

note: \*\* P < 0.01 \* P < 0.05

f. Selective Response Time (SRT)

As table 2-73 shows, male exercise participants have a shorter STR than non-participants, but there are no remarkable differences. For women aged 30 to 39, exercise participants have a remarkable small SRT than non-participants.

Table 2-73 Effect of exercises on selective response time (second)

| Sex   | Age | Participant |      | Non-participant |      | Difference | significance |
|-------|-----|-------------|------|-----------------|------|------------|--------------|
|       |     | N           | Mean | N               | Mean |            |              |
| Men   | 20~ | 142         | 0.38 | 42              | 0.4  | -0.02      |              |
|       | 25~ | 148         | 0.39 | 102             | 0.40 | -0.01      |              |
|       | 30~ | 142         | 0.39 | 128             | 0.40 | -0.01      |              |
|       | 35~ | 167         | 0.40 | 175             | 0.40 | 0          |              |
|       | 40~ | 220         | 0.40 | 175             | 0.41 | -0.01      |              |
|       | 45~ | 160         | 0.40 | 137             | 0.41 | -0.01      |              |
|       | 50~ | 88          | 0.42 | 67              | 0.43 | -0.01      |              |
| Women | 20~ | 85          | 0.41 | 105             | 0.41 | 0          |              |
|       | 25~ | 143         | 0.41 | 208             | 0.41 | 0          |              |
|       | 30~ | 122         | 0.41 | 175             | 0.42 | -0.01      | *            |
|       | 35~ | 126         | 0.42 | 202             | 0.43 | -0.01      | **           |
|       | 40~ | 136         | 0.44 | 177             | 0.44 | 0          |              |
|       | 45~ | 120         | 0.44 | 121             | 0.45 | -0.01      |              |
|       | 50~ | 108         | 0.46 | 91              | 0.47 | -0.01      |              |

note: \*\* P < 0.01 \* P < 0.05

**Brief summary:**

The results mentioned above suggest that exercise has no remarkable effect on BFR and waist-to-hip girth ratio. The body fat is the result of intake and consume of calorie. A larger weight and body fat are a joint result of exercises absent and overmuch intake of food.

Exercise is benefit for the cardiorespiratory fitness of adult aged 20-50. Exercise is also helpful for improving and maintaining strength, agility and flexibility, but exercises have weaker effect on balance ability and response ability.

In general, exercise participants have a better fitness level in compare to the non-participants.

**2.6 Comparison with the Mainland of China**

Different geographical environments and economic levels exist between Macao and the Mainland.

Comparative analysis between Macao and Beijing, Shanghai, Guangzhou, Changchun, Wuhan, Chengdu and Lanzhou has been done in order to find some traits of adults' fitness in Macao (see table 2-74, 2-75).

### 2.6.1 Shape

#### a. Quitelet Index

In age group of 20-24-year-old, the rank of men's Quitelet index (from the largest to the smallest) is Beijing, Changchun, Macao, Chengdu, Shanghai, Guangzhou and Lanzhou; But in the age group of 45-49-year-old, the Quitelet index of Macao's male adults ranks 5<sup>th</sup>, higher than those of Chengdu and Guangzhou. While for women, the Quitelet index of Macao is the smallest in the 7 cities.

#### b. Height

In age group of 20-24-year-old, the average height of women in Macao is nearly equal to those of Beijing, Shanghai and Changchun, it is remarkably larger than those of Chengdu and Guangzhou. In age group of 45-49-year-old, Macao ranks the 5<sup>th</sup>, and is a little larger than Chengdu and Guangzhou. As for women, in both age group of 20-24-year-old and 45-49-year-old, Macao ranks the last, and is remarkably smaller than Beijing, Shanghai, Changchun and Lanzhou.

### 2.6.2 Physiological capacity

#### a. Vital capacity

In age group of 20-24-year-old, the rank of vital capacity of men from the largest to the smallest is: Beijing, Macao, Lanzhou, Changchun, Shanghai, Guangzhou and Chengdu. The difference between Macao and Chengdu is remarkable. In age group of 45-49-year-old, the rank is: Beijing, Shanghai, Changchun, Macao, Lanzhou, Chengdu and Guangzhou. The differences between Macao and Chengdu, Guangzhou are remarkable.

The vital capacity of 20-24 years old women is remarkably smaller than those of Beijing and Lanzhou, and the vital capacity of 45-49 years old women is remarkably smaller than those of Beijing and Guangzhou

#### b. Index of step test

For men, from the largest to the smallest, the rank is: Changchun, Guangzhou, Macao, Lanzhou, Shanghai, Chengdu and Beijing. For women, the rank (from the largest to the smallest) is: Changchun, Chengdu, Shanghai, Guangzhou, Lanzhou, Macao and Beijing.

### 2.6.3 Physical capacity

#### a. Strength

Compared with the cities on the Mainland, the muscular endurance (Pull-ups for men and Sit-ups for women) of men aged 20-24 is the best, and is remarkably larger than those of other cities. As for women, Macao ranks the second, and is remarkably smaller than Beijing.

In age group of 20-24-year-old, the result of vertical jump of men ranks the first, and is remarkably higher than those of the cities except Guangzhou. Female ranks third, and remarkably lower than Guangzhou.

In the age group of 20-24-year-old, the back strength of Macao's men ranks the first, and is remarkably larger than those of Beijing, Shanghai, Guangzhou and Lanzhou. Women's back strength ranks the last, and is remarkably smaller than those of Beijing, Guangzhou and Chengdu.

The grip strength of Macao's adults ranks the last, and is remarkably smaller than those of other

cities.

b. Agility (10m×4 shuttle run)

Macao's men have the best agility in the 7 cities. Women's agility ranks the second, a little smaller than Beijing.

c. Flexibility (Sit-and-reach)

The result of sit-and-reach of Macao's adults ranks the last.

d. Balance ability (one foot stand with eyes closed,OFSEC)

Macao's adults have a better balance ability. In two age groups, the result of OFSEC ranks the first.

e. Response ability

In the age group of 45-49-year-old, the response ability ranks the last in the 7 cities.

Table 2-74 Comparison with some cities on the Mainland (men)

| Age (year) | Indexes            | Macao           | Beijing         | Changchun       | Shanghai        | Guangzhou       | Chengdu         | Lanzhou         |
|------------|--------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
|            |                    | $\bar{X} \pm S$ | $\bar{X} \pm S$ | $\bar{X} \pm S$ | $\bar{X} \pm S$ | $\bar{X} \pm S$ | $\bar{X} \pm S$ | $\bar{X} \pm S$ |
| 20-24      | Quitelet index     | 370.9±54.4      | 386.8±54.1*     | 383.5±47.1      | 365.9±36.8      | 363.5±45.2      | 368.7±48.9      | 363.3±35.0      |
|            | Height             | 171.6±5.10      | 171.6±6.0       | 171.3±5.7       | 171.7±4.2       | 168.9±5.6**     | 169.9±5.9*      | 170.7±5.2       |
|            | Vital capacity     | 3972.9±728.9    | 4012.9±665.4    | 3878.5±727.5    | 3809.6±438.4*   | 3801.3±583.8    | 3654.0±667.6**  | 3958.8±476.1    |
|            | Index of step test | 54.7±8.70       | 52.5±6.4**      | 56.8±5.0*       | 54.1±4.8        | 55.3±6.8        | 53.5±6.3        | 54.2±5.7        |
|            | Grip strength      | 41.0±8.0        | 46.1±7.4**      | 48.0±6.4**      | 48.3±7.0**      | 46.5±7.4**      | 45.9±7.4**      | 44.5±5.5**      |
|            | Back strength      | 133.6±25.3      | 125.8±24.6**    | 131.5±18.6      | 124.7±18.1**    | 121.2±21.5**    | 131.6±27.7      | 127.4±14.7*     |
|            | Sit-and-reach      | 7.0±9.1         | 11.1±7.8**      | 11.6±5.3**      | 10.6±6.5**      | 11.6±7.2**      | 9.0±6.6         | 10.4±6.4**      |
|            | Vertical jump      | 41.2±7.9        | 36.6±7.3**      | 36.2±7.2**      | 36.3±5.2**      | 38.2±11.7       | 33.8±6.5**      | 33.9±4.9**      |
|            | OFSEC              | 61.2±71.4       | 35.1±33.1**     | 35.8±19.0**     | 44.5±41.3*      | 52.5±28.1       | 48.6±36.5       | 56.1±50.2       |
|            | 10*4shuttle run    | 11.3±1.0        | 12.0±1.1**      | 12.7±1.5**      | 11.4±1.0        | 11.8±0.8**      | 12.3±1.2**      | 12.1±1.0**      |
| 45-49      | Pull-ups           | 34.4±15.2       | 23.5±11.1**     | 23.5±10.2**     | 25.1±8.5**      | 28.5±7.2**      | 23.5±10.6**     | 21.1±8.8**      |
|            | Quitelet index     | 400.7±55.9      | 424.0±58.9**    | 414.2±51.3      | 410.6±50.6      | 390.5±47.6      | 397.4±47.5      | 406.7±47.3      |
|            | Height             | 167.1±5.8       | 169.8±6.7**     | 171.0±5.3**     | 169.5±4.5**     | 166.6±6.2       | 165.9±5.0       | 169.6±5.0*      |
|            | Vital capacity     | 3267.9±659.6    | 3355±711.7      | 3297.8±710.8    | 3319.2±684.8    | 2964.2±562.2**  | 3057.3±618.7*   | 3186.5±591.8    |
|            | Index of step test | 58.3±11.1       | 53.8±8.0**      | 56.7±6.0**      | 57.2±6.9        | 57.0±7.0        | 53.4±8.1**      | 55.0±7.9*       |
|            | Grip strength      | 43.4±7.4        | 47.5±7.8**      | 50.0±7.2**      | 47.5±6.4**      | 45.0±7.6        | 44.0±7.6        | 43.8±6.4        |
|            | Sit-and-reach      | 3.7±8.3         | 4.1±8.9         | 7.3±7.8**       | 5.5±7.9         | 5.0±7.6         | 3.9±7.6         | 4.0±7.9         |
|            | OFSEC              | 34.3±57.8       | 19.8±23.3**     | 19.3±13.3**     | 20.4±23.6**     | 20.8±15.5**     | 24.5±18.8*      | 13.3±13.8**     |
|            | Response time      | 0.26±0.02       | 0.21±0.03**     | 0.20±0.02**     | 0.21±0.04**     | 0.22±0.03**     | 0.24±0.03**     | 0.24±0.03**     |

\*Compared with Macao P≤0.05; \*\*Compared with Macao P≤0.01



Table 2-75 Comparison with some cities on the Mainland (women)

| Age (year) | Indexes            | Macao           | Beijing         | Changchun       | Shanghai        | Guangzhou       | Chengdu         | Lanzhou         |
|------------|--------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
|            |                    | $\bar{X} \pm S$ | $\bar{X} \pm S$ | $\bar{X} \pm S$ | $\bar{X} \pm S$ | $\bar{X} \pm S$ | $\bar{X} \pm S$ | $\bar{X} \pm S$ |
| 20-24      | Quitelet index     | 312.4±42.7      | 338.0±31.3**    | 337.1±54.8**    | 324.1±97.3      | 315.3±41.2      | 324.9±35.6*     | 318.0±39.6      |
|            | Height             | 158.2±5.4       | 160.8±5.0**     | 161.4±5.0**     | 160.1±5.7*      | 159.2±5.0       | 158.9±5.3       | 159.8±4.6**     |
|            | Vital capacity     | 2616.9±535.5    | 2984.6±527.1**  | 2632±533.4      | 2747.6±728.3    | 2677±360.7      | 2522.7±457.2    | 2750.6±477.9*   |
|            | Index of step test | 54.9±8.3        | 52.6±8.9*       | 58.6±4.6**      | 56.3±4.8        | 54.9±4.5        | 57.1±8.6        | 54.3±6.8        |
|            | Grip strength      | 24.3±4.8        | 27.8±5.4**      | 28.3±4.5**      | 30.1±1.8**      | 27.6±5.1**      | 28.4±8.2**      | 26.2±5.9**      |
|            | Back strength      | 67.1±20.0       | 74.9±14.2**     | 70.1±17.4       | 67.4±18.3       | 73.2±14.6**     | 77.3±14.6**     | 68.5±19.1       |
|            | Sit-and-reach      | 7.2±8.1         | 11.6±5.5**      | 13.9±6.4**      | 13.4±1.0**      | 11.9±7.0**      | 9.4±6.6*        | 9.7±6.3**       |
|            | Vertical jump      | 24.6±4.9        | 24.9±6.7        | 23.2±5.0*       | 22.9±1.0**      | 26.8±5.9**      | 21.8±3.7**      | 23.5±4.4        |
|            | 0FSEC              | 56±56.3         | 42.7±31.9**     | 44.1±34.8*      | 32.4±18.3**     | 49.3±17.5       | 49.7±68.7       | 51.1±36.1       |
|            | 10*4shuttle run    | 13.7±1.2        | 13.6±1.8        | 15.1±1.8**      | 14.0±1.0        | 13.8±1.0        | 14.4±2.1*       | 13.8±1.5        |
| 45-49      | Pull-ups           | 26.3±9.9        | 28.9±11.8       | 23.8±6.9*       | 22.3±9.8**      | 24.9±7.8        | 18.2±10.3**     | 17.7±9.7**      |
|            | Quitelet index     | 358.5±46.9      | 390.2±46.4**    | 383±34.6**      | 364.1±46.6      | 366.7±43.4      | 372.6±45.4*     | 371.9±40.8**    |
|            | Height             | 154.9±5.1       | 160.1±5.3**     | 159.1±4.2**     | 158.0±6.2**     | 156.6±4.6*      | 158.6±5.8**     | 157.5±4.3**     |
|            | Vital capacity     | 2230.4±538.8    | 2585.3±627.2**  | 2327.6±498.5    | 2109.7±526.3    | 2367±501.2      | 2242.8±568.7    | 2198.9±466.7    |
|            | Index of step test | 63.3±11.6       | 56.8±8.3**      | 58.9±5.4**      | 57.2±6.1**      | 60.4±7.5*       | 61.7±11         | 58.5±8.6**      |
|            | Grip strength      | 24.4±5.0        | 28.8±6.8**      | 29.6±5.0**      | 28.9±4.8**      | 28±4.9**        | 28.7±7.8**      | 27.7±4.8**      |
|            | Sit-and-reach      | 6.5±7.9         | 7.4±8.3         | 11.7±6.9**      | 5.6±4.9         | 6.7±6.5         | 5.5±7.0         | 6.4±9.3         |
|            | 0FSEC              | 30.6±36.4       | 17.5±22.6**     | 25.5±11.3       | 14.3±11.5**     | 14.2±13.5**     | 12.4±24.9**     | 13.8±19.6**     |
|            | Response time      | 0.26±0.02       | 0.21±0.04**     | 0.21±0.03**     | 0.22±0.05**     | 0.23±0.03**     | 0.26±0.04       | 0.25±0.04**     |

\*Compared with Macao P≤0.05; \*\*Compared with Macao P≤0.01

## 2.7 Fitness Level Categories

### 2.7.1 General Fitness Level Categories

According to the "Fitness standards for Chinese people" established by China National Physical capacity Monitoring Center, on the basis of a nationwide fitness survey in 2000, 81.2% of the total samples (3961) in "Average" and over fitness categories, among which 6.3% are in "Excellent" category, 46.4% are "Good", and 28.5% are "Average". There are still 18.8% adults in "Poor" fitness category.

Table 2-76 Percentages for different fitness categories (%)

| Fitness categories | Men  | Women | Total |
|--------------------|------|-------|-------|
| Excellent          | 6.7  | 5.9   | 6.3   |
| Good               | 44.1 | 48.6  | 46.4  |
| Average            | 27.8 | 29.2  | 28.5  |
| Poor               | 21.5 | 16.3  | 18.8  |

The percentage of "Average" and above categories for adults aged 40-59 is larger than that of adults aged 20-39. The percentage of "Poor" category for women is larger than that of men.

Table 2-77 Percentages for different fitness categories in each age group (%)

| Sex   | Categories | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 | 50-54 | 55-59 | Total |
|-------|------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Men   | Poor       | 7.6   | 10.0  | 11.1  | 6.7   | 3.0   | 4.7   | 4.5   | 8.5   | 6.7   |
|       | Average    | 39.1  | 49.2  | 50.7  | 49.1  | 41.3  | 39.4  | 37.4  | 37.3  | 44.1  |
|       | Good       | 30.4  | 25.6  | 27.8  | 25.7  | 27.6  | 30.6  | 30.3  | 22.0  | 27.8  |
|       | Excellent  | 22.8  | 15.2  | 10.4  | 18.4  | 28.1  | 25.3  | 27.7  | 32.2  | 21.5  |
| Women | Poor       | 8.9   | 8.5   | 5.1   | 6.7   | 2.9   | 4.1   | 3.5   | 10.0  | 5.9   |
|       | Average    | 57.9  | 49.6  | 55.2  | 54.3  | 44.1  | 40.7  | 42.2  | 34.4  | 48.6  |
|       | Good       | 23.7  | 27.4  | 27.9  | 27.1  | 32.9  | 33.2  | 32.2  | 28.9  | 29.2  |
|       | Excellent  | 9.5   | 14.5  | 11.8  | 11.9  | 20.1  | 22.0  | 22.1  | 26.7  | 16.3  |

### 2.7.2 Fitness categories for each testing item

Table 2-78 Fitness categories for each testing item of adults aged 20-39 (%)

| Sex | Categories | Vital Capacity | Pull-ups/Sit-ups | Index of step test | Grip strength | Vertical jump | OFSEC | SRT  | Sit-and-reach |
|-----|------------|----------------|------------------|--------------------|---------------|---------------|-------|------|---------------|
| Men | Badly poor | 1.7            | 4.9              | 5.5                | 5.4           | 3.9           | 0.2   | 0.1  | 10.3          |
|     | Very poor  | 8.0            | 6.1              | 15.6               | 15.5          | 3.2           | 3.6   | 0.1  | 18.2          |
|     | Poor       | 26.4           | 13.6             | 30.8               | 29.8          | 14.9          | 18.9  | 1.1  | 27.6          |
|     | Average    | 27.0           | 24.9             | 26.8               | 28.0          | 29.5          | 31.8  | 7.5  | 22.9          |
|     | Good       | 24.8           | 27.5             | 16.4               | 17.4          | 30.4          | 30.0  | 36.3 | 15.4          |
|     | Excellent  | 12.1           | 23.0             | 4.9                | 3.9           | 18.1          | 15.4  | 54.9 | 5.5           |

|       |            |      |      |      |      |      |      |      |      |
|-------|------------|------|------|------|------|------|------|------|------|
| Women | Badly poor | 1.2  | 9.5  | 1.0  | 10.2 | 3.6  | 0.1  |      | 11.9 |
|       | Very poor  | 7.0  | 1.5  | 10.1 | 18.4 | 1.5  | 2.9  |      | 14.8 |
|       | Poor       | 32.8 | 6.9  | 29.6 | 37.1 | 16.3 | 13.6 | 0.7  | 28.6 |
|       | Average    | 28.3 | 29.4 | 29.2 | 23.2 | 34.8 | 29.9 | 7.0  | 24.3 |
|       | Good       | 20.2 | 38.9 | 22.2 | 9.3  | 32.8 | 34.0 | 40.9 | 14.5 |
|       | Excellent  | 10.5 | 13.9 | 7.9  | 1.7  | 11.0 | 19.4 | 51.4 | 5.9  |

The result shows that there are 0.1%-10.3% men and 0.1%-11.9% women in "Very poor" or "Badly poor" category in some testing. About 30% adults have a poor sit-and-reach result. The results of pull-ups/sit-ups, vertical jump, OFSEC and SRT of Macao's adults are good.

Table 2-79 Fitness categories for each testing item of adults aged 40-59 (%)

| Sex   | Grades     | Vital capacity | Index of step test | Grip strength | OFSEC | SRT  | Sit-and-reach |
|-------|------------|----------------|--------------------|---------------|-------|------|---------------|
| Men   | Badly poor | 1.2            | 1.2                | 3.9           |       |      | 6.8           |
|       | Very poor  | 5.6            | 6.8                | 9.6           | 5.0   | 0.1  | 11.1          |
|       | Poor       | 28.0           | 26.7               | 29.9          | 16.9  | 0.4  | 29.1          |
|       | Average    | 29.7           | 28.3               | 30.7          | 28.1  | 3.8  | 27.4          |
|       | Good       | 25.2           | 24.5               | 21.0          | 31.6  | 28.8 | 19.3          |
|       | Excellent  | 10.3           | 12.5               | 5.0           | 18.4  | 66.9 | 6.2           |
| Women | Badly poor | 1.2            | 1.4                | 9.8           |       | 0.1  | 6.8           |
|       | Very poor  | 7.1            | 4.2                | 17.6          | 2.4   |      | 11.5          |
|       | Poor       | 30.2           | 16.4               | 38.4          | 11.9  | 0.8  | 29.1          |
|       | Average    | 32.6           | 24.8               | 21.5          | 29.3  | 6.4  | 25.9          |
|       | Good       | 19.0           | 31.0               | 11.6          | 36.9  | 41.8 | 19.7          |
|       | Excellent  | 9.8            | 22.3               | 1.1           | 19.6  | 50.9 | 7.1           |

Table 2-79 shows: the percentage of good fitness of middle age adults (40-59) is larger than that of younger people. As for SRT and OFSEC, the percentage of "Badly poor" for middle age adults is smaller than those of younger people.

### 2.7.3 Fitness categories of different occupation holders

The result shows that the percentage of "Average category" for non physical workers is nearly equal to that of physical workers, which suggest that occupation has no remarkable effect on fitness.

Table 2-80 Fitness categories for different occupation holders (%)

| Sex | Fitness categories | Physical workers | non physical workers |
|-----|--------------------|------------------|----------------------|
| Men | Poor               | 6.7              | 6.5                  |
|     | Average            | 44.5             | 43.5                 |
|     | Good               | 27.8             | 27.8                 |
|     | Excellent          | 21.0             | 22.2                 |

|       |           |      |      |
|-------|-----------|------|------|
| Women | Poor      | 5.8  | 6.0  |
|       | Average   | 47.3 | 49.7 |
|       | Good      | 29.9 | 28.6 |
|       | Excellent | 17.0 | 15.7 |

#### 2.7.4 Comparative analysis of fitness categories between Macao and the Mainland

Table 2-81 Fitness categories for Macao and some provinces and cities of the Mainland (%)

| Sex   | Fitness categories | Beijing | Changchun | Shanghai | Guangzhou | Chengdu | Lanzhou | Macao |
|-------|--------------------|---------|-----------|----------|-----------|---------|---------|-------|
| Men   | Poor               | 9.2     | 7.6       | 6.0      | 8.1       | 12.8    | 10.5    | 21.5  |
|       | Average            | 48.7    | 53.3      | 49.1     | 51.3      | 55.1    | 55.9    | 27.8  |
|       | Good               | 27.6    | 26.4      | 29.9     | 26.9      | 21.8    | 21.3    | 44.1  |
|       | Excellent          | 14.5    | 12.8      | 15.0     | 13.7      | 10.3    | 12.2    | 6.7   |
| Women | Poor               | 8.4     | 12.0      | 7.7      | 8.9       | 10.7    | 14.4    | 16.3  |
|       | Average            | 47.3    | 54.7      | 53.2     | 50.2      | 58.7    | 57.1    | 29.2  |
|       | Good               | 27.5    | 22.3      | 27.1     | 26.7      | 22.0    | 19.8    | 48.6  |
|       | Excellent          | 16.8    | 11.0      | 12.0     | 14.2      | 8.7     | 8.8     | 5.9   |

Compared with the results of the mainland, the percentage of "Poor" category in Macao is remarkably larger than that of the Mainland. For example, the percentage of "Poor" for men in Macao is 8.7% higher than that of Guangzhou, Macao's neighboring city. But the percentage of "Good" for Macao ranks the first.

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**PART THREE      Results Tables**

## PART THREE: Results Tables

### 1. Tables of questionnaire results

Table 1 Education Distribution of the Samples (%)

| Sex   | Education          | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 | 50-54 | 55-59 | Total % |
|-------|--------------------|-------|-------|-------|-------|-------|-------|-------|-------|---------|
| Men   | Illiteracy         | 1.1   |       | 0.7   |       | 0.8   | 0.7   |       | 1.7   | 0.5     |
|       | Elementary school  | 8.7   | 9.2   | 14.4  | 24.0  | 32.9  | 37.7  | 31.0  | 18.6  | 23.6    |
|       | High school        | 54.9  | 51.6  | 45.6  | 56.1  | 57.0  | 57.2  | 63.2  | 76.3  | 55.5    |
|       | University/college | 34.8  | 37.6  | 32.2  | 15.2  | 7.1   | 2.4   | 4.5   | 3.4   | 17.5    |
|       | Master             | 0.5   | 1.6   | 6.7   | 4.4   | 2.3   | 2.0   | 1.3   |       | 2.8     |
|       | Doctor             |       |       | 0.4   | 0.3   |       |       |       |       |         |
| Women | Illiteracy         |       | 0.3   |       | 1.2   | 1.3   | 1.2   | 4.0   | 3.3   | 1.1     |
|       | Elementary school  | 1.1   | 2.8   | 5.4   | 21.6  | 32.4  | 41.5  | 55.3  | 40.0  | 22.2    |
|       | High school        | 47.9  | 45.6  | 58.2  | 59.8  | 54.5  | 51.9  | 38.7  | 48.9  | 51.6    |
|       | University/college | 50.5  | 48.4  | 30.0  | 15.2  | 9.9   | 5.0   | 1.5   | 7.8   | 22.8    |
|       | Master             | 0.5   | 2.8   | 6.4   | 2.1   | 1.9   | 0.4   | 0.5   |       | 2.2     |
|       |                    |       |       |       |       |       |       |       |       |         |

Table 2 Employment of the Samples (%)

| Sex   | Employment | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 | 50-54 | 55-59 | Total |
|-------|------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Men   | Full-time  | 80.9  | 96.8  | 94.8  | 97.4  | 95.2  | 96.2  | 91.9  | 71.7  | 93.7  |
|       | Part-time  | 7.5   | 2.4   | 1.9   | 1.8   | 3.0   | 2.4   | 5.4   | 7.5   | 3.2   |
|       | Jobless    | 11.6  | 0.8   | 3.3   | 0.9   | 1.8   | 1.4   | 2.7   | 20.8  | 3.1   |
| Women | Full-time  | 84.7  | 95.1  | 93.8  | 92.8  | 80.4  | 79.8  | 67.9  | 47.1  | 85.7  |
|       | Part-time  | 4.7   | 2.3   | 3.1   | 3.9   | 7.3   | 4.7   | 6.9   | 5.9   | 4.5   |
|       | Jobless    | 10.6  | 2.6   | 3.1   | 3.3   | 12.2  | 15.5  | 25.2  | 47.1  | 9.8   |

Table 3 Working Environment (%)

| Sex   | Working conditions           | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 | 50-54 | 55-59 | total |
|-------|------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Men   | Outdoor                      | 28.7  | 19.0  | 14.9  | 15.0  | 17.7  | 21.5  | 36.3  | 27.3  | 20.2  |
|       | Indoor<br>(ventilated)       | 16.5  | 4.8   | 5.2   | 7.4   | 8.2   | 10.0  | 21.9  | 11.4  | 9.3   |
|       | Indoor<br>(air-conditioning) | 54.9  | 76.2  | 79.9  | 77.6  | 74.0  | 68.5  | 41.8  | 61.4  | 70.5  |
| Women | Outdoor                      | 5.5   | 0.9   | 2.1   | 2.7   | 7.0   | 6.5   | 3.8   |       | 3.6   |
|       | Indoor<br>(Ventilated)       | 6.1   | 3.8   | 3.8   | 15.0  | 16.8  | 16.2  | 32.8  | 24.2  | 11.9  |
|       | Indoor<br>(Air-conditioning) | 88.3  | 95.3  | 94.1  | 82.4  | 76.2  | 77.3  | 63.4  | 75.8  | 84.5  |

Table 4 Percentages of Diseases (%)

| Sex   | Disease | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 | 50-54 | 55-59 | total |
|-------|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Men   | Yes     | 14.1  | 14.4  | 15.6  | 17.8  | 16.5  | 19.3  | 28.4  | 20.3  | 17.6  |
|       | No      | 85.9  | 85.6  | 84.4  | 82.2  | 83.5  | 80.7  | 71.6  | 79.7  | 82.4  |
| Women | Yes     | 16.8  | 12.8  | 16.2  | 23.2  | 25.6  | 34.0  | 43.2  | 36.7  | 24.0  |
|       | No      | 83.2  | 87.2  | 83.8  | 76.8  | 74.4  | 66.0  | 56.8  | 63.3  | 76.0  |

Note: In the past 5 years

Table 5 Distributions of Diseases (%)

| Sex   | Diseases                                | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 | 50-54 | 55-59 | Total |
|-------|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Men   | Cancer                                  |       | 5.9   | 4.9   | 1.8   | 1.7   | 1.9   |       |       | 2.2   |
|       | Circulatory diseases                    |       |       |       | 1.8   |       | 5.6   | 7.0   |       | 2.2   |
|       | Respiratory                             | 29.2  | 35.3  | 36.6  | 32.1  | 28.3  | 24.1  | 16.3  | 16.7  | 28.1  |
|       | Accidental hurt                         | 41.7  | 14.7  | 9.8   | 23.2  | 6.7   | 16.7  | 2.3   |       | 14.2  |
|       | Digestive system                        | 4.2   | 20.6  | 22.0  | 23.2  | 25.0  | 22.2  | 37.2  |       | 22.5  |
|       | High blood pressure                     | 8.3   | 5.9   | 2.4   | 3.6   | 8.3   | 11.1  | 20.9  | 25.0  | 9.3   |
|       | Endocrinopathy                          | 4.2   |       | 2.4   | 3.6   | 3.3   | 3.7   |       |       | 2.5   |
|       | urinary or reproductive system diseases |       | 2.9   |       |       |       | 8.3   | 7.0   | 16.7  | 3.4   |
|       | Diabetes                                |       |       |       | 3.6   | 5.0   | 1.9   | 2.3   | 16.7  | 2.8   |
|       | Other                                   | 12.5  | 14.7  | 22.0  | 7.1   | 13.3  | 13.0  | 7.0   | 25.0  | 13.0  |
| Women | Cancer                                  | 12.5  | 17.5  | 11.1  | 18.6  | 10.3  | 9.3   | 15.5  | 3.0   | 12.7  |
|       | Circulatory diseases                    | 3.1   |       | 2.2   | 1.4   | 5.1   | 6.7   | 1.2   | 12.1  | 3.7   |
|       | Respiratory                             | 18.8  | 30.0  | 20.0  | 10.0  | 9.0   | 4.0   | 4.8   | 9.1   | 11.2  |
|       | Accidental hurt                         | 15.6  | 5.0   | 8.9   | 2.9   | 2.6   | 2.7   | 1.2   | 3.0   | 4.2   |
|       | Digestive system                        | 31.3  | 25.0  | 26.7  | 25.7  | 24.4  | 16.0  | 15.5  | 6.1   | 21.0  |
|       | High blood pressure                     |       |       | 2.2   | 1.4   | 6.4   | 25.3  | 21.4  | 36.4  | 12.3  |
|       | Endocrinopathy                          | 9.4   | 12.5  | 22.2  | 10.0  | 6.4   | 8.0   | 10.7  | 3.0   | 10.1  |
|       | Urinary or reproductive system diseases | 3.1   |       |       | 5.7   | 12.8  | 8.0   | 4.8   | 9.1   | 6.1   |
|       | Diabetes                                |       |       |       |       |       | 4.0   | 4.8   | 3.0   | 1.8   |
|       | Other                                   | 6.3   | 10.0  | 6.7   | 24.3  | 23.1  | 16.0  | 20.2  | 15.2  | 17.1  |



Table 6 Cigarette smoking status (%)

| Sex   | Smoking | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 | 50-54 | 55-59 | Total |
|-------|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Men   | No      | 66.8  | 54.8  | 61.9  | 59.9  | 58.2  | 59.9  | 69.7  | 64.4  | 60.8  |
|       | Yes     | 27.2  | 34.0  | 21.9  | 28.7  | 30.6  | 29.6  | 16.8  | 16.9  | 27.5  |
|       | Ever    | 6.0   | 11.2  | 16.3  | 11.4  | 11.1  | 10.4  | 13.5  | 18.6  | 11.7  |
| Women | No      | 87.9  | 87.7  | 90.9  | 95.1  | 94.9  | 95.9  | 97.0  | 97.8  | 92.9  |
|       | Yes     | 7.9   | 9.1   | 7.1   | 3.0   | 3.2   | 2.9   | 1.0   | 2.2   | 4.9   |
|       | Ever    | 4.2   | 3.1   | 2.0   | 1.8   | 1.9   | 1.2   | 2.0   |       | 2.2   |

Table 7 Drink Status (%)

| Sex   | Drink | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 | 50-54 | 55-59 | Total |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Men   | No    | 39.7  | 46.0  | 48.1  | 48.0  | 52.7  | 60.6  | 52.3  | 64.4  | 50.7  |
|       | Yes   | 60.3  | 54.0  | 51.9  | 52.0  | 47.3  | 39.4  | 47.7  | 35.6  | 49.3  |
| Women | No    | 73.2  | 70.7  | 82.2  | 84.4  | 87.5  | 88.8  | 93.0  | 93.3  | 82.9  |
|       | Yes   | 26.8  | 29.3  | 17.8  | 15.6  | 12.5  | 11.2  | 7.0   | 6.7   | 17.1  |

Table 8 Frequency of Drinking (%)

| Sex   | Times (per month) | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 | 50-54 | 55-59 | Total |
|-------|-------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Men   | N                 | 111   | 134   | 140   | 178   | 187   | 117   | 74    | 21    | 962   |
|       | 1                 | 48.6  | 41.8  | 47.1  | 37.1  | 36.4  | 33.3  | 45.9  | 28.6  | 40.4  |
|       | 1-2               | 41.4  | 38.8  | 36.4  | 38.2  | 32.1  | 41.9  | 27.0  | 23.8  | 36.5  |
|       | 3-4               | 8.1   | 9.7   | 10.7  | 16.9  | 17.6  | 13.7  | 12.2  | 28.6  | 13.6  |
|       | 5-7               | 1.8   | 9.7   | 5.7   | 7.9   | 13.9  | 11.1  | 14.9  | 19.0  | 9.5   |
| Women |                   | 48.0  | 99.0  | 52.0  | 50.0  | 38.0  | 25.0  | 14.0  | 6.0   | 332   |
|       | 1                 | 66.7  | 62.6  | 63.5  | 58.0  | 55.3  | 48.0  | 64.3  | 33.3  | 60.3  |
|       | 1-2               | 29.2  | 29.3  | 26.9  | 26.0  | 34.2  | 32.0  | 21.4  | 16.7  | 28.6  |
|       | 3-4               |       | 5.1   | 3.8   | 8.0   | 2.6   |       |       | 33.3  | 4.2   |
|       | 5-7               | 4.2   | 3.0   | 5.8   | 8.0   | 7.9   | 20.0  | 14.3  | 16.7  | 6.9   |

Table 9 Types of Drink (%)

| Sex   | Types           | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 | 50-54 | 55-59 | Total |
|-------|-----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Men   | Alcohol         | 0.9   |       | 1.4   | 2.3   | 2.7   | 3.4   | 4.1   | 4.8   | 2.1   |
|       | Beer            | 94.5  | 93.2  | 85.0  | 83.1  | 87.1  | 83.8  | 80.8  | 61.9  | 86.3  |
|       | Yellow wine     |       | 0.8   | 0.7   | 1.7   | 0.5   | 0.9   |       |       | 0.7   |
|       | Rice wine       |       |       | 1.4   | 1.1   | 1.6   |       | 4.1   |       | 1.0   |
|       | Wine or Ratafee | 3.6   | 3.8   | 7.9   | 7.9   | 4.3   | 7.7   | 6.8   | 28.6  | 6.5   |
|       | Mixed wine      | 0.9   | 2.3   | 3.6   | 4.0   | 3.8   | 4.3   | 4.1   | 4.8   | 3.3   |
| Women | Alcohol         | 4.0   |       | 1.9   |       |       | 8.0   |       |       | 1.5   |
|       | Beer            | 80.0  | 71.7  | 53.8  | 60.0  | 67.6  | 60.0  | 28.6  | 16.7  | 64.3  |
|       | Yellow wine     |       |       | 1.9   | 2.0   |       |       | 14.3  |       | 1.2   |
|       | Rice wine       |       | 1.0   |       | 2.0   | 2.7   |       | 14.3  |       | 1.5   |
|       | Wine or Ratafee | 14.0  | 21.2  | 28.8  | 30.0  | 18.9  | 24.0  | 42.9  | 66.7  | 24.3  |
|       | Mixed wine      | 2.0   | 6.1   | 13.5  | 6.0   | 10.8  | 8.0   |       | 16.7  | 7.2   |

Table 10 Do you participate in exercises every week?(%)

| Sex   |        | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 | 50-54 | 55-59 | Total |
|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Men   | Yes    | 77.2  | 59.2  | 52.6  | 48.8  | 55.7  | 53.9  | 56.8  | 59.3  | 56.5  |
|       | No     | 22.8  | 40.8  | 47.4  | 51.2  | 44.3  | 46.1  | 43.2  | 40.7  | 43.5  |
|       | Total  | 100   | 100   | 100   | 100   | 100   | 100   | 100   | 100   | 100   |
| Women | Yes    | 44.7  | 40.7  | 41.1  | 38.4  | 43.5  | 49.8  | 54.3  | 72.2  | 45.0  |
|       | No     | 55.3  | 59.3  | 58.9  | 61.6  | 56.5  | 50.2  | 45.7  | 27.8  | 55.0  |
|       | Ttotal | 100   | 100   | 100   | 100   | 100   | 100   | 100   | 100   | 100   |

Table 11 Percentage for sports watching (%)

| Sex                | Exercises          | 20-24      | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 | 50-54 | 55-59 | Total |
|--------------------|--------------------|------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Men                | Basketball         | 37.0       | 18.0  | 19.7  | 13.3  | 16.9  | 16.5  | 19.0  | 17.6  | 19.0  |
|                    | Volleyball         | 4.9        | 6.7   | 8.7   | 10.4  | 7.6   | 7.0   | 13.9  | 11.8  | 8.4   |
|                    | Soccer             | 41.8       | 52.3  | 44.5  | 53.5  | 52.0  | 46.5  | 43.8  | 43.1  | 48.5  |
|                    | Gymnastics         | 0.5        | 1.3   | 0.8   | 5.1   | 2.8   | 4.8   | 3.6   | 2.0   | 2.8   |
|                    | Swimming           | 4.9        | 5.4   | 8.3   | 6.0   | 7.6   | 7.7   | 3.6   | 11.8  | 6.7   |
|                    | Wushu              | 4.9        | 3.3   | 5.1   | 3.2   | 3.1   | 4.8   | 4.4   | 7.8   | 4.1   |
|                    | Boxing             | 0.5        | 2.9   | 2.8   | 1.6   | 2.3   | 2.6   | 0.7   | 2.0   | 2.0   |
|                    | Table tennis       | 1.6        | 2.5   | 1.2   | 0.9   | 2.5   | 3.7   | 1.5   | 2.0   | 2.0   |
|                    | Billiards          |            | 0.8   | 0.4   |       | 0.3   | 0.4   |       |       | 0.3   |
|                    | Golf               |            | 0.4   | 0.4   |       |       |       |       |       | 0.1   |
|                    | Badminton          | 1.1        | 2.5   | 1.6   | 1.3   | 1.4   | 1.5   | 2.2   |       | 1.5   |
|                    | Baseball           |            |       | 0.4   |       |       |       |       |       | 0.1   |
|                    | Weight Lifting     |            |       |       | 0.3   |       | 0.4   |       |       | 0.1   |
|                    | Fence-play         | 0.5        |       |       |       |       |       |       |       | 0.1   |
|                    | Wrestling and judo | 0.5        | 0.4   | 1.2   |       |       |       | 0.7   |       | 0.3   |
|                    | Other              | 1.6        | 3.3   | 5.1   | 4.4   | 3.4   | 4.4   | 6.6   | 2.0   | 4.0   |
|                    | Women              | Basketball | 21.4  | 9.7   | 11.5  | 8.4   | 11.6  | 13.6  | 10.2  | 10.0  |
| Volleyball         |                    | 26.6       | 35.1  | 34.0  | 31.3  | 17.0  | 16.6  | 14.8  | 15.0  | 26.3  |
| Soccer             |                    | 8.7        | 10.4  | 9.5   | 8.4   | 12.1  | 11.8  | 10.9  | 5.0   | 10.0  |
| Gymnastics         |                    | 13.3       | 11.4  | 14.2  | 12.9  | 22.3  | 20.1  | 23.4  | 21.7  | 16.2  |
| Swimming           |                    | 16.8       | 18.8  | 17.8  | 23.3  | 24.1  | 21.3  | 20.3  | 18.3  | 20.3  |
| WWushu             |                    | 1.7        | 1.0   | 2.0   | 3.2   | 4.0   | 6.5   | 9.4   | 23.3  | 4.2   |
| Boxing             |                    |            |       | 0.4   | 0.8   |       |       |       | 1.7   | 0.3   |
| Table tennis       |                    | 1.7        | 3.2   | 2.8   | 4.0   | 3.1   | 1.2   |       |       | 2.5   |
| Bbilliards         |                    | 0.6        | 0.6   |       |       |       |       |       |       | 0.2   |
| Golf               |                    |            | 0.6   | 0.8   | 0.8   | 0.9   |       |       |       | 0.5   |
| Badminton          |                    | 3.5        | 4.2   | 4.0   | 4.0   | 1.8   | 1.8   |       | 3.3   | 3.1   |
| Water polp         |                    |            | 0.3   |       |       |       |       |       |       | 0.1   |
| Softball           |                    |            |       | 0.4   |       |       |       |       |       | 0.1   |
| weight lifting     |                    |            |       |       | 0.4   |       |       |       |       | 0.1   |
| fence-play         |                    | 0.6        |       |       |       |       |       |       |       | 0.1   |
| wrestling and judo |                    | 1.2        | 0.3   |       |       |       |       |       |       | 0.2   |
| other              |                    | 4.0        | 4.2   | 2.8   | 2.4   | 3.1   | 7.1   | 10.9  | 1.7   | 4.3   |

Table12 Percentages for various exercises participating (%)

| Sex   | Exercises      | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 | 50-54 | 55-59) | Total |
|-------|----------------|-------|-------|-------|-------|-------|-------|-------|--------|-------|
| Men   | Basketball     | 36.4  | 14.3  | 12.7  | 7.9   | 7.6   | 6.2   | 7.7   | 16.7   | 13.9  |
|       | Volleyball     | 2.3   |       |       |       | 1.0   |       |       |        | 0.5   |
|       | Soccer         | 25.0  | 46.4  | 22.5  | 24.7  | 11.4  | 21.5  | 7.7   |        | 23.1  |
|       | Gymnastics     |       | 1.2   | 1.4   | 2.2   | 1.9   | 1.5   | 5.1   | 16.7   | 2.0   |
|       | Swimming       | 12.5  | 3.6   | 21.1  | 18.0  | 16.2  | 13.8  | 25.6  | 33.3   | 15.4  |
|       | Wushu          | 2.3   | 3.6   |       | 2.2   | 2.9   | 10.8  | 7.7   | 8.3    | 3.8   |
|       | Boxing         |       | 1.2   |       | 1.1   |       |       |       |        | 0.4   |
|       | Table tennis   | 1.1   | 2.4   | 2.8   | 1.1   | 4.8   | 3.1   |       |        | 2.4   |
|       | Billiards      |       |       | 2.8   | 3.4   | 1.9   |       | 2.6   |        | 1.4   |
|       | Golf           | 5.7   | 2.4   | 2.8   | 3.4   | 2.9   | 3.1   | 2.6   |        | 3.3   |
|       | Weight lifting |       |       | 1.4   | 3.4   | 1.9   |       | 2.6   |        | 1.3   |
|       | Other          | 1.1   | 6.0   | 9.9   | 7.9   | 9.5   | 3.1   | 2.6   | 8.3    | 6.1   |
|       | Jogging        | 12.5  | 16.7  | 19.7  | 23.6  | 37.1  | 32.3  | 30.8  | 16.7   | 24.2  |
|       | Hike           | 1.1   | 2.4   | 2.8   | 1.1   | 1.0   | 4.6   | 5.1   |        | 2.2   |
|       | Ttotal         | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0  | 100.0 |
| Women | Basketball     | 3.7   | 2.0   | 3.3   | 4.2   |       | 7.1   |       |        | 2.9   |
|       | Volleyball     | 3.7   | 8.0   | 3.3   | 8.3   |       |       |       |        | 4.7   |
|       | Gymnastics     | 7.4   | 8.0   | 10.0  | 4.2   | 18.8  | 14.3  | 37.5  | 50.0   | 11.1  |
|       | Swimming       | 29.6  | 26.0  | 40.0  | 58.3  | 37.5  | 21.4  | 12.5  |        | 33.3  |
|       | Wushu          | 3.7   | 2.0   |       |       | 12.5  | 7.1   | 25.0  | 50.0   | 4.7   |
|       | Table tennis   | 3.7   | 2.0   |       |       | 12.5  |       |       |        | 2.3   |
|       | Golf           |       | 2.0   |       |       |       |       |       |        | 0.6   |
|       | Badminton      | 11.1  | 8.0   | 6.7   |       |       |       |       |        | 5.3   |
|       | Weight lifting | 3.7   |       | 3.3   |       |       |       |       |        | 1.2   |
|       | Other          | 18.5  | 10.0  | 6.7   | 8.3   |       | 7.1   | 12.5  |        | 9.4   |
|       | Jogging        | 14.8  | 32.0  | 26.7  | 16.7  | 12.5  | 21.4  | 12.5  |        | 22.2  |
|       | Hike           |       |       |       |       | 6.3   | 21.4  |       |        | 2.3   |
|       | Total          | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0  | 100.0 |

Table 13 Reasons for none exercises participation (%)

| Sex   | Reasons         | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 | 50-54 | 55-59 | Total |
|-------|-----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Men   | No interest     | 11.9  | 16.7  | 12.5  | 11.5  | 17.1  | 11.1  | 17.2  | 25.0  | 14.2  |
|       | No space        | 4.8   | 12.7  | 9.4   | 6.3   | 4.0   | 4.4   | 4.7   | 8.3   | 6.6   |
|       | Heavy housework | 4.8   | 2.0   | 7.8   | 9.2   | 9.7   | 15.6  | 1.6   |       | 8.2   |
|       | No instruction  | 11.9  | 1.0   | 3.1   | 2.9   | 4.6   | 2.2   | 6.3   |       | 3.6   |
|       | Busy work       | 47.6  | 54.9  | 59.4  | 63.8  | 57.1  | 55.6  | 67.2  | 50.0  | 58.4  |
|       | Other           | 19.0  | 12.7  | 7.8   | 6.3   | 7.4   | 11.1  | 3.1   | 16.7  | 9.0   |
|       | Total           | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Women | No interest     | 21.2  | 19.9  | 13.5  | 11.9  | 14.8  | 16.0  | 28.7  | 16.7  | 16.9  |
|       | No space        | 9.6   | 5.8   | 4.1   | 4.0   | 6.3   | 0.8   | 3.4   | 4.2   | 4.9   |
|       | Heavy housework | 3.8   | 6.8   | 14.0  | 26.2  | 19.3  | 24.4  | 21.8  | 37.5  | 17.1  |
|       | No instruction  |       | 2.9   | 4.7   | 4.5   | 4.0   | 6.7   | 4.6   | 4.2   | 3.9   |
|       | Busy work       | 51.9  | 54.9  | 56.7  | 46.5  | 47.2  | 47.1  | 33.3  | 29.2  | 48.9  |
|       | Other           | 13.5  | 9.7   | 7.0   | 6.9   | 8.5   | 5.0   | 8.0   | 8.3   | 8.3   |
|       | Total           | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Table 14 Time spent for exercises

| Sex   | Time                 | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 | 50-54 | 55-59 | Total |
|-------|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Men   | 60 minutes more      | 47.1  | 40.8  | 34.8  | 22.8  | 21.9  | 22.6  | 21.8  | 34.3  | 30.0  |
|       | 30-60 minutes        | 45.7  | 42.9  | 41.3  | 60.5  | 51.6  | 54.2  | 49.4  | 51.4  | 49.9  |
|       | Less than 30 minutes | 7.1   | 16.3  | 23.9  | 16.7  | 26.5  | 23.2  | 28.7  | 14.3  | 20.1  |
|       | Total                | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Women | 60 minutes more      | 31.3  | 25.4  | 27.1  | 22.0  | 23.1  | 31.9  | 43.7  | 44.4  | 29.7  |
|       | 30-60 minutes        | 44.6  | 49.3  | 50.0  | 50.4  | 46.3  | 47.9  | 38.8  | 44.4  | 46.9  |
|       | Less than 30 minutes | 24.1  | 25.4  | 22.9  | 27.6  | 30.6  | 20.2  | 17.5  | 11.1  | 23.4  |
|       | Total                | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Table 15 Frequency of exercise participation per week (%)

| Sex   | Frequencies  | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 | 50-54 | 55-59 | Total |
|-------|--------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Men   | 1-2 times    | 53.9  | 64.2  | 74.8  | 58.5  | 53.9  | 44.9  | 46.0  | 14.3  | 55.5  |
|       | 3-4 times    | 27.7  | 25.7  | 21.6  | 36.6  | 29.0  | 35.3  | 25.3  | 34.3  | 29.3  |
|       | 5 times more | 18.4  | 10.1  | 3.6   | 4.9   | 17.1  | 19.9  | 28.7  | 51.4  | 15.2  |
|       | Total        | 100   | 100   | 100   | 100   | 100   | 100   | 100   | 100   | 100   |
| Women | 1-2 times    | 60.2  | 75.7  | 68.9  | 57.3  | 40.7  | 35.3  | 18.4  | 10.9  | 48.7  |
|       | 3-4 times    | 31.3  | 20.0  | 25.2  | 28.2  | 30.4  | 23.5  | 29.1  | 17.2  | 25.8  |
|       | 5 times more | 8.4   | 4.3   | 5.9   | 14.5  | 28.9  | 41.2  | 52.4  | 71.9  | 25.5  |
|       | Total        | 100   | 100   | 100   | 100   | 100   | 100   | 100   | 100   | 100   |

Table 16 Purposes for exercise participation (%)

| Sex   | Purposes         | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 | 50-54 | 55-59 | Total |
|-------|------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Men   | Fitness          | 56.7  | 57.4  | 65.5  | 72.0  | 69.9  | 76.0  | 89.5  | 80.0  | 69.0  |
|       | Shaping          | 5.7   | 7.4   | 12.2  | 7.9   | 8.2   | 9.7   | 4.7   | 11.4  | 8.3   |
|       | Disease recovery |       |       | 1.4   |       | 2.3   | 1.3   | 2.3   | 2.9   | 1.1   |
|       | Competition      | 12.1  | 9.5   | 4.3   | 1.8   | 2.3   | 5.2   |       |       | 4.9   |
|       | Recreation       | 21.3  | 23.0  | 14.4  | 17.1  | 15.5  | 7.1   | 3.5   | 5.7   | 14.9  |
|       | Sociality        | 0.7   |       |       | 0.6   | 0.9   |       |       |       | 0.4   |
|       | Other            | 3.5   | 2.7   | 2.2   | 0.6   | 0.9   | 0.6   |       |       | 1.5   |
|       | Total            | 100   | 100   | 100   | 100   | 100   | 100   | 100   | 100   | 100   |
| Women | Fitness          | 34.9  | 53.6  | 60.0  | 64.5  | 73.3  | 75.6  | 73.1  | 90.6  | 65.1  |
|       | Shaping          | 39.8  | 28.6  | 25.8  | 22.6  | 13.3  | 14.3  | 7.7   | 4.7   | 20.0  |
|       | Disease recovery |       | 0.7   | 1.7   | 4.0   | 3.0   | 3.4   | 10.6  | 1.6   | 3.1   |
|       | Competition      | 3.6   | 3.6   | 1.7   | 0.8   |       |       |       |       | 1.2   |
|       | Recreation       | 14.5  | 7.9   | 10.8  | 5.6   | 5.9   | 4.2   | 5.8   | 3.1   | 7.2   |
|       | Sociality        |       |       |       |       | 1.5   | 0.8   | 1.0   |       | 0.4   |
|       | Other            | 7.2   | 5.7   |       | 2.4   | 3.0   | 1.7   | 1.9   |       | 2.8   |
|       | total            | 100   | 100   | 100   | 100   | 100   | 100   | 100   | 100   | 100   |

Table 17 Locations for exercises

| Sex   | Locations        | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 | 50-54 | 55-59 | Total |
|-------|------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Men   | Stadium or arena | 50.6  | 50.0  | 43.1  | 19.8  | 16.2  | 20.3  | 12.2  | 38.5  | 31.5  |
|       | Park             | 18.0  | 20.2  | 18.1  | 38.5  | 41.9  | 56.3  | 43.9  | 23.1  | 32.6  |
|       | Office or home   | 1.1   | 1.2   |       | 5.5   | 5.7   | 7.8   | 9.8   | 23.1  | 4.5   |
|       | Public space     | 20.2  | 9.5   | 12.5  | 8.8   | 13.3  | 6.3   | 7.3   | 7.7   | 11.6  |
|       | Road or street   | 2.2   | 7.1   | 13.9  | 12.1  | 16.2  | 4.7   | 9.8   | 7.7   | 9.7   |
|       | Club             | 2.2   | 1.2   | 8.3   | 8.8   | 3.8   |       | 7.3   |       | 4.3   |
|       | Other            | 5.6   | 10.7  | 4.2   | 6.6   | 2.9   | 4.7   | 9.8   |       | 5.9   |
|       | Total            | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Women | Stadium or arena | 32.1  | 23.5  | 19.4  | 32.0  | 25.0  | 28.6  |       |       | 24.6  |
|       | Park             | 17.9  | 17.6  | 19.4  | 36.0  | 50.0  | 21.4  | 75.0  | 100.0 | 27.4  |
|       | Office or home   | 14.3  | 3.9   | 6.5   | 8.0   | 12.5  | 7.1   | 12.5  |       | 8.0   |
|       | Public space     | 3.6   | 9.8   | 6.5   | 4.0   |       | 21.4  |       |       | 6.9   |
|       | Road or street   | 7.1   | 3.9   | 6.5   | 12.0  |       | 14.3  |       |       | 6.3   |
|       | Club             | 21.4  | 21.6  | 32.3  | 4.0   | 6.3   | 7.1   |       |       | 17.1  |
|       | Other            | 3.6   | 19.6  | 9.7   | 4.0   | 6.3   |       | 12.5  |       | 9.7   |
|       | Total            | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

## 2. Tables of Testing Results

Table 1 Heart rates (at resting) (times per minute)

| Sex | Age | N   | $\bar{X}$ | SD   | P <sub>3</sub> | P <sub>10</sub> | P <sub>25</sub> | P <sub>35</sub> | P <sub>50</sub> | P <sub>65</sub> | P <sub>75</sub> | P <sub>90</sub> | P <sub>97</sub> |
|-----|-----|-----|-----------|------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Men | 20~ | 184 | 70.3      | 9.9  | 54.2           | 60.0            | 62.5            | 65.5            | 70.0            | 73.3            | 76.0            | 84.0            | 92.0            |
|     | 25~ | 250 | 72.1      | 9.7  | 56.0           | 60.0            | 64.0            | 68.0            | 72.0            | 76.0            | 78.0            | 84.0            | 96.0            |
|     | 30~ | 270 | 72.5      | 9.4  | 56.0           | 62.0            | 66.0            | 68.0            | 72.0            | 76.0            | 78.5            | 84.0            | 90.0            |
|     | 35~ | 342 | 73.1      | 9.6  | 58.0           | 62.0            | 66.0            | 68.0            | 72.0            | 76.0            | 80.0            | 86.0            | 94.0            |
|     | 40~ | 395 | 73.1      | 9.5  | 58.0           | 62.0            | 66.0            | 68.0            | 72.0            | 76.0            | 80.0            | 86.0            | 92.0            |
|     | 45~ | 297 | 73.7      | 10.1 | 57.9           | 62.0            | 66.0            | 68.0            | 72.0            | 76.0            | 80.0            | 88.0            | 96.0            |
|     | 50~ | 155 | 71.9      | 9.0  | 56.0           | 60.0            | 66.0            | 68.0            | 71.0            | 76.0            | 78.0            | 84.8            | 88.6            |
|     | 55~ | 59  | 70.6      | 9.3  | 53.6           | 60.0            | 64.0            | 66.0            | 70.0            | 72.0            | 78.0            | 84.0            | 91.2            |

|       |     |     |      |     |      |      |      |      |      |      |      |      |      |
|-------|-----|-----|------|-----|------|------|------|------|------|------|------|------|------|
| Women | 20~ | 190 | 73.5 | 8.6 | 60.0 | 62.0 | 68.0 | 70.0 | 74.0 | 76.0 | 80.0 | 85.8 | 92.0 |
|       | 25~ | 351 | 72.7 | 8.0 | 60.0 | 62.0 | 66.0 | 69.2 | 72.0 | 76.0 | 78.0 | 84.0 | 88.0 |
|       | 30~ | 297 | 72.2 | 7.8 | 58.0 | 62.0 | 66.0 | 68.0 | 72.0 | 76.0 | 78.0 | 82.0 | 86.1 |
|       | 35~ | 328 | 71.9 | 8.1 | 58.0 | 62.0 | 66.0 | 68.0 | 72.0 | 74.0 | 78.0 | 82.0 | 88.0 |
|       | 40~ | 313 | 71.8 | 8.2 | 56.8 | 62.0 | 66.0 | 68.0 | 72.0 | 74.0 | 78.0 | 82.0 | 88.0 |
|       | 45~ | 241 | 70.8 | 7.7 | 58.0 | 60.0 | 66.0 | 68.0 | 70.0 | 74.0 | 76.0 | 80.0 | 86.0 |
|       | 50~ | 199 | 71.2 | 8.2 | 58.0 | 62.0 | 66.0 | 68.0 | 70.0 | 72.0 | 76.0 | 82.0 | 88.0 |
|       | 55~ | 90  | 71.0 | 8.4 | 57.5 | 60.0 | 64.0 | 68.0 | 70.0 | 74.0 | 78.0 | 82.0 | 88.5 |

Table 2 Systolic pressure (mmHg)

| Sex   | Age | N   | $\bar{X}$ | SD   | P <sub>3</sub> | P <sub>10</sub> | P <sub>25</sub> | P <sub>35</sub> | P <sub>50</sub> | P <sub>65</sub> | P <sub>75</sub> | P <sub>90</sub> | P <sub>97</sub> |
|-------|-----|-----|-----------|------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Men   | 20~ | 184 | 120.3     | 13.1 | 100.0          | 106.0           | 110.0           | 112.0           | 120.0           | 122.0           | 128.0           | 140.0           | 148.9           |
|       | 25~ | 250 | 124.2     | 13.4 | 100.0          | 110.0           | 114.0           | 120.0           | 122.0           | 130.0           | 132.0           | 142.0           | 152.0           |
|       | 30~ | 270 | 123.1     | 12.9 | 100.0          | 110.0           | 112.0           | 118.0           | 122.0           | 130.0           | 132.0           | 140.0           | 150.0           |
|       | 35~ | 342 | 126.4     | 14.0 | 103.2          | 110.0           | 118.0           | 120.0           | 124.0           | 130.0           | 134.0           | 145.4           | 156.0           |
|       | 40~ | 395 | 128.0     | 15.8 | 100.0          | 110.0           | 118.0           | 122.0           | 128.0           | 132.0           | 136.0           | 148.0           | 162.0           |
|       | 45~ | 297 | 127.9     | 15.0 | 102.0          | 110.0           | 118.0           | 120.0           | 128.0           | 132.0           | 139.0           | 148.0           | 160.0           |
|       | 50~ | 155 | 131.1     | 17.3 | 102.0          | 110.0           | 120.0           | 124.0           | 130.0           | 136.0           | 140.0           | 152.0           | 173.2           |
|       | 55~ | 59  | 130.7     | 18.7 | 100.0          | 106.0           | 116.0           | 120.0           | 130.0           | 140.0           | 142.0           | 160.0           | 162.4           |
| Women | 20~ | 190 | 107.0     | 9.4  | 90.0           | 96.0            | 100.0           | 102.0           | 108.0           | 110.0           | 112.0           | 119.8           | 126.5           |
|       | 25~ | 351 | 107.4     | 10.0 | 90.0           | 94.4            | 100.0           | 102.0           | 108.0           | 110.0           | 112.0           | 122.0           | 128.9           |
|       | 30~ | 297 | 108.4     | 12.8 | 90.0           | 94.0            | 100.0           | 102.0           | 110.0           | 110.0           | 114.0           | 122.0           | 132.2           |
|       | 35~ | 328 | 111.0     | 13.1 | 90.0           | 96.0            | 102.0           | 106.0           | 110.0           | 112.0           | 120.0           | 130.0           | 140.0           |
|       | 40~ | 313 | 114.5     | 13.6 | 92.0           | 100.0           | 104.0           | 109.8           | 112.0           | 120.0           | 122.0           | 132.0           | 145.2           |
|       | 45~ | 241 | 120.4     | 16.3 | 96.0           | 102.0           | 110.0           | 112.0           | 120.0           | 122.0           | 130.0           | 140.0           | 160.0           |
|       | 50~ | 199 | 124.1     | 18.7 | 90.0           | 102.0           | 110.0           | 116.0           | 120.0           | 130.0           | 136.0           | 150.0           | 162.0           |
|       | 55~ | 90  | 129.6     | 19.9 | 90.0           | 102.4           | 112.0           | 120.0           | 130.0           | 140.0           | 144.0           | 155.6           | 167.1           |

Table 3 Diastolic pressure (mmHg)

| Sex | Age | N   | $\bar{X}$ | SD   | P <sub>3</sub> | P <sub>10</sub> | P <sub>25</sub> | P <sub>35</sub> | P <sub>50</sub> | P <sub>65</sub> | P <sub>75</sub> | P <sub>90</sub> | P <sub>97</sub> |
|-----|-----|-----|-----------|------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Men | 20~ | 184 | 75.4      | 8.3  | 60.0           | 64.0            | 70.0            | 72.0            | 76.0            | 80.0            | 80.0            | 87.0            | 90.0            |
|     | 25~ | 250 | 79.2      | 9.1  | 60.0           | 68.0            | 72.0            | 76.0            | 80.0            | 82.0            | 88.0            | 90.0            | 96.0            |
|     | 30~ | 270 | 79.7      | 9.2  | 60.0           | 68.0            | 72.0            | 78.0            | 80.0            | 84.0            | 88.0            | 90.0            | 98.0            |
|     | 35~ | 342 | 82.6      | 9.3  | 62.0           | 70.0            | 78.0            | 80.0            | 82.0            | 86.0            | 88.0            | 94.0            | 100.0           |
|     | 40~ | 395 | 83.6      | 9.6  | 66.0           | 70.0            | 78.0            | 80.0            | 82.0            | 88.0            | 90.0            | 96.0            | 100.0           |
|     | 45~ | 297 | 84.0      | 9.5  | 66.0           | 72.0            | 78.0            | 80.0            | 82.0            | 88.0            | 90.0            | 96.0            | 100.0           |
|     | 50~ | 155 | 86.0      | 10.4 | 68.0           | 72.0            | 80.0            | 80.0            | 86.0            | 90.0            | 94.0            | 100.0           | 105.9           |
|     | 55~ | 59  | 84.3      | 9.8  | 63.2           | 70.0            | 78.0            | 82.0            | 86.0            | 90.0            | 90.0            | 96.0            | 102.4           |



|       |     |     |      |      |      |      |      |      |      |      |      |      |       |
|-------|-----|-----|------|------|------|------|------|------|------|------|------|------|-------|
| Women | 20~ | 190 | 69.4 | 8.4  | 53.5 | 58.2 | 62.0 | 67.7 | 70.0 | 72.0 | 74.0 | 80.0 | 84.0  |
|       | 25~ | 351 | 69.6 | 8.1  | 56.0 | 60.0 | 64.0 | 66.4 | 70.0 | 72.0 | 74.0 | 80.0 | 84.9  |
|       | 30~ | 297 | 70.3 | 7.9  | 58.0 | 60.0 | 64.0 | 68.0 | 70.0 | 72.0 | 76.0 | 80.0 | 86.1  |
|       | 35~ | 328 | 72.2 | 9.2  | 54.0 | 60.0 | 66.0 | 70.0 | 72.0 | 76.0 | 80.0 | 82.0 | 90.3  |
|       | 40~ | 313 | 75.5 | 9.7  | 58.0 | 64.0 | 70.0 | 70.0 | 74.0 | 80.0 | 81.0 | 88.0 | 95.2  |
|       | 45~ | 241 | 78.1 | 10.6 | 60.0 | 64.4 | 70.0 | 74.0 | 78.0 | 80.0 | 86.0 | 92.0 | 100.0 |
|       | 50~ | 199 | 79.4 | 10.3 | 60.0 | 66.0 | 72.0 | 76.0 | 80.0 | 82.0 | 88.0 | 90.0 | 100.0 |
|       | 55~ | 90  | 81.9 | 11.8 | 60.0 | 68.0 | 72.0 | 78.0 | 80.0 | 88.0 | 88.5 | 98.0 | 102.0 |

Table 4 Vital capacity (ml)

| Sex   | Age | N   | $\bar{X}$ | SD    | P <sub>3</sub> | P <sub>10</sub> | P <sub>25</sub> | P <sub>35</sub> | P <sub>50</sub> | P <sub>65</sub> | P <sub>75</sub> | P <sub>90</sub> | P <sub>97</sub> |
|-------|-----|-----|-----------|-------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Men   | 20~ | 184 | 3973.0    | 729.0 | 2607           | 3085            | 3459            | 3650            | 3925            | 4263            | 4405            | 4918            | 5467            |
|       | 25~ | 250 | 3767.9    | 777.4 | 2536           | 2801            | 3237            | 3394            | 3703            | 4047            | 4246            | 4777            | 5421            |
|       | 30~ | 270 | 3619.9    | 789.0 | 2315           | 2652            | 3124            | 3300            | 3520            | 3897            | 4086            | 4490            | 5385            |
|       | 35~ | 342 | 3479.1    | 739.4 | 2282           | 2703            | 2949            | 3160            | 3375            | 3670            | 3970            | 4437            | 4984            |
|       | 40~ | 395 | 3296.8    | 690.1 | 2154           | 2450            | 2805            | 3000            | 3255            | 3502            | 3730            | 4120            | 4694            |
|       | 45~ | 297 | 3267.9    | 659.6 | 2143           | 2484            | 2843            | 2992            | 3200            | 3459            | 3658            | 4124            | 4800            |
|       | 50~ | 155 | 3292.2    | 864.2 | 1990           | 2253            | 2705            | 2850            | 3210            | 3514            | 3775            | 4480            | 5229            |
|       | 55~ | 59  | 3036.3    | 677.5 | 1989           | 2165            | 2450            | 2680            | 3020            | 3230            | 3565            | 3985            | 4409            |
| Women | 20~ | 190 | 2617.0    | 535.6 | 1737           | 2032            | 2195            | 2375            | 2570            | 2806            | 2939            | 3285            | 3852            |
|       | 25~ | 351 | 2512.6    | 539.7 | 1633           | 1892            | 2135            | 2265            | 2475            | 2658            | 2805            | 3243            | 3617            |
|       | 30~ | 297 | 2550.4    | 652.9 | 1515           | 1888            | 2145            | 2250            | 2420            | 2678            | 2885            | 3390            | 4137            |
|       | 35~ | 328 | 2392.9    | 579.2 | 1423           | 1730            | 2008            | 2130            | 2330            | 2570            | 2735            | 3131            | 3665            |
|       | 40~ | 313 | 2356.7    | 545.4 | 1397           | 1715            | 2013            | 2120            | 2280            | 2481            | 2688            | 3069            | 3623            |
|       | 45~ | 240 | 2230.5    | 538.8 | 1256           | 1566            | 1900            | 2027            | 2170            | 2362            | 2528            | 3049            | 3354            |
|       | 50~ | 199 | 2170.0    | 553.1 | 1250           | 1535            | 1770            | 1940            | 2115            | 2250            | 2465            | 2940            | 3475            |
|       | 55~ | 90  | 1940.4    | 654.8 | 1062           | 1265            | 1550            | 1685            | 1883            | 2025            | 2126            | 2660            | 3641            |

Table 5 Height (cm)

| Sex | Age | N   | $\bar{X}$ | SD  | P <sub>3</sub> | P <sub>10</sub> | P <sub>25</sub> | P <sub>35</sub> | P <sub>50</sub> | P <sub>65</sub> | P <sub>75</sub> | P <sub>90</sub> | P <sub>97</sub> |
|-----|-----|-----|-----------|-----|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Men | 20~ | 184 | 171.6     | 5.1 | 162.2          | 164.6           | 168.0           | 169.6           | 171.3           | 173.2           | 174.8           | 178.9           | 181.4           |
|     | 25~ | 250 | 169.9     | 5.8 | 158.9          | 162.4           | 166.0           | 167.8           | 169.8           | 171.9           | 174.0           | 178.0           | 181.1           |
|     | 30~ | 270 | 168.9     | 5.9 | 156.4          | 161.6           | 165.2           | 166.7           | 169.1           | 171.1           | 172.8           | 176.8           | 179.8           |
|     | 35~ | 342 | 168.1     | 6.2 | 156.7          | 160.7           | 163.4           | 165.5           | 168.2           | 170.7           | 172.4           | 175.4           | 180.3           |
|     | 40~ | 395 | 167.4     | 5.8 | 156.2          | 160.4           | 163.8           | 164.8           | 167.6           | 169.4           | 171.1           | 174.9           | 177.7           |
|     | 45~ | 297 | 167.2     | 5.8 | 157.1          | 159.7           | 163.1           | 164.7           | 167.0           | 169.3           | 170.9           | 174.9           | 178.4           |
|     | 50~ | 155 | 166.9     | 6.0 | 155.7          | 159.1           | 162.8           | 164.8           | 167.0           | 169.7           | 170.9           | 174.5           | 176.1           |
|     | 55~ | 59  | 166.3     | 5.6 | 155.0          | 159.7           | 162.3           | 164.4           | 165.9           | 169.2           | 170.1           | 173.1           | 176.7           |

|       |     |     |       |     |       |       |       |       |       |       |       |       |       |
|-------|-----|-----|-------|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Women | 20~ | 190 | 158.3 | 5.4 | 147.9 | 151.3 | 154.6 | 155.8 | 158.2 | 160.3 | 162.3 | 165.6 | 168.7 |
|       | 25~ | 351 | 157.4 | 5.4 | 147.2 | 150.8 | 153.5 | 155.0 | 157.0 | 159.4 | 161.0 | 164.4 | 168.3 |
|       | 30~ | 297 | 156.4 | 5.4 | 146.0 | 149.5 | 153.4 | 154.5 | 156.4 | 158.3 | 160.0 | 163.2 | 167.8 |
|       | 35~ | 328 | 156.2 | 5.5 | 145.9 | 148.7 | 152.2 | 154.4 | 156.2 | 158.2 | 160.0 | 163.4 | 165.7 |
|       | 40~ | 313 | 154.9 | 5.4 | 144.7 | 148.7 | 151.3 | 152.5 | 154.7 | 156.8 | 158.7 | 161.9 | 165.0 |
|       | 45~ | 241 | 155.0 | 5.2 | 144.8 | 149.0 | 151.7 | 153.2 | 154.3 | 156.5 | 158.1 | 162.1 | 165.5 |
|       | 50~ | 199 | 154.8 | 5.6 | 144.4 | 148.5 | 151.5 | 153.1 | 154.6 | 156.5 | 157.9 | 161.6 | 167.0 |
|       | 55~ | 90  | 153.1 | 5.0 | 143.9 | 146.2 | 149.6 | 150.6 | 153.1 | 155.1 | 156.8 | 159.9 | 162.2 |

Table 6 Weight (kg)

| Sex   | Age | N   | $\bar{X}$ | SD   | P <sub>3</sub> | P <sub>10</sub> | P <sub>25</sub> | P <sub>35</sub> | P <sub>50</sub> | P <sub>65</sub> | P <sub>75</sub> | P <sub>90</sub> | P <sub>97</sub> |
|-------|-----|-----|-----------|------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Men   | 20~ | 184 | 63.7      | 10.0 | 49.7           | 54.0            | 57.7            | 59.6            | 62.1            | 64.8            | 67.2            | 75.9            | 86.6            |
|       | 25~ | 250 | 66.0      | 11.3 | 49.7           | 52.9            | 58.5            | 60.7            | 64.5            | 69.0            | 72.2            | 80.1            | 91.6            |
|       | 30~ | 270 | 66.9      | 10.6 | 49.4           | 54.7            | 59.6            | 62.6            | 66.1            | 69.1            | 72.1            | 80.0            | 95.2            |
|       | 35~ | 342 | 67.2      | 9.6  | 49.4           | 54.8            | 60.5            | 63.2            | 67.4            | 71.0            | 73.4            | 79.6            | 84.9            |
|       | 40~ | 395 | 66.8      | 9.6  | 49.5           | 54.8            | 60.4            | 63.2            | 66.3            | 69.9            | 72.9            | 78.4            | 86.4            |
|       | 45~ | 297 | 67.1      | 10.5 | 48.2           | 54.0            | 60.1            | 62.8            | 66.3            | 70.3            | 73.4            | 81.1            | 87.9            |
|       | 50~ | 155 | 66.0      | 8.7  | 49.2           | 55.0            | 61.1            | 63.6            | 66.5            | 68.6            | 70.7            | 76.3            | 85.6            |
|       | 55~ | 59  | 66.7      | 9.3  | 49.6           | 55.7            | 59.0            | 63.5            | 67.3            | 69.9            | 71.5            | 77.2            | 89.3            |
| Women | 20~ | 190 | 49.5      | 7.3  | 38.9           | 41.9            | 44.7            | 46.4            | 48.4            | 50.8            | 52.5            | 57.6            | 68.2            |
|       | 25~ | 351 | 49.7      | 6.8  | 39.7           | 41.9            | 45.2            | 46.9            | 48.7            | 51.2            | 53.4            | 57.9            | 63.1            |
|       | 30~ | 297 | 51.4      | 7.7  | 40.4           | 43.1            | 46.3            | 47.8            | 49.9            | 53.5            | 55.3            | 61.0            | 66.4            |
|       | 35~ | 328 | 53.4      | 7.9  | 41.5           | 44.1            | 47.8            | 49.7            | 52.7            | 55.4            | 58.0            | 64.8            | 69.5            |
|       | 40~ | 313 | 53.5      | 7.4  | 42.2           | 45.2            | 48.1            | 50.2            | 52.6            | 54.9            | 57.6            | 63.5            | 69.3            |
|       | 45~ | 241 | 55.6      | 7.8  | 42.5           | 46.7            | 50.1            | 52.0            | 54.5            | 57.6            | 60.3            | 66.7            | 72.3            |
|       | 50~ | 199 | 55.8      | 8.2  | 41.3           | 44.2            | 50.0            | 53.4            | 55.3            | 59.2            | 61.0            | 64.9            | 73.9            |
|       | 55~ | 90  | 56.1      | 8.0  | 41.5           | 46.1            | 50.8            | 53.0            | 55.6            | 57.7            | 61.8            | 68.5            | 72.2            |

Table 7 Chest girth (cm)

| Sex | Age | N   | $\bar{X}$ | SD  | P <sub>3</sub> | P <sub>10</sub> | P <sub>25</sub> | P <sub>35</sub> | P <sub>50</sub> | P <sub>65</sub> | P <sub>75</sub> | P <sub>90</sub> | P <sub>97</sub> |
|-----|-----|-----|-----------|-----|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Men | 20~ | 184 | 87.2      | 6.8 | 77.5           | 79.9            | 83.0            | 84.4            | 86.4            | 88.0            | 90.0            | 96.0            | 102.5           |
|     | 25~ | 250 | 89.6      | 7.8 | 78.3           | 80.3            | 84.5            | 86.0            | 88.0            | 91.7            | 93.6            | 99.5            | 107.5           |
|     | 30~ | 270 | 90.9      | 7.5 | 78.9           | 82.3            | 86.1            | 87.5            | 89.9            | 92.8            | 95.2            | 100.5           | 107.8           |
|     | 35~ | 342 | 91.5      | 6.7 | 78.1           | 83.1            | 87.2            | 89.0            | 91.1            | 93.9            | 95.3            | 100.1           | 105.0           |
|     | 40~ | 395 | 91.0      | 6.6 | 79.1           | 83.1            | 87.1            | 88.8            | 91.0            | 93.1            | 95.0            | 98.5            | 104.3           |
|     | 45~ | 297 | 91.4      | 6.6 | 79.9           | 82.5            | 87.2            | 88.7            | 91.0            | 93.9            | 96.0            | 99.8            | 104.6           |
|     | 50~ | 155 | 91.3      | 6.3 | 80.9           | 83.2            | 86.7            | 88.5            | 91.0            | 94.1            | 95.5            | 99.0            | 104.4           |
|     | 55~ | 59  | 92.9      | 7.0 | 81.1           | 85.8            | 88.0            | 90.0            | 92.8            | 95.1            | 96.0            | 100.8           | 115.1           |

|       |     |     |      |     |      |      |      |      |      |      |      |      |       |
|-------|-----|-----|------|-----|------|------|------|------|------|------|------|------|-------|
| Women | 20~ | 190 | 80.4 | 6.9 | 70.5 | 73.0 | 76.0 | 77.4 | 79.0 | 81.5 | 83.6 | 89.4 | 98.3  |
|       | 25~ | 351 | 80.9 | 6.4 | 71.5 | 74.3 | 76.5 | 77.8 | 80.1 | 82.2 | 84.0 | 89.2 | 96.2  |
|       | 30~ | 297 | 82.9 | 7.2 | 72.6 | 75.2 | 78.1 | 79.5 | 81.6 | 84.4 | 86.9 | 92.3 | 99.8  |
|       | 35~ | 328 | 84.8 | 7.4 | 73.0 | 75.5 | 79.3 | 81.3 | 84.0 | 87.0 | 89.5 | 95.5 | 100.6 |
|       | 40~ | 313 | 85.6 | 7.1 | 73.6 | 76.8 | 80.5 | 82.6 | 85.0 | 87.8 | 90.0 | 94.4 | 100.8 |
|       | 45~ | 241 | 87.4 | 7.1 | 74.8 | 78.3 | 82.2 | 84.4 | 87.2 | 90.0 | 92.2 | 97.1 | 100.8 |
|       | 50~ | 199 | 87.9 | 8.1 | 73.6 | 77.5 | 82.5 | 84.5 | 88.2 | 90.9 | 93.0 | 97.5 | 106.4 |
|       | 55~ | 90  | 88.5 | 7.5 | 73.0 | 78.4 | 84.3 | 85.9 | 87.5 | 91.0 | 93.1 | 99.3 | 104.4 |

Table 8 Waist girth (cm)

| Sex   | Age | N   | $\bar{X}$ | SD  | P <sub>3</sub> | P <sub>10</sub> | P <sub>25</sub> | P <sub>35</sub> | P <sub>50</sub> | P <sub>65</sub> | P <sub>75</sub> | P <sub>90</sub> | P <sub>97</sub> |
|-------|-----|-----|-----------|-----|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Men   | 20~ | 184 | 74.6      | 8.5 | 63.6           | 66.8            | 69.8            | 71.0            | 72.5            | 74.9            | 76.3            | 86.0            | 96.7            |
|       | 25~ | 250 | 78.9      | 9.5 | 64.9           | 67.6            | 72.0            | 74.0            | 78.0            | 81.9            | 85.2            | 90.2            | 100.3           |
|       | 30~ | 270 | 81.8      | 9.3 | 68.0           | 71.0            | 75.5            | 78.0            | 80.5            | 84.1            | 87.0            | 94.1            | 103.6           |
|       | 35~ | 342 | 83.1      | 8.6 | 66.3           | 71.3            | 77.4            | 80.0            | 83.4            | 86.0            | 88.4            | 93.9            | 100.0           |
|       | 40~ | 395 | 84.2      | 8.3 | 69.4           | 74.0            | 78.0            | 81.3            | 84.5            | 87.5            | 89.5            | 94.0            | 99.8            |
|       | 45~ | 297 | 84.5      | 8.9 | 67.8           | 73.0            | 78.1            | 81.1            | 84.5            | 88.0            | 89.9            | 95.6            | 101.7           |
|       | 50~ | 155 | 85.2      | 8.2 | 68.5           | 74.1            | 80.4            | 82.5            | 85.5            | 89.0            | 90.0            | 95.0            | 101.0           |
|       | 55~ | 59  | 86.8      | 8.6 | 73.2           | 75.0            | 80.2            | 84.0            | 86.8            | 89.4            | 92.0            | 97.5            | 107.5           |
| Women | 20~ | 190 | 69.3      | 6.6 | 59.6           | 62.4            | 65.0            | 66.4            | 68.1            | 70.3            | 72.3            | 77.2            | 86.3            |
|       | 25~ | 351 | 70.8      | 7.0 | 60.0           | 63.0            | 66.2            | 68.0            | 69.9            | 71.8            | 74.0            | 78.6            | 88.7            |
|       | 30~ | 297 | 74.1      | 7.7 | 63.5           | 65.7            | 69.0            | 70.9            | 73.2            | 75.5            | 78.0            | 84.5            | 89.9            |
|       | 35~ | 328 | 76.9      | 8.8 | 62.9           | 67.0            | 70.0            | 72.5            | 75.7            | 79.0            | 82.3            | 89.7            | 95.9            |
|       | 40~ | 313 | 78.5      | 8.3 | 64.0           | 67.9            | 72.7            | 74.6            | 78.0            | 81.8            | 84.4            | 89.6            | 93.6            |
|       | 45~ | 241 | 81.5      | 9.0 | 65.3           | 69.8            | 75.2            | 77.7            | 81.0            | 84.8            | 87.8            | 93.6            | 99.2            |
|       | 50~ | 199 | 83.9      | 9.6 | 66.5           | 71.0            | 77.0            | 81.0            | 83.6            | 87.0            | 90.0            | 98.0            | 102.9           |
|       | 55~ | 90  | 86.6      | 8.9 | 71.0           | 73.6            | 79.7            | 84.6            | 88.2            | 90.4            | 92.7            | 96.6            | 102.3           |

Table 9 Hip Girth (cm)

| Sex | Age | N   | $\bar{X}$ | SD  | P <sub>3</sub> | P <sub>10</sub> | P <sub>25</sub> | P <sub>35</sub> | P <sub>50</sub> | P <sub>65</sub> | P <sub>75</sub> | P <sub>90</sub> | P <sub>97</sub> |
|-----|-----|-----|-----------|-----|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Men | 20~ | 184 | 92.4      | 6.1 | 82.6           | 86.5            | 88.5            | 89.7            | 91.4            | 93.5            | 95.2            | 100.3           | 106.9           |
|     | 25~ | 250 | 93.9      | 6.8 | 82.7           | 85.0            | 89.2            | 91.0            | 93.0            | 96.1            | 98.0            | 102.2           | 107.0           |
|     | 30~ | 270 | 94.6      | 6.1 | 83.7           | 87.5            | 90.5            | 92.0            | 94.0            | 96.2            | 98.0            | 101.8           | 107.8           |
|     | 35~ | 342 | 94.2      | 5.8 | 82.8           | 86.5            | 90.0            | 91.8            | 94.5            | 96.5            | 98.0            | 102.0           | 104.4           |
|     | 40~ | 395 | 94.2      | 5.7 | 83.5           | 87.4            | 90.3            | 92.0            | 94.1            | 96.0            | 97.8            | 101.2           | 104.2           |
|     | 45~ | 297 | 94.5      | 5.9 | 83.5           | 86.3            | 90.5            | 92.5            | 94.6            | 97.0            | 98.2            | 101.5           | 106.4           |
|     | 50~ | 155 | 94.7      | 5.3 | 84.3           | 88.3            | 91.1            | 92.3            | 94.5            | 96.9            | 98.8            | 101.1           | 104.3           |
|     | 55~ | 59  | 95.3      | 6.0 | 85.6           | 88.5            | 91.3            | 93.0            | 94.5            | 96.5            | 97.9            | 103.0           | 113.9           |

|       |     |     |      |     |      |      |      |      |      |      |      |       |       |
|-------|-----|-----|------|-----|------|------|------|------|------|------|------|-------|-------|
| Women | 20~ | 190 | 89.5 | 5.3 | 79.9 | 83.4 | 86.0 | 87.5 | 89.2 | 90.6 | 92.5 | 96.0  | 102.9 |
|       | 25~ | 351 | 89.6 | 5.0 | 81.2 | 84.0 | 86.0 | 87.4 | 89.3 | 91.0 | 92.5 | 96.0  | 100.9 |
|       | 30~ | 297 | 91.0 | 5.7 | 81.6 | 84.5 | 87.5 | 89.0 | 90.5 | 92.2 | 94.0 | 97.8  | 102.4 |
|       | 35~ | 328 | 92.4 | 5.5 | 83.2 | 85.6 | 89.0 | 90.0 | 91.5 | 94.0 | 96.2 | 100.0 | 105.0 |
|       | 40~ | 313 | 92.4 | 5.4 | 84.5 | 86.3 | 88.5 | 89.6 | 91.8 | 94.0 | 95.6 | 99.0  | 104.2 |
|       | 45~ | 241 | 93.5 | 5.9 | 82.9 | 86.4 | 89.5 | 91.0 | 93.1 | 95.5 | 97.5 | 100.8 | 108.1 |
|       | 50~ | 199 | 93.3 | 5.7 | 82.9 | 85.5 | 89.6 | 91.1 | 93.5 | 95.5 | 97.0 | 101.0 | 104.8 |
|       | 55~ | 90  | 94.7 | 6.3 | 82.9 | 88.1 | 90.0 | 91.5 | 93.7 | 96.5 | 98.5 | 103.1 | 109.3 |

Table 10 Triceps skinfold (mm)

| Sex   | Age | N   | $\bar{X}$ | SD  | P <sub>3</sub> | P <sub>10</sub> | P <sub>25</sub> | P <sub>35</sub> | P <sub>50</sub> | P <sub>65</sub> | P <sub>75</sub> | P <sub>90</sub> | P <sub>97</sub> |
|-------|-----|-----|-----------|-----|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Men   | 20~ | 184 | 11.6      | 5.9 | 4.3            | 5.5             | 7.1             | 8.5             | 10.0            | 12.5            | 14.5            | 19.3            | 26.5            |
|       | 25~ | 250 | 13.3      | 6.3 | 4.5            | 6.0             | 8.5             | 10.0            | 12.5            | 15.0            | 17.0            | 21.0            | 25.0            |
|       | 30~ | 270 | 15.2      | 6.5 | 5.5            | 7.5             | 10.5            | 12.0            | 14.0            | 16.6            | 19.0            | 25.0            | 29.0            |
|       | 35~ | 342 | 14.1      | 5.8 | 5.0            | 7.0             | 10.0            | 11.0            | 14.0            | 16.0            | 17.1            | 21.9            | 25.9            |
|       | 40~ | 395 | 14.7      | 6.9 | 5.0            | 7.5             | 10.0            | 11.3            | 13.5            | 15.7            | 18.0            | 24.2            | 31.1            |
|       | 45~ | 297 | 13.8      | 5.9 | 5.0            | 7.0             | 9.5             | 11.0            | 13.0            | 15.0            | 17.0            | 22.0            | 28.5            |
|       | 50~ | 155 | 14.0      | 7.8 | 5.5            | 7.0             | 9.5             | 10.8            | 12.0            | 14.0            | 15.5            | 22.0            | 33.6            |
|       | 55~ | 59  | 13.1      | 6.2 | 4.9            | 7.0             | 9.5             | 10.0            | 12.0            | 14.0            | 16.5            | 21.0            | 32.0            |
| Women | 20~ | 190 | 22.6      | 6.6 | 11.7           | 15.1            | 18.0            | 20.0            | 22.0            | 25.0            | 26.5            | 30.0            | 35.0            |
|       | 25~ | 351 | 22.8      | 5.9 | 12.0           | 15.0            | 18.5            | 20.6            | 23.0            | 25.0            | 26.5            | 31.0            | 34.0            |
|       | 30~ | 297 | 24.9      | 6.6 | 14.0           | 17.0            | 20.3            | 22.0            | 24.5            | 27.0            | 29.0            | 33.0            | 39.1            |
|       | 35~ | 328 | 26.7      | 6.5 | 15.0           | 18.5            | 22.0            | 24.0            | 26.0            | 28.5            | 30.5            | 36.0            | 40.0            |
|       | 40~ | 313 | 27.4      | 6.7 | 14.5           | 19.7            | 23.5            | 25.0            | 27.0            | 29.6            | 31.0            | 35.2            | 41.6            |
|       | 45~ | 241 | 27.7      | 6.2 | 15.0           | 20.0            | 24.0            | 26.0            | 28.0            | 30.0            | 32.0            | 35.0            | 39.0            |
|       | 50~ | 199 | 28.3      | 7.2 | 13.5           | 20.0            | 23.0            | 25.5            | 28.5            | 31.0            | 33.0            | 37.0            | 42.0            |
|       | 55~ | 90  | 27.7      | 6.7 | 15.5           | 20.0            | 23.0            | 24.4            | 26.5            | 31.0            | 32.5            | 36.0            | 42.0            |

Table 11 Subscapular skinfold (mm)

| Sex | Age | N   | $\bar{X}$ | SD   | P <sub>3</sub> | P <sub>10</sub> | P <sub>25</sub> | P <sub>35</sub> | P <sub>50</sub> | P <sub>65</sub> | P <sub>75</sub> | P <sub>90</sub> | P <sub>97</sub> |
|-----|-----|-----|-----------|------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Men | 20~ | 184 | 16.5      | 8.1  | 7.8            | 9.5             | 11.0            | 12.5            | 14.0            | 16.0            | 19.5            | 25.3            | 38.7            |
|     | 25~ | 250 | 21.4      | 9.9  | 8.5            | 11.0            | 14.0            | 15.5            | 19.3            | 24.0            | 28.0            | 34.5            | 45.5            |
|     | 30~ | 270 | 24.1      | 9.2  | 9.6            | 12.6            | 17.5            | 20.0            | 24.0            | 27.0            | 29.0            | 35.5            | 46.6            |
|     | 35~ | 342 | 24.4      | 9.4  | 10.0           | 13.0            | 17.0            | 20.0            | 23.3            | 27.0            | 30.6            | 36.4            | 45.0            |
|     | 40~ | 395 | 25.8      | 10.3 | 9.5            | 13.0            | 19.0            | 21.0            | 25.0            | 29.0            | 32.0            | 38.2            | 45.2            |
|     | 45~ | 297 | 25.6      | 10.3 | 9.0            | 13.0            | 18.0            | 21.0            | 24.5            | 28.0            | 32.0            | 39.1            | 49.1            |
|     | 50~ | 155 | 23.7      | 9.3  | 9.5            | 12.0            | 16.5            | 19.8            | 23.0            | 27.0            | 30.0            | 35.0            | 47.0            |
|     | 55~ | 59  | 22.2      | 8.2  | 6.8            | 14.0            | 17.0            | 19.0            | 21.0            | 23.5            | 25.0            | 34.0            | 45.0            |

|       |     |     |      |     |      |      |      |      |      |      |      |      |      |
|-------|-----|-----|------|-----|------|------|------|------|------|------|------|------|------|
| Women | 20~ | 190 | 18.9 | 6.2 | 10.4 | 13.0 | 15.0 | 16.0 | 17.0 | 20.0 | 21.5 | 26.9 | 36.3 |
|       | 25~ | 351 | 18.9 | 5.6 | 10.0 | 12.5 | 15.0 | 16.0 | 18.0 | 20.5 | 22.5 | 26.8 | 31.4 |
|       | 30~ | 297 | 21.8 | 6.9 | 10.5 | 13.9 | 17.0 | 19.0 | 22.0 | 24.0 | 26.0 | 30.0 | 35.1 |
|       | 35~ | 328 | 23.8 | 7.4 | 11.9 | 14.0 | 18.1 | 20.5 | 23.0 | 26.0 | 29.0 | 34.1 | 38.1 |
|       | 40~ | 313 | 25.2 | 7.2 | 13.0 | 16.0 | 19.5 | 22.0 | 25.0 | 27.5 | 29.0 | 34.0 | 42.0 |
|       | 45~ | 241 | 25.4 | 6.9 | 12.8 | 15.0 | 21.5 | 23.5 | 26.0 | 28.0 | 30.0 | 34.0 | 37.7 |
|       | 50~ | 199 | 26.8 | 7.8 | 11.5 | 18.0 | 22.0 | 24.0 | 26.0 | 29.0 | 32.0 | 36.0 | 44.0 |
|       | 55~ | 90  | 26.5 | 8.2 | 10.9 | 16.6 | 21.4 | 23.0 | 26.0 | 30.0 | 32.1 | 37.9 | 45.0 |

Table 12 Abdominal skinfold (mm)

| Sex   | Age | N   | $\bar{X}$ | SD   | P <sub>3</sub> | P <sub>10</sub> | P <sub>25</sub> | P <sub>35</sub> | P <sub>50</sub> | P <sub>65</sub> | P <sub>75</sub> | P <sub>90</sub> | P <sub>97</sub> |
|-------|-----|-----|-----------|------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Men   | 20~ | 184 | 17.5      | 11.1 | 5.0            | 7.0             | 10.0            | 11.5            | 14.0            | 18.0            | 23.0            | 34.0            | 45.5            |
|       | 25~ | 250 | 24.8      | 12.6 | 6.3            | 10.0            | 14.9            | 19.0            | 23.0            | 28.0            | 32.0            | 42.0            | 55.5            |
|       | 30~ | 270 | 28.8      | 12.0 | 10.1           | 14.0            | 20.0            | 23.0            | 27.8            | 32.0            | 36.0            | 44.0            | 56.9            |
|       | 35~ | 342 | 30.4      | 11.7 | 8.5            | 15.5            | 22.0            | 25.0            | 30.0            | 34.5            | 38.0            | 46.9            | 55.0            |
|       | 40~ | 395 | 32.2      | 11.2 | 11.0           | 18.3            | 24.0            | 28.0            | 32.0            | 36.2            | 40.0            | 46.2            | 55.1            |
|       | 45~ | 297 | 32.0      | 12.4 | 9.0            | 15.8            | 23.3            | 27.0            | 31.0            | 36.0            | 41.5            | 50.0            | 55.0            |
|       | 50~ | 155 | 30.1      | 11.2 | 9.0            | 14.8            | 23.0            | 26.0            | 30.0            | 34.2            | 37.0            | 43.2            | 56.3            |
|       | 55~ | 59  | 31.5      | 10.0 | 13.1           | 21.0            | 23.0            | 27.0            | 31.0            | 34.0            | 36.5            | 45.0            | 55.2            |
| Women | 20~ | 190 | 23.8      | 7.9  | 12.0           | 14.6            | 18.0            | 20.5            | 23.0            | 25.0            | 27.0            | 34.0            | 42.8            |
|       | 25~ | 351 | 25.4      | 7.7  | 10.0           | 16.0            | 20.0            | 22.0            | 25.0            | 28.0            | 30.0            | 35.0            | 42.2            |
|       | 30~ | 297 | 29.1      | 8.7  | 14.9           | 18.0            | 23.0            | 25.2            | 28.0            | 32.0            | 35.0            | 40.6            | 46.0            |
|       | 35~ | 328 | 31.9      | 9.0  | 15.7           | 20.5            | 26.0            | 28.0            | 32.0            | 35.0            | 38.0            | 44.0            | 50.0            |
|       | 40~ | 313 | 33.1      | 8.5  | 18.0           | 22.7            | 26.8            | 29.5            | 33.0            | 37.0            | 39.0            | 45.0            | 50.0            |
|       | 45~ | 241 | 35.4      | 8.2  | 18.3           | 24.6            | 30.3            | 33.0            | 35.0            | 39.0            | 41.0            | 45.4            | 50.0            |
|       | 50~ | 199 | 37.2      | 10.4 | 16.0           | 25.0            | 31.0            | 33.0            | 37.0            | 40.5            | 44.0            | 50.0            | 57.0            |
|       | 55~ | 90  | 37.1      | 9.7  | 17.1           | 26.0            | 30.0            | 32.9            | 37.0            | 40.0            | 44.3            | 49.9            | 55.8            |

Table 13 Grip strength (kg)

| Sex | Age | N   | $\bar{X}$ | SD  | P <sub>3</sub> | P <sub>10</sub> | P <sub>25</sub> | P <sub>35</sub> | P <sub>50</sub> | P <sub>65</sub> | P <sub>75</sub> | P <sub>90</sub> | P <sub>97</sub> |
|-----|-----|-----|-----------|-----|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Men | 20~ | 184 | 41.0      | 8.1 | 27.7           | 31.0            | 34.2            | 37.8            | 40.8            | 44.9            | 46.7            | 51.2            | 55.5            |
|     | 25~ | 250 | 44.1      | 8.2 | 28.7           | 32.9            | 38.0            | 41.2            | 45.0            | 47.8            | 49.5            | 54.3            | 59.3            |
|     | 30~ | 270 | 44.6      | 7.8 | 28.6           | 35.7            | 40.0            | 42.1            | 44.2            | 46.9            | 49.8            | 55.5            | 58.5            |
|     | 35~ | 342 | 45.3      | 7.8 | 30.0           | 35.9            | 40.7            | 42.7            | 45.5            | 48.1            | 50.1            | 54.6            | 61.4            |
|     | 40~ | 395 | 44.8      | 7.8 | 30.5           | 35.0            | 39.4            | 41.8            | 45.0            | 48.0            | 50.0            | 54.3            | 59.0            |
|     | 45~ | 297 | 43.5      | 7.4 | 27.4           | 34.5            | 38.9            | 40.6            | 44.1            | 46.6            | 48.5            | 52.3            | 56.8            |
|     | 50~ | 155 | 41.1      | 7.7 | 24.4           | 30.9            | 36.5            | 38.7            | 41.6            | 43.9            | 46.6            | 50.8            | 54.1            |
|     | 55~ | 59  | 38.8      | 7.3 | 21.4           | 27.8            | 34.9            | 36.3            | 39.0            | 41.6            | 43.5            | 46.7            | 55.1            |

|       |     |     |      |     |      |      |      |      |      |      |      |      |      |
|-------|-----|-----|------|-----|------|------|------|------|------|------|------|------|------|
| Women | 20~ | 190 | 24.4 | 4.8 | 16.3 | 18.8 | 20.9 | 22.7 | 24.0 | 25.6 | 27.1 | 30.4 | 34.5 |
|       | 25~ | 351 | 24.6 | 4.8 | 16.4 | 19.2 | 21.1 | 22.5 | 24.3 | 26.0 | 27.2 | 30.7 | 34.2 |
|       | 30~ | 297 | 25.0 | 4.7 | 17.2 | 19.9 | 21.9 | 22.8 | 24.4 | 26.2 | 27.7 | 31.3 | 34.2 |
|       | 35~ | 328 | 25.4 | 4.8 | 16.8 | 18.9 | 21.7 | 23.3 | 25.7 | 27.4 | 28.8 | 31.7 | 34.1 |
|       | 40~ | 313 | 25.0 | 4.8 | 16.4 | 19.0 | 21.8 | 23.0 | 24.6 | 26.8 | 28.6 | 31.2 | 34.8 |
|       | 45~ | 241 | 24.4 | 5.0 | 15.4 | 18.4 | 20.5 | 22.3 | 24.1 | 26.3 | 28.0 | 31.1 | 34.6 |
|       | 50~ | 199 | 23.4 | 5.3 | 14.7 | 16.1 | 19.9 | 21.6 | 23.6 | 24.8 | 26.6 | 30.1 | 33.0 |
|       | 55~ | 90  | 22.2 | 5.3 | 12.7 | 16.8 | 19.0 | 20.3 | 22.0 | 23.0 | 23.9 | 28.2 | 32.7 |

Table 14 Back Strength (kg)

| Sex   | Age | N   | $\bar{X}$ | SD   | P <sub>3</sub> | P <sub>10</sub> | P <sub>25</sub> | P <sub>35</sub> | P <sub>50</sub> | P <sub>65</sub> | P <sub>75</sub> | P <sub>90</sub> | P <sub>97</sub> |
|-------|-----|-----|-----------|------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Men   | 20~ | 184 | 133.6     | 25.3 | 74.6           | 104.5           | 118.3           | 125.0           | 133.5           | 143.0           | 150.0           | 166.5           | 183.7           |
|       | 25~ | 244 | 126.7     | 29.8 | 66.0           | 89.5            | 108.3           | 116.8           | 127.0           | 138.0           | 146.0           | 164.0           | 177.7           |
|       | 30~ | 263 | 124.9     | 26.8 | 60.6           | 90.8            | 111.0           | 118.0           | 127.0           | 135.0           | 143.0           | 157.0           | 176.2           |
|       | 35~ | 326 | 126.6     | 27.0 | 80.8           | 92.0            | 110.0           | 115.5           | 126.0           | 135.6           | 144.0           | 163.0           | 183.6           |
| Women | 20~ | 188 | 67.2      | 20.0 | 38.7           | 44.9            | 52.0            | 59.0            | 65.5            | 73.0            | 79.0            | 89.0            | 109.7           |
|       | 25~ | 347 | 64.6      | 17.3 | 32.9           | 44.0            | 52.0            | 58.0            | 63.0            | 71.0            | 76.0            | 85.2            | 95.6            |
|       | 30~ | 293 | 66.4      | 17.3 | 33.8           | 45.4            | 54.0            | 58.9            | 65.0            | 73.0            | 79.0            | 90.0            | 99.2            |
|       | 35~ | 307 | 67.0      | 16.9 | 37.2           | 47.0            | 55.0            | 60.0            | 66.0            | 73.0            | 78.0            | 88.0            | 102.0           |

Table 15 Sit-and-reach (cm)

| Sex   | Age | N   | $\bar{X}$ | SD  | P <sub>3</sub> | P <sub>10</sub> | P <sub>25</sub> | P <sub>35</sub> | P <sub>50</sub> | P <sub>65</sub> | P <sub>75</sub> | P <sub>90</sub> | P <sub>97</sub> |
|-------|-----|-----|-----------|-----|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Men   | 20~ | 184 | 7.0       | 9.1 | -9.9           | -5.3            | 0.3             | 3.1             | 8.4             | 11.4            | 14.5            | 18.7            | 21.7            |
|       | 25~ | 247 | 4.8       | 8.8 | -13.1          | -7.0            | -1.2            | 1.7             | 5.5             | 8.6             | 10.8            | 16.0            | 21.0            |
|       | 30~ | 267 | 4.6       | 8.5 | -13.8          | -6.5            | -0.8            | 2.4             | 5.1             | 8.2             | 10.3            | 16.0            | 19.0            |
|       | 35~ | 339 | 4.2       | 8.7 | -11.7          | -6.7            | -2.8            | 1.1             | 4.4             | 8.0             | 10.3            | 15.5            | 20.0            |
|       | 40~ | 389 | 4.3       | 8.2 | -10.9          | -6.6            | -1.6            | 1.2             | 5.1             | 8.0             | 10.1            | 13.7            | 19.0            |
|       | 45~ | 293 | 3.7       | 8.3 | -12.4          | -7.5            | -2.1            | 0.5             | 3.6             | 7.5             | 9.7             | 14.3            | 19.2            |
|       | 50~ | 153 | 2.2       | 8.7 | -16.0          | -10.4           | -3.8            | -0.5            | 3.3             | 5.8             | 7.5             | 13.3            | 17.8            |
|       | 55~ | 58  | 1.0       | 8.3 | -15.7          | -9.8            | -5.1            | -2.9            | 1.8             | 4.2             | 6.3             | 12.6            | 19.1            |
| Women | 20~ | 188 | 7.3       | 8.1 | -7.7           | -3.7            | 2.0             | 4.5             | 7.8             | 9.8             | 12.4            | 17.8            | 23.3            |
|       | 25~ | 347 | 6.3       | 9.4 | -11.6          | -7.2            | 0.3             | 3.3             | 6.3             | 10.5            | 12.5            | 18.9            | 22.5            |
|       | 30~ | 292 | 6.8       | 8.4 | -9.8           | -5.1            | 1.0             | 3.7             | 7.4             | 10.2            | 12.8            | 18.0            | 20.6            |
|       | 35~ | 324 | 6.5       | 7.5 | -9.9           | -4.0            | 2.3             | 4.0             | 7.1             | 10.0            | 11.3            | 15.4            | 21.3            |
|       | 40~ | 308 | 6.3       | 8.3 | -9.8           | -4.3            | 1.3             | 3.1             | 6.2             | 9.4             | 12.4            | 17.0            | 21.5            |
|       | 45~ | 239 | 6.6       | 8.0 | -10.5          | -4.7            | 2.4             | 4.1             | 6.7             | 9.9             | 12.0            | 16.5            | 19.5            |
|       | 50~ | 195 | 6.6       | 8.2 | -9.0           | -4.9            | 1.5             | 3.7             | 7.2             | 10.1            | 12.2            | 16.6            | 21.6            |
|       | 55~ | 90  | 7.3       | 7.9 | -11.5          | -4.1            | 1.9             | 5.1             | 7.5             | 11.1            | 12.7            | 16.9            | 21.2            |

Table 16 Vertical jump (cm)

| Sex   | Age | N   | $\bar{X}$ | SD  | P <sub>3</sub> | P <sub>10</sub> | P <sub>25</sub> | P <sub>35</sub> | P <sub>50</sub> | P <sub>65</sub> | P <sub>75</sub> | P <sub>90</sub> | P <sub>97</sub> |
|-------|-----|-----|-----------|-----|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Men   | 20~ | 183 | 41.3      | 7.9 | 24.1           | 32.0            | 36.0            | 38.7            | 40.9            | 44.1            | 46.2            | 50.8            | 56.0            |
|       | 25~ | 245 | 37.2      | 7.1 | 24.0           | 28.3            | 32.6            | 34.2            | 36.8            | 39.2            | 41.8            | 46.8            | 52.8            |
|       | 30~ | 263 | 34.1      | 7.3 | 20.4           | 25.9            | 29.3            | 31.2            | 33.6            | 36.2            | 39.0            | 43.5            | 49.3            |
|       | 35~ | 325 | 33.0      | 6.8 | 20.0           | 24.0            | 29.0            | 30.9            | 32.9            | 35.5            | 37.3            | 41.2            | 46.0            |
| Women | 20~ | 186 | 24.7      | 4.9 | 16.6           | 19.5            | 21.6            | 22.2            | 23.7            | 25.8            | 27.4            | 30.0            | 36.5            |
|       | 25~ | 346 | 24.0      | 5.2 | 15.7           | 18.2            | 20.6            | 22.0            | 23.5            | 25.1            | 26.8            | 30.6            | 33.3            |
|       | 30~ | 292 | 22.4      | 4.0 | 15.6           | 17.2            | 20.0            | 21.0            | 22.2            | 23.5            | 25.0            | 27.3            | 30.4            |
|       | 35~ | 304 | 21.1      | 4.9 | 13.6           | 16.0            | 18.0            | 19.4            | 20.7            | 22.0            | 23.2            | 26.4            | 30.9            |

Table 17 One foot stand with eyes closed (second)

| Sex   | Age | N   | $\bar{X}$ | SD   | P <sub>3</sub> | P <sub>10</sub> | P <sub>25</sub> | P <sub>35</sub> | P <sub>50</sub> | P <sub>65</sub> | P <sub>75</sub> | P <sub>90</sub> | P <sub>97</sub> |
|-------|-----|-----|-----------|------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Men   | 20~ | 183 | 61.3      | 71.5 | 6.5            | 11.0            | 20.0            | 27.0            | 36.0            | 52.8            | 74.0            | 142.4           | 256.8           |
|       | 25~ | 250 | 50.3      | 54.0 | 3.0            | 7.0             | 17.0            | 22.0            | 34.0            | 50.0            | 63.3            | 110.5           | 210.8           |
|       | 30~ | 270 | 45.5      | 55.6 | 3.0            | 6.0             | 13.0            | 18.0            | 28.5            | 40.2            | 58.0            | 107.8           | 164.0           |
|       | 35~ | 341 | 34.9      | 34.9 | 3.0            | 7.0             | 12.4            | 15.0            | 22.0            | 36.3            | 48.0            | 76.6            | 120.4           |
|       | 40~ | 392 | 40.8      | 57.0 | 3.0            | 5.0             | 12.0            | 16.0            | 23.5            | 33.5            | 46.0            | 90.0            | 193.1           |
|       | 45~ | 293 | 34.4      | 57.9 | 3.0            | 5.0             | 9.0             | 12.0            | 18.0            | 26.1            | 38.0            | 70.6            | 172.3           |
|       | 50~ | 155 | 23.2      | 22.4 | 3.0            | 5.0             | 9.0             | 11.0            | 17.0            | 21.0            | 27.0            | 53.8            | 91.6            |
|       | 55~ | 59  | 21.3      | 23.2 | 2.8            | 4.0             | 7.0             | 8.0             | 14.0            | 21.0            | 30.0            | 44.0            | 107.2           |
| Women | 20~ | 190 | 56.1      | 56.4 | 4.0            | 10.0            | 20.0            | 25.0            | 38.5            | 57.2            | 67.8            | 124.8           | 211.5           |
|       | 25~ | 351 | 61.7      | 71.8 | 5.0            | 10.2            | 19.0            | 26.0            | 39.0            | 57.0            | 79.0            | 125.8           | 273.8           |
|       | 30~ | 297 | 46.4      | 49.8 | 5.0            | 9.0             | 15.0            | 20.3            | 30.0            | 44.7            | 61.5            | 99.6            | 191.1           |
|       | 35~ | 328 | 39.2      | 40.1 | 4.0            | 7.0             | 14.0            | 18.0            | 24.0            | 37.9            | 50.8            | 88.0            | 153.0           |
|       | 40~ | 310 | 34.0      | 44.3 | 3.0            | 6.0             | 11.0            | 14.0            | 21.0            | 29.2            | 39.3            | 75.0            | 118.0           |
|       | 45~ | 241 | 30.6      | 36.5 | 3.3            | 6.0             | 11.0            | 14.0            | 20.0            | 28.3            | 36.5            | 64.0            | 121.7           |
|       | 50~ | 197 | 25.8      | 43.6 | 3.0            | 5.0             | 9.0             | 11.0            | 15.0            | 20.0            | 24.0            | 55.0            | 88.8            |
|       | 55~ | 90  | 16.5      | 16.3 | 2.0            | 3.0             | 5.8             | 8.0             | 13.0            | 17.0            | 19.0            | 36.9            | 73.2            |

Table 18 10M×4 shuttle run (second)

| Sex   | Age | n   | $\bar{X}$ | SD  | P <sub>3</sub> | P <sub>10</sub> | P <sub>25</sub> | P <sub>35</sub> | P <sub>50</sub> | P <sub>65</sub> | P <sub>75</sub> | P <sub>90</sub> | P <sub>97</sub> |
|-------|-----|-----|-----------|-----|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Men   | 20~ | 183 | 11.3      | 1.0 | 9.8            | 10.2            | 10.5            | 10.8            | 11.2            | 11.6            | 11.9            | 12.6            | 13.4            |
|       | 25~ | 245 | 11.6      | 1.0 | 10.2           | 10.4            | 10.9            | 11.1            | 11.4            | 11.8            | 12.1            | 12.9            | 14.2            |
|       | 30~ | 263 | 12.0      | 1.1 | 10.4           | 10.8            | 11.3            | 11.5            | 11.8            | 12.2            | 12.5            | 13.3            | 14.7            |
|       | 35~ | 325 | 12.2      | 1.1 | 10.6           | 11.0            | 11.4            | 11.7            | 12.0            | 12.4            | 12.8            | 13.6            | 15.0            |
| Women | 20~ | 187 | 13.8      | 1.3 | 11.6           | 12.3            | 12.9            | 13.2            | 13.6            | 14.1            | 14.5            | 15.5            | 16.8            |
|       | 25~ | 346 | 13.8      | 1.3 | 11.8           | 12.4            | 13.0            | 13.3            | 13.8            | 14.2            | 14.6            | 15.4            | 16.7            |
|       | 30~ | 293 | 14.3      | 1.4 | 12.0           | 12.7            | 13.4            | 13.7            | 14.1            | 14.6            | 15.0            | 16.0            | 17.5            |
|       | 35~ | 306 | 14.8      | 1.4 | 12.5           | 13.1            | 13.9            | 14.2            | 14.6            | 15.2            | 15.7            | 16.5            | 17.9            |

Table 19 Selective response time (second)

| Sex   | Age | N   | $\bar{X}$ | SD    | P <sub>3</sub> | P <sub>10</sub> | P <sub>25</sub> | P <sub>35</sub> | P <sub>50</sub> | P <sub>65</sub> | P <sub>75</sub> | P <sub>90</sub> | P <sub>97</sub> |
|-------|-----|-----|-----------|-------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Men   | 20~ | 184 | 0.39      | 0.045 | 0.32           | 0.34            | 0.37            | 0.38            | 0.38            | 0.40            | 0.41            | 0.44            | 0.48            |
|       | 25~ | 250 | 0.40      | 0.039 | 0.33           | 0.35            | 0.37            | 0.38            | 0.40            | 0.41            | 0.42            | 0.45            | 0.49            |
|       | 30~ | 270 | 0.40      | 0.044 | 0.33           | 0.35            | 0.37            | 0.38            | 0.39            | 0.41            | 0.42            | 0.45            | 0.48            |
|       | 35~ | 342 | 0.40      | 0.047 | 0.33           | 0.36            | 0.37            | 0.38            | 0.40            | 0.41            | 0.42            | 0.47            | 0.51            |
|       | 40~ | 392 | 0.41      | 0.046 | 0.34           | 0.36            | 0.38            | 0.39            | 0.40            | 0.42            | 0.43            | 0.46            | 0.52            |
|       | 45~ | 293 | 0.41      | 0.041 | 0.35           | 0.36            | 0.38            | 0.39            | 0.41            | 0.42            | 0.43            | 0.47            | 0.49            |
|       | 50~ | 155 | 0.43      | 0.064 | 0.36           | 0.37            | 0.39            | 0.40            | 0.42            | 0.44            | 0.46            | 0.49            | 0.57            |
|       | 55~ | 59  | 0.43      | 0.048 | 0.36           | 0.38            | 0.40            | 0.40            | 0.43            | 0.45            | 0.46            | 0.49            | 0.55            |
| Women | 20~ | 190 | 0.42      | 0.043 | 0.35           | 0.36            | 0.39            | 0.40            | 0.41            | 0.43            | 0.44            | 0.47            | 0.51            |
|       | 25~ | 351 | 0.42      | 0.040 | 0.35           | 0.36            | 0.39            | 0.40            | 0.41            | 0.43            | 0.44            | 0.47            | 0.49            |
|       | 30~ | 297 | 0.42      | 0.040 | 0.35           | 0.38            | 0.39            | 0.40            | 0.42            | 0.43            | 0.45            | 0.47            | 0.50            |
|       | 35~ | 328 | 0.43      | 0.050 | 0.35           | 0.38            | 0.40            | 0.41            | 0.42            | 0.44            | 0.45            | 0.49            | 0.55            |
|       | 40~ | 312 | 0.44      | 0.057 | 0.36           | 0.38            | 0.40            | 0.42            | 0.44            | 0.45            | 0.47            | 0.50            | 0.55            |
|       | 45~ | 241 | 0.45      | 0.060 | 0.37           | 0.38            | 0.41            | 0.43            | 0.44            | 0.46            | 0.48            | 0.52            | 0.59            |
|       | 50~ | 197 | 0.47      | 0.068 | 0.36           | 0.40            | 0.42            | 0.44            | 0.46            | 0.49            | 0.50            | 0.54            | 0.62            |
|       | 55~ | 90  | 0.47      | 0.071 | 0.38           | 0.40            | 0.43            | 0.44            | 0.45            | 0.48            | 0.50            | 0.56            | 0.65            |

Table 20 Pull-ups (Men) /Sit-ups (Women) (times)

| Sex   | Age | N   | $\bar{X}$ | SD   | P <sub>3</sub> | P <sub>10</sub> | P <sub>25</sub> | P <sub>35</sub> | P <sub>50</sub> | P <sub>65</sub> | P <sub>75</sub> | P <sub>90</sub> | P <sub>97</sub> |
|-------|-----|-----|-----------|------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Men   | 20~ | 183 | 183       | 34.4 | 15.2           | 10.0            | 18.0            | 24.0            | 28.0            | 30.0            | 39.0            | 43.0            | 55.0            |
|       | 25~ | 245 | 243       | 27.4 | 13.7           | 8.6             | 10.0            | 19.0            | 20.0            | 25.0            | 30.0            | 35.0            | 49.6            |
|       | 30~ | 263 | 259       | 23.1 | 12.1           | 7.8             | 10.0            | 15.0            | 18.0            | 20.0            | 24.0            | 28.0            | 40.0            |
|       | 35~ | 325 | 319       | 21.8 | 11.1           | 6.0             | 10.0            | 14.0            | 17.0            | 20.0            | 24.0            | 28.0            | 35.0            |
| Women | 20~ | 187 | 183       | 26.3 | 9.9            | 12.0            | 16.4            | 20.0            | 22.0            | 25.0            | 27.6            | 30.0            | 37.6            |
|       | 25~ | 346 | 338       | 23.5 | 8.9            | 8.3             | 12.0            | 18.0            | 20.0            | 24.0            | 26.0            | 29.0            | 34.0            |
|       | 30~ | 293 | 274       | 20.8 | 9.1            | 3.3             | 10.0            | 15.0            | 18.0            | 20.5            | 24.0            | 26.0            | 30.0            |
|       | 35~ | 306 | 260       | 17.6 | 9.1            | 3.0             | 6.1             | 12.0            | 14.0            | 17.0            | 20.0            | 22.0            | 27.0            |

Table 21 Quitelet index

| Sex | Age | N   | $\bar{X}$ | SD   | P <sub>3</sub> | P <sub>10</sub> | P <sub>25</sub> | P <sub>35</sub> | P <sub>50</sub> | P <sub>65</sub> | P <sub>75</sub> | P <sub>90</sub> | P <sub>97</sub> |
|-----|-----|-----|-----------|------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Men | 20~ | 184 | 371.0     | 54.4 | 288.7          | 324.3           | 340.9           | 349.1           | 360.3           | 374.9           | 388.3           | 437.9           | 500.0           |
|     | 25~ | 250 | 387.7     | 61.6 | 298.7          | 320.3           | 345.1           | 361.3           | 376.4           | 400.4           | 420.8           | 464.1           | 528.5           |
|     | 30~ | 270 | 395.5     | 59.0 | 305.5          | 330.9           | 356.1           | 369.6           | 387.7           | 410.1           | 423.4           | 468.9           | 544.1           |
|     | 35~ | 342 | 399.1     | 51.1 | 299.5          | 334.7           | 364.7           | 379.3           | 399.6           | 417.1           | 430.4           | 466.7           | 494.8           |
|     | 40~ | 395 | 398.8     | 53.4 | 301.3          | 334.4           | 363.2           | 379.2           | 395.9           | 416.5           | 428.8           | 462.6           | 501.6           |
|     | 45~ | 297 | 400.8     | 55.9 | 297.1          | 329.2           | 363.0           | 377.8           | 398.8           | 418.3           | 433.5           | 470.0           | 523.2           |
|     | 50~ | 155 | 395.1     | 46.9 | 305.4          | 335.5           | 366.0           | 379.6           | 395.9           | 414.7           | 421.7           | 454.2           | 497.0           |
|     | 55~ | 59  | 401.2     | 54.9 | 301.0          | 342.7           | 361.6           | 374.4           | 398.8           | 413.3           | 431.3           | 475.7           | 562.9           |



|       |     |     |       |      |       |       |       |       |       |       |       |       |       |
|-------|-----|-----|-------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Women | 20~ | 190 | 312.5 | 42.7 | 251.9 | 266.6 | 283.7 | 295.5 | 305.9 | 314.7 | 327.1 | 363.9 | 424.5 |
|       | 25~ | 351 | 315.2 | 38.9 | 256.4 | 274.5 | 291.7 | 298.9 | 309.6 | 323.8 | 332.5 | 361.6 | 399.7 |
|       | 30~ | 297 | 328.1 | 45.6 | 266.5 | 280.0 | 299.0 | 306.5 | 320.0 | 338.6 | 348.5 | 380.1 | 425.1 |
|       | 35~ | 328 | 341.9 | 46.3 | 273.0 | 285.9 | 309.0 | 318.7 | 336.1 | 354.0 | 366.6 | 413.4 | 443.3 |
|       | 40~ | 313 | 345.3 | 45.2 | 281.0 | 293.3 | 312.0 | 324.4 | 340.3 | 353.4 | 369.9 | 406.6 | 445.3 |
|       | 45~ | 241 | 358.5 | 47.0 | 282.4 | 306.2 | 326.8 | 336.1 | 356.5 | 371.2 | 383.6 | 427.7 | 464.9 |
|       | 50~ | 199 | 359.9 | 48.8 | 268.2 | 297.6 | 326.5 | 341.5 | 359.3 | 379.2 | 390.9 | 414.8 | 477.4 |
|       | 55~ | 90  | 366.3 | 48.5 | 281.1 | 309.6 | 331.8 | 346.8 | 360.1 | 377.6 | 401.1 | 430.8 | 467.9 |

Table 22 Chest girth/Height×100

| Sex   | Age | N   | $\bar{X}$ | SD  | P <sub>3</sub> | P <sub>10</sub> | P <sub>25</sub> | P <sub>35</sub> | P <sub>50</sub> | P <sub>65</sub> | P <sub>75</sub> | P <sub>90</sub> | P <sub>97</sub> |
|-------|-----|-----|-----------|-----|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Men   | 20~ | 184 | 50.8      | 4.1 | 45.1           | 46.6            | 48.5            | 49.2            | 50.2            | 51.2            | 52.5            | 56.0            | 60.5            |
|       | 25~ | 250 | 52.7      | 4.4 | 45.7           | 47.6            | 49.6            | 50.7            | 52.1            | 54.2            | 55.2            | 58.3            | 61.3            |
|       | 30~ | 270 | 53.9      | 4.4 | 47.2           | 49.1            | 50.6            | 51.7            | 53.3            | 55.1            | 56.6            | 59.8            | 63.9            |
|       | 35~ | 342 | 54.5      | 3.9 | 47.7           | 49.7            | 51.8            | 52.8            | 54.3            | 55.7            | 56.8            | 59.4            | 62.7            |
|       | 40~ | 395 | 54.4      | 4.0 | 47.2           | 49.4            | 51.8            | 53.2            | 54.4            | 55.7            | 56.7            | 59.1            | 62.0            |
|       | 45~ | 297 | 54.7      | 3.7 | 47.3           | 49.8            | 52.1            | 53.3            | 54.9            | 56.2            | 57.2            | 59.4            | 61.5            |
|       | 50~ | 155 | 54.7      | 3.8 | 47.6           | 50.0            | 51.9            | 52.6            | 54.8            | 56.6            | 57.8            | 59.8            | 61.7            |
|       | 55~ | 59  | 55.9      | 4.8 | 47.1           | 51.5            | 53.1            | 54.3            | 55.4            | 56.8            | 58.0            | 60.5            | 70.2            |
| Women | 20~ | 190 | 50.9      | 4.4 | 44.4           | 46.0            | 47.9            | 48.8            | 49.9            | 51.1            | 52.9            | 56.7            | 62.1            |
|       | 25~ | 351 | 51.4      | 4.2 | 45.7           | 47.0            | 48.6            | 49.6            | 50.8            | 52.0            | 53.3            | 56.4            | 61.4            |
|       | 30~ | 297 | 53.0      | 4.7 | 46.1           | 47.9            | 49.8            | 50.8            | 52.3            | 53.9            | 55.2            | 58.7            | 64.6            |
|       | 35~ | 328 | 54.3      | 5.0 | 45.7           | 48.7            | 50.8            | 52.0            | 53.9            | 55.8            | 57.2            | 60.9            | 64.6            |
|       | 40~ | 313 | 55.3      | 4.9 | 47.5           | 49.4            | 51.5            | 52.9            | 55.2            | 57.0            | 58.6            | 61.6            | 64.6            |
|       | 45~ | 241 | 56.4      | 4.8 | 48.3           | 50.2            | 52.8            | 54.6            | 56.5            | 57.9            | 59.6            | 63.1            | 66.0            |
|       | 50~ | 199 | 56.8      | 5.2 | 47.6           | 50.1            | 53.2            | 54.9            | 57.1            | 58.7            | 59.9            | 63.3            | 67.1            |
|       | 55~ | 90  | 57.8      | 4.9 | 49.7           | 52.0            | 54.4            | 56.6            | 57.7            | 59.0            | 59.9            | 64.0            | 70.3            |

Table 23 Waist girth/Height×100

| Sex | Age | N   | $\bar{X}$ | SD  | P <sub>3</sub> | P <sub>10</sub> | P <sub>25</sub> | P <sub>35</sub> | P <sub>50</sub> | P <sub>65</sub> | P <sub>75</sub> | P <sub>90</sub> | P <sub>97</sub> |
|-----|-----|-----|-----------|-----|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Men | 20~ | 184 | 43.5      | 5.0 | 37.5           | 39.6            | 40.4            | 41.0            | 42.3            | 43.4            | 44.9            | 49.7            | 58.4            |
|     | 25~ | 250 | 46.4      | 5.4 | 38.2           | 40.0            | 42.4            | 43.5            | 45.8            | 48.3            | 49.7            | 53.4            | 57.5            |
|     | 30~ | 270 | 48.5      | 5.5 | 40.2           | 41.8            | 44.5            | 45.9            | 47.8            | 50.1            | 51.7            | 55.5            | 61.1            |
|     | 35~ | 342 | 49.4      | 5.0 | 40.2           | 42.9            | 46.3            | 47.3            | 49.3            | 50.9            | 52.6            | 55.8            | 60.3            |
|     | 40~ | 395 | 50.3      | 5.0 | 41.0           | 44.5            | 47.0            | 48.3            | 50.5            | 52.1            | 53.4            | 56.1            | 59.3            |
|     | 45~ | 297 | 50.5      | 5.0 | 41.3           | 43.8            | 47.0            | 48.5            | 50.8            | 52.5            | 54.1            | 56.8            | 59.5            |
|     | 50~ | 155 | 51.1      | 5.1 | 41.4           | 43.9            | 47.5            | 49.4            | 51.5            | 53.5            | 54.5            | 57.7            | 59.7            |
|     | 55~ | 59  | 52.3      | 5.5 | 42.3           | 46.2            | 48.9            | 49.9            | 51.3            | 54.3            | 56.2            | 58.3            | 68.6            |

|       |     |     |      |     |      |      |      |      |      |      |      |      |      |
|-------|-----|-----|------|-----|------|------|------|------|------|------|------|------|------|
| Women | 20~ | 190 | 43.8 | 4.3 | 38.0 | 39.5 | 40.9 | 41.7 | 42.7 | 44.6 | 45.4 | 49.5 | 55.3 |
|       | 25~ | 351 | 45.0 | 4.5 | 38.5 | 40.3 | 42.0 | 42.9 | 44.2 | 45.7 | 47.1 | 50.5 | 56.3 |
|       | 30~ | 297 | 47.4 | 5.1 | 40.0 | 41.9 | 44.0 | 45.2 | 46.7 | 48.3 | 49.7 | 53.9 | 58.8 |
|       | 35~ | 328 | 49.3 | 5.7 | 40.7 | 42.6 | 44.9 | 46.3 | 48.3 | 51.0 | 53.2 | 57.1 | 61.2 |
|       | 40~ | 313 | 50.7 | 5.6 | 41.3 | 43.5 | 46.6 | 48.1 | 50.3 | 53.0 | 54.7 | 58.5 | 61.5 |
|       | 45~ | 241 | 52.6 | 6.0 | 41.6 | 45.0 | 48.2 | 49.9 | 52.1 | 54.5 | 56.9 | 61.3 | 64.4 |
|       | 50~ | 199 | 54.2 | 6.2 | 43.1 | 45.8 | 50.2 | 51.8 | 53.9 | 56.6 | 58.3 | 62.6 | 66.5 |
|       | 55~ | 90  | 56.6 | 6.1 | 45.5 | 48.6 | 52.1 | 55.1 | 57.1 | 59.1 | 61.0 | 63.5 | 67.6 |

Table 24 Hip girth/Height×100

| Sex   | Age | N   | $\bar{X}$ | SD  | P <sub>3</sub> | P <sub>10</sub> | P <sub>25</sub> | P <sub>35</sub> | P <sub>50</sub> | P <sub>65</sub> | P <sub>75</sub> | P <sub>90</sub> | P <sub>97</sub> |
|-------|-----|-----|-----------|-----|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Men   | 20~ | 184 | 53.9      | 3.4 | 48.8           | 50.2            | 51.7            | 52.4            | 53.2            | 54.5            | 55.4            | 57.4            | 63.0            |
|       | 25~ | 250 | 55.2      | 3.7 | 48.4           | 51.1            | 52.6            | 53.7            | 55.1            | 56.3            | 57.4            | 60.0            | 62.3            |
|       | 30~ | 270 | 56.0      | 3.5 | 50.3           | 51.8            | 53.7            | 54.6            | 55.5            | 57.3            | 58.4            | 60.4            | 64.3            |
|       | 35~ | 342 | 56.1      | 3.2 | 50.1           | 52.2            | 54.0            | 54.5            | 56.0            | 57.3            | 58.2            | 60.2            | 62.4            |
|       | 40~ | 395 | 56.3      | 3.4 | 50.6           | 52.2            | 54.2            | 55.0            | 56.2            | 57.5            | 58.3            | 60.3            | 62.6            |
|       | 45~ | 297 | 56.5      | 3.2 | 50.0           | 52.1            | 54.3            | 55.6            | 56.5            | 57.8            | 58.8            | 60.8            | 62.4            |
|       | 50~ | 155 | 56.8      | 3.3 | 50.5           | 52.9            | 54.3            | 55.2            | 56.9            | 58.2            | 59.1            | 61.2            | 62.8            |
|       | 55~ | 59  | 57.3      | 4.3 | 50.8           | 53.2            | 54.9            | 56.0            | 56.7            | 57.5            | 58.7            | 60.6            | 69.5            |
| Women | 20~ | 190 | 56.6      | 3.3 | 51.3           | 52.6            | 54.6            | 55.0            | 55.9            | 57.3            | 58.4            | 61.4            | 64.4            |
|       | 25~ | 351 | 57.0      | 3.1 | 52.2           | 53.3            | 54.6            | 55.6            | 56.5            | 57.8            | 58.8            | 61.3            | 63.4            |
|       | 30~ | 297 | 58.2      | 3.6 | 52.5           | 54.4            | 55.9            | 56.7            | 57.9            | 59.1            | 59.9            | 62.5            | 66.0            |
|       | 35~ | 328 | 59.2      | 3.3 | 53.5           | 55.5            | 57.0            | 57.7            | 58.6            | 60.0            | 61.3            | 63.6            | 66.7            |
|       | 40~ | 313 | 59.7      | 3.7 | 53.7           | 55.5            | 57.1            | 58.1            | 59.4            | 60.8            | 61.7            | 64.1            | 67.4            |
|       | 45~ | 241 | 60.4      | 3.8 | 53.9           | 55.9            | 57.4            | 58.5            | 60.1            | 61.6            | 62.9            | 65.2            | 69.8            |
|       | 50~ | 199 | 60.3      | 3.6 | 54.0           | 55.7            | 58.0            | 59.0            | 60.1            | 61.4            | 62.3            | 65.5            | 67.2            |
|       | 55~ | 90  | 61.9      | 4.1 | 0.78           | 0.82            | 0.85            | 0.89            | 0.92            | 0.95            | 0.97            | 1.00            | 1.06            |

Table 25 Waist-to-hip girth ratio

| Sex | Age | N   | $\bar{X}$ | SD   | P <sub>3</sub> | P <sub>10</sub> | P <sub>25</sub> | P <sub>35</sub> | P <sub>50</sub> | P <sub>65</sub> | P <sub>75</sub> | P <sub>90</sub> | P <sub>97</sub> |
|-----|-----|-----|-----------|------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Men | 20~ | 184 | 0.81      | 0.05 | 0.73           | 0.75            | 0.77            | 0.78            | 0.80            | 0.81            | 0.83            | 0.88            | 0.94            |
|     | 25~ | 250 | 0.84      | 0.05 | 0.74           | 0.77            | 0.80            | 0.81            | 0.83            | 0.85            | 0.88            | 0.92            | 0.95            |
|     | 30~ | 270 | 0.86      | 0.06 | 0.77           | 0.78            | 0.82            | 0.84            | 0.86            | 0.89            | 0.90            | 0.94            | 0.99            |
|     | 35~ | 342 | 0.88      | 0.06 | 0.78           | 0.81            | 0.84            | 0.86            | 0.88            | 0.90            | 0.92            | 0.95            | 0.99            |
|     | 40~ | 395 | 0.89      | 0.06 | 0.79           | 0.82            | 0.85            | 0.87            | 0.89            | 0.92            | 0.93            | 0.96            | 1.00            |
|     | 45~ | 297 | 0.89      | 0.06 | 0.79           | 0.82            | 0.86            | 0.87            | 0.89            | 0.91            | 0.93            | 0.96            | 1.00            |
|     | 50~ | 155 | 0.90      | 0.06 | 0.78           | 0.83            | 0.86            | 0.88            | 0.90            | 0.92            | 0.93            | 0.97            | 1.01            |
|     | 55~ | 59  | 0.91      | 0.05 | 0.82           | 0.83            | 0.88            | 0.89            | 0.91            | 0.93            | 0.94            | 0.98            | 1.01            |

|       |     |     |      |      |      |      |      |      |      |      |      |      |      |
|-------|-----|-----|------|------|------|------|------|------|------|------|------|------|------|
| Women | 20~ | 190 | 0.77 | 0.05 | 0.70 | 0.72 | 0.74 | 0.75 | 0.77 | 0.79 | 0.80 | 0.83 | 0.90 |
|       | 25~ | 351 | 0.79 | 0.06 | 0.70 | 0.73 | 0.75 | 0.77 | 0.78 | 0.80 | 0.82 | 0.86 | 0.93 |
|       | 30~ | 297 | 0.81 | 0.06 | 0.72 | 0.75 | 0.77 | 0.79 | 0.81 | 0.83 | 0.84 | 0.90 | 0.94 |
|       | 35~ | 328 | 0.83 | 0.07 | 0.72 | 0.75 | 0.78 | 0.80 | 0.83 | 0.85 | 0.88 | 0.93 | 0.97 |
|       | 40~ | 313 | 0.85 | 0.06 | 0.73 | 0.77 | 0.80 | 0.82 | 0.84 | 0.87 | 0.90 | 0.94 | 0.97 |
|       | 45~ | 241 | 0.87 | 0.07 | 0.75 | 0.78 | 0.82 | 0.83 | 0.86 | 0.91 | 0.92 | 0.96 | 1.01 |
|       | 50~ | 199 | 0.90 | 0.07 | 0.76 | 0.80 | 0.85 | 0.87 | 0.90 | 0.92 | 0.96 | 1.00 | 1.03 |
|       | 55~ | 90  | 0.91 | 0.07 | 0.78 | 0.82 | 0.85 | 0.89 | 0.92 | 0.95 | 0.97 | 1.00 | 1.06 |

Table 26 BMI Index

| Sex   | Age | N   | $\bar{X}$ | SD  | P <sub>3</sub> | P <sub>10</sub> | P <sub>25</sub> | P <sub>35</sub> | P <sub>50</sub> | P <sub>65</sub> | P <sub>75</sub> | P <sub>90</sub> | P <sub>97</sub> |
|-------|-----|-----|-----------|-----|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Men   | 20~ | 184 | 21.6      | 3.1 | 16.8           | 19.2            | 20.1            | 20.5            | 20.9            | 21.7            | 22.3            | 25.3            | 29.4            |
|       | 25~ | 250 | 22.8      | 3.5 | 17.5           | 18.9            | 20.5            | 21.4            | 22.5            | 23.5            | 24.6            | 26.6            | 30.6            |
|       | 30~ | 270 | 23.4      | 3.4 | 18.6           | 19.7            | 21.0            | 21.9            | 22.9            | 24.2            | 25.1            | 27.6            | 31.9            |
|       | 35~ | 342 | 23.8      | 3.2 | 18.2           | 20.1            | 22.0            | 22.7            | 23.7            | 24.8            | 25.4            | 27.4            | 29.3            |
|       | 40~ | 395 | 23.8      | 3.1 | 18.5           | 19.9            | 21.9            | 22.7            | 23.7            | 24.9            | 25.7            | 27.7            | 30.1            |
|       | 45~ | 297 | 24.0      | 3.1 | 18.1           | 20.0            | 21.9            | 22.6            | 24.0            | 24.9            | 25.9            | 27.6            | 31.1            |
|       | 50~ | 155 | 23.7      | 2.7 | 18.5           | 20.1            | 21.8            | 22.6            | 24.0            | 24.9            | 25.5            | 27.1            | 28.9            |
|       | 55~ | 59  | 24.2      | 3.5 | 17.8           | 20.9            | 22.2            | 22.6            | 23.6            | 24.4            | 25.6            | 28.4            | 35.4            |
| Women | 20~ | 190 | 19.7      | 2.7 | 16.1           | 17.2            | 18.0            | 18.5            | 19.1            | 20.0            | 20.7            | 23.1            | 27.0            |
|       | 25~ | 351 | 20.0      | 2.4 | 16.5           | 17.6            | 18.4            | 18.9            | 19.7            | 20.5            | 21.2            | 22.9            | 25.5            |
|       | 30~ | 297 | 21.0      | 2.9 | 16.9           | 18.0            | 19.2            | 19.6            | 20.6            | 21.6            | 22.2            | 24.3            | 26.8            |
|       | 35~ | 328 | 21.9      | 2.9 | 17.8           | 18.5            | 19.7            | 20.4            | 21.5            | 22.6            | 23.3            | 26.8            | 27.9            |
|       | 40~ | 313 | 22.3      | 3.0 | 17.8           | 18.9            | 20.2            | 21.1            | 22.0            | 23.0            | 23.9            | 26.2            | 28.5            |
|       | 45~ | 241 | 23.1      | 3.0 | 18.2           | 19.7            | 20.9            | 21.7            | 22.8            | 24.0            | 24.8            | 27.6            | 30.0            |
|       | 50~ | 199 | 23.2      | 3.1 | 17.7           | 19.4            | 21.2            | 21.9            | 23.4            | 24.5            | 25.0            | 27.1            | 29.8            |
|       | 55~ | 90  | 23.9      | 3.1 | 18.7           | 20.5            | 21.7            | 22.7            | 23.5            | 24.6            | 25.8            | 28.8            | 30.7            |

Table 27 Index of Step Test

| Sex | Age | N   | $\bar{X}$ | SD   | P <sub>3</sub> | P <sub>10</sub> | P <sub>25</sub> | P <sub>35</sub> | P <sub>50</sub> | P <sub>65</sub> | P <sub>75</sub> | P <sub>90</sub> | P <sub>97</sub> |
|-----|-----|-----|-----------|------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Men | 20~ | 183 | 54.8      | 8.8  | 40.2           | 44.7            | 48.4            | 50.7            | 53.9            | 57.2            | 60.0            | 66.7            | 73.8            |
|     | 25~ | 250 | 52.4      | 8.5  | 40.4           | 43.5            | 46.2            | 47.6            | 50.7            | 54.2            | 57.3            | 64.2            | 73.1            |
|     | 30~ | 270 | 51.0      | 6.9  | 40.2           | 42.9            | 45.9            | 48.1            | 50.3            | 53.6            | 55.3            | 59.9            | 65.5            |
|     | 35~ | 342 | 53.1      | 8.3  | 39.3           | 44.0            | 47.6            | 49.2            | 52.0            | 54.5            | 57.8            | 64.3            | 70.9            |
|     | 40~ | 395 | 58.9      | 10.8 | 43.6           | 47.3            | 52.0            | 53.9            | 56.6            | 60.6            | 63.8            | 73.8            | 84.2            |
|     | 45~ | 295 | 58.3      | 11.2 | 42.4           | 47.3            | 50.8            | 53.4            | 57.0            | 60.8            | 63.4            | 70.5            | 83.4            |
|     | 50~ | 153 | 58.6      | 10.8 | 38.8           | 48.0            | 52.2            | 54.5            | 57.7            | 61.3            | 63.4            | 71.2            | 83.6            |
|     | 55~ | 58  | 59.3      | 13.0 | 39.0           | 47.2            | 51.1            | 53.7            | 56.1            | 60.7            | 65.1            | 74.9            | 100.2           |

|       |     |     |      |      |      |      |      |      |      |      |      |      |      |
|-------|-----|-----|------|------|------|------|------|------|------|------|------|------|------|
| Women | 20~ | 189 | 54.9 | 8.4  | 42.2 | 45.9 | 49.5 | 50.7 | 53.6 | 56.1 | 59.6 | 66.2 | 75.6 |
|       | 25~ | 349 | 55.3 | 8.8  | 42.7 | 45.7 | 49.5 | 51.4 | 53.9 | 56.6 | 59.2 | 66.7 | 76.3 |
|       | 30~ | 297 | 56.3 | 8.2  | 44.3 | 47.1 | 50.6 | 52.7 | 55.2 | 58.4 | 61.2 | 66.8 | 72.7 |
|       | 35~ | 328 | 58.3 | 9.4  | 44.3 | 47.6 | 52.3 | 54.2 | 57.1 | 60.3 | 63.7 | 70.9 | 77.1 |
|       | 40~ | 313 | 61.3 | 10.8 | 43.6 | 50.0 | 54.4 | 56.9 | 60.4 | 63.4 | 67.2 | 75.0 | 87.2 |
|       | 45~ | 239 | 63.4 | 11.6 | 43.1 | 50.3 | 56.3 | 58.5 | 62.1 | 67.2 | 70.3 | 78.3 | 89.6 |
|       | 50~ | 196 | 65.1 | 12.6 | 41.1 | 49.6 | 57.8 | 61.2 | 65.2 | 69.2 | 72.6 | 79.6 | 90.1 |
|       | 55~ | 88  | 64.7 | 13.5 | 34.2 | 48.8 | 57.8 | 60.3 | 62.9 | 68.7 | 73.1 | 82.6 | 93.1 |

Table 28 Body Fat Ratio

| Sex   | Age | N   | $\bar{X}$ | SD  | P <sub>3</sub> | P <sub>10</sub> | P <sub>25</sub> | P <sub>35</sub> | P <sub>50</sub> | P <sub>65</sub> | P <sub>75</sub> | P <sub>90</sub> | P <sub>97</sub> |
|-------|-----|-----|-----------|-----|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Men   | 20~ | 184 | 17.6      | 6.4 | 10.1           | 11.5            | 13.2            | 14.4            | 15.6            | 18.4            | 20.2            | 26.8            | 34.1            |
|       | 25~ | 250 | 20.7      | 7.4 | 10.7           | 13.0            | 14.8            | 16.7            | 19.2            | 22.7            | 25.4            | 29.8            | 38.0            |
|       | 30~ | 270 | 22.9      | 7.1 | 11.4           | 14.4            | 17.8            | 19.6            | 22.3            | 24.6            | 27.3            | 32.0            | 39.8            |
|       | 35~ | 342 | 22.5      | 6.7 | 11.4           | 14.1            | 17.4            | 19.3            | 22.0            | 24.9            | 26.8            | 32.3            | 36.5            |
|       | 40~ | 395 | 23.5      | 7.7 | 11.8           | 14.4            | 17.9            | 19.8            | 22.9            | 25.8            | 28.1            | 33.6            | 39.8            |
|       | 45~ | 297 | 23.0      | 7.3 | 11.1           | 14.4            | 17.6            | 19.6            | 22.0            | 24.6            | 27.9            | 32.6            | 38.5            |
|       | 50~ | 155 | 22.2      | 7.1 | 10.9           | 13.6            | 17.6            | 18.8            | 21.0            | 24.2            | 25.8            | 30.2            | 40.8            |
|       | 55~ | 59  | 21.0      | 6.6 | 10.8           | 14.6            | 16.5            | 17.2            | 20.3            | 22.2            | 24.1            | 27.3            | 41.9            |
| Women | 20~ | 190 | 27.6      | 6.5 | 17.9           | 20.3            | 23.3            | 24.5            | 26.7            | 29.6            | 31.0            | 35.3            | 43.8            |
|       | 25~ | 351 | 27.7      | 5.9 | 17.4           | 20.0            | 23.9            | 25.1            | 27.3            | 29.6            | 31.6            | 35.4            | 40.2            |
|       | 30~ | 297 | 30.6      | 7.2 | 19.4           | 21.9            | 25.3            | 27.1            | 30.7            | 33.2            | 35.2            | 39.5            | 45.0            |
|       | 35~ | 328 | 32.8      | 7.4 | 20.5           | 23.3            | 27.6            | 29.0            | 32.4            | 35.7            | 37.7            | 43.1            | 48.7            |
|       | 40~ | 313 | 34.1      | 7.6 | 20.9           | 25.9            | 29.0            | 30.7            | 33.3            | 35.9            | 38.5            | 43.6            | 49.9            |
|       | 45~ | 241 | 34.4      | 6.9 | 20.2           | 25.6            | 29.6            | 32.4            | 34.8            | 37.1            | 38.8            | 43.0            | 47.3            |
|       | 50~ | 199 | 35.6      | 8.0 | 19.5           | 26.4            | 30.1            | 32.1            | 35.4            | 38.3            | 40.7            | 46.2            | 50.6            |
|       | 55~ | 90  | 35.0      | 8.2 | 20.0           | 25.3            | 29.5            | 32.1            | 34.6            | 37.1            | 40.1            | 47.4            | 50.9            |

Table 29 TCH (mmol/L)

| Sex | Age | N   | $\bar{X}$ | SD    | P <sub>3</sub> | P <sub>10</sub> | P <sub>25</sub> | P <sub>35</sub> | P <sub>50</sub> | P <sub>65</sub> | P <sub>75</sub> | P <sub>90</sub> | P <sub>97</sub> |
|-----|-----|-----|-----------|-------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Men | 20~ | 81  | 4.781     | 0.956 | 3.235          | 3.786           | 4.097           | 4.396           | 4.677           | 4.919           | 5.217           | 6.238           | 6.647           |
|     | 25~ | 153 | 5.120     | 1.104 | 3.381          | 3.894           | 4.312           | 4.608           | 4.990           | 5.407           | 5.752           | 6.574           | 7.328           |
|     | 30~ | 193 | 5.489     | 1.047 | 3.904          | 4.343           | 4.759           | 5.054           | 5.278           | 5.689           | 6.159           | 6.913           | 7.644           |
|     | 35~ | 240 | 5.674     | 1.009 | 3.895          | 4.465           | 5.029           | 5.294           | 5.612           | 5.939           | 6.213           | 7.018           | 7.890           |
|     | 40~ | 298 | 5.725     | 1.038 | 4.049          | 4.379           | 5.014           | 5.240           | 5.658           | 6.034           | 6.322           | 7.119           | 7.727           |
|     | 45~ | 222 | 5.764     | 1.018 | 3.959          | 4.389           | 5.117           | 5.347           | 5.829           | 6.101           | 6.410           | 7.006           | 7.633           |
|     | 50~ | 118 | 5.956     | 0.964 | 4.054          | 4.679           | 5.306           | 5.558           | 5.938           | 6.211           | 6.566           | 7.222           | 7.944           |
|     | 55~ | 46  | 5.851     | 0.867 | 4.279          | 4.645           | 5.307           | 5.442           | 5.680           | 6.051           | 6.502           | 7.100           | 7.708           |

|       |     |     |       |       |       |       |       |       |       |       |       |       |       |
|-------|-----|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Women | 20~ | 116 | 4.881 | 0.852 | 3.521 | 3.881 | 4.308 | 4.494 | 4.732 | 5.156 | 5.365 | 5.886 | 6.812 |
|       | 25~ | 239 | 4.988 | 0.790 | 3.646 | 4.113 | 4.418 | 4.620 | 4.875 | 5.235 | 5.450 | 6.159 | 6.685 |
|       | 30~ | 212 | 5.036 | 0.958 | 3.487 | 3.940 | 4.420 | 4.684 | 4.964 | 5.270 | 5.543 | 6.182 | 7.133 |
|       | 35~ | 254 | 5.151 | 0.982 | 3.508 | 4.093 | 4.483 | 4.752 | 5.051 | 5.396 | 5.713 | 6.390 | 7.515 |
|       | 40~ | 243 | 5.348 | 0.977 | 3.652 | 4.211 | 4.677 | 4.905 | 5.322 | 5.666 | 5.931 | 6.566 | 7.283 |
|       | 45~ | 189 | 5.636 | 1.031 | 4.075 | 4.428 | 4.947 | 5.236 | 5.643 | 5.838 | 6.173 | 6.721 | 8.072 |
|       | 50~ | 158 | 6.176 | 1.109 | 4.418 | 4.919 | 5.327 | 5.704 | 6.094 | 6.521 | 6.888 | 7.660 | 8.731 |
|       | 55~ | 72  | 6.118 | 0.908 | 4.262 | 5.018 | 5.548 | 5.763 | 6.095 | 6.430 | 6.670 | 7.378 | 7.922 |

Table 30 HDL (mmol/L)

| Sex   | Age | N   | $\bar{X}$ | SD    | P <sub>3</sub> | P <sub>10</sub> | P <sub>25</sub> | P <sub>35</sub> | P <sub>50</sub> | P <sub>65</sub> | P <sub>75</sub> | P <sub>90</sub> | P <sub>97</sub> |
|-------|-----|-----|-----------|-------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Men   | 20~ | 81  | 1.322     | 0.269 | 0.906          | 0.998           | 1.147           | 1.194           | 1.279           | 1.357           | 1.452           | 1.680           | 1.958           |
|       | 25~ | 154 | 1.280     | 0.361 | 0.795          | 0.897           | 1.021           | 1.117           | 1.214           | 1.360           | 1.475           | 1.748           | 2.219           |
|       | 30~ | 193 | 1.229     | 0.323 | 0.752          | 0.873           | 1.001           | 1.081           | 1.204           | 1.324           | 1.375           | 1.664           | 1.850           |
|       | 35~ | 240 | 1.215     | 0.285 | 0.785          | 0.878           | 1.027           | 1.082           | 1.186           | 1.288           | 1.393           | 1.567           | 1.833           |
|       | 40~ | 297 | 1.190     | 0.288 | 0.763          | 0.871           | 0.990           | 1.041           | 1.139           | 1.254           | 1.359           | 1.609           | 1.832           |
|       | 45~ | 222 | 1.199     | 0.318 | 0.704          | 0.871           | 0.999           | 1.043           | 1.128           | 1.238           | 1.344           | 1.652           | 2.020           |
|       | 50~ | 118 | 1.264     | 0.331 | 0.807          | 0.890           | 1.033           | 1.099           | 1.207           | 1.315           | 1.430           | 1.783           | 2.046           |
|       | 55~ | 46  | 1.373     | 0.345 | 0.868          | 0.984           | 1.077           | 1.199           | 1.341           | 1.459           | 1.544           | 1.968           | 2.207           |
| Women | 20~ | 116 | 1.611     | 0.350 | 0.905          | 1.209           | 1.347           | 1.488           | 1.588           | 1.743           | 1.831           | 2.076           | 2.291           |
|       | 25~ | 239 | 1.567     | 0.344 | 1.001          | 1.141           | 1.312           | 1.390           | 1.574           | 1.694           | 1.787           | 2.020           | 2.251           |
|       | 30~ | 212 | 1.537     | 0.410 | 0.932          | 1.075           | 1.280           | 1.359           | 1.507           | 1.600           | 1.749           | 2.039           | 2.248           |
|       | 35~ | 254 | 1.515     | 0.367 | 0.913          | 1.082           | 1.246           | 1.375           | 1.467           | 1.586           | 1.718           | 2.008           | 2.343           |
|       | 40~ | 243 | 1.517     | 0.351 | 0.913          | 1.073           | 1.264           | 1.353           | 1.499           | 1.648           | 1.746           | 2.025           | 2.196           |
|       | 45~ | 189 | 1.548     | 0.392 | 0.922          | 1.082           | 1.267           | 1.385           | 1.529           | 1.688           | 1.766           | 2.076           | 2.361           |
|       | 50~ | 158 | 1.589     | 0.465 | 0.924          | 1.075           | 1.283           | 1.359           | 1.519           | 1.666           | 1.844           | 2.227           | 2.818           |
|       | 55~ | 72  | 1.488     | 0.406 | 0.780          | 1.013           | 1.209           | 1.381           | 1.470           | 1.641           | 1.719           | 2.014           | 2.405           |

Table 31 TG (mmol/L)

| Sex | Age | N   | $\bar{X}$ | SD    | P <sub>3</sub> | P <sub>10</sub> | P <sub>25</sub> | P <sub>35</sub> | P <sub>50</sub> | P <sub>65</sub> | P <sub>75</sub> | P <sub>90</sub> | P <sub>97</sub> |
|-----|-----|-----|-----------|-------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Men | 20~ | 81  | 1.083     | 0.641 | 0.493          | 0.534           | 0.728           | 0.791           | 0.938           | 1.057           | 1.209           | 1.802           | 2.774           |
|     | 25~ | 154 | 1.244     | 0.836 | 0.444          | 0.552           | 0.749           | 0.847           | 1.030           | 1.239           | 1.527           | 2.039           | 3.666           |
|     | 30~ | 193 | 1.509     | 1.001 | 0.530          | 0.677           | 0.920           | 1.026           | 1.216           | 1.521           | 1.857           | 2.537           | 4.171           |
|     | 35~ | 240 | 1.787     | 1.878 | 0.556          | 0.698           | 0.981           | 1.144           | 1.364           | 1.615           | 1.980           | 2.984           | 5.480           |
|     | 40~ | 297 | 1.740     | 1.165 | 0.527          | 0.705           | 0.986           | 1.160           | 1.453           | 1.753           | 2.119           | 3.045           | 5.134           |

|           |     |     |       |       |       |       |       |       |           |           |       |           |       |
|-----------|-----|-----|-------|-------|-------|-------|-------|-------|-----------|-----------|-------|-----------|-------|
| Wom<br>en | 45~ | 222 | 1.563 | 1.015 | 0.487 | 0.629 | 0.912 | 1.082 | 1.28<br>6 | 1.64<br>3 | 1.947 | 2.68<br>9 | 4.545 |
|           | 50~ | 118 | 1.587 | 0.803 | 0.567 | 0.803 | 1.008 | 1.161 | 1.47<br>9 | 1.71<br>3 | 1.845 | 2.59<br>5 | 4.124 |
|           | 55~ | 46  | 1.256 | 0.515 | 0.291 | 0.625 | 0.975 | 1.060 | 1.16<br>9 | 1.31<br>6 | 1.508 | 2.10<br>9 | 2.684 |
|           | 20~ | 116 | 0.788 | 0.340 | 0.318 | 0.427 | 0.547 | 0.610 | 0.72<br>4 | 0.87<br>8 | 0.962 | 1.29<br>8 | 1.488 |
|           | 25~ | 239 | 0.850 | 0.399 | 0.365 | 0.433 | 0.587 | 0.665 | 0.76<br>4 | 0.89<br>2 | 0.997 | 1.39<br>4 | 1.753 |
|           | 30~ | 211 | 0.911 | 0.512 | 0.354 | 0.440 | 0.617 | 0.683 | 0.79<br>5 | 0.94<br>7 | 1.102 | 1.44<br>3 | 2.326 |
|           | 35~ | 254 | 0.908 | 0.467 | 0.376 | 0.502 | 0.614 | 0.694 | 0.81<br>9 | 0.93<br>3 | 1.082 | 1.31<br>3 | 2.209 |
|           | 40~ | 243 | 0.971 | 0.531 | 0.310 | 0.479 | 0.664 | 0.748 | 0.86<br>5 | 1.01<br>8 | 1.170 | 1.58<br>0 | 1.994 |
|           | 45~ | 189 | 1.135 | 0.803 | 0.409 | 0.547 | 0.692 | 0.782 | 0.95<br>9 | 1.10<br>2 | 1.324 | 1.83<br>4 | 2.828 |
|           | 50~ | 158 | 1.190 | 0.604 | 0.430 | 0.545 | 0.728 | 0.855 | 1.09<br>3 | 1.26<br>7 | 1.394 | 2.10<br>0 | 2.789 |
|           | 55~ | 72  | 1.408 | 0.832 | 0.572 | 0.632 | 0.852 | 0.929 | 1.07<br>2 | 1.45<br>4 | 1.742 | 2.60<br>3 | 3.922 |

Table 32 Glucose (mmol/L)

| Sex       | Age | N   | $\bar{X}$ | SD    | P <sub>3</sub> | P <sub>10</sub> | P <sub>25</sub> | P <sub>35</sub> | P <sub>50</sub> | P <sub>65</sub> | P <sub>75</sub> | P <sub>90</sub> | P <sub>97</sub> |
|-----------|-----|-----|-----------|-------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Men       | 20~ | 81  | 4.834     | 0.502 | 3.891          | 4.204           | 4.559           | 4.702           | 4.864           | 4.974           | 5.120           | 5.367           | 5.697           |
|           | 25~ | 154 | 5.012     | 1.738 | 3.671          | 4.297           | 4.583           | 4.662           | 4.882           | 5.057           | 5.209           | 5.568           | 6.526           |
|           | 30~ | 193 | 5.094     | 1.011 | 3.960          | 4.440           | 4.755           | 4.848           | 5.009           | 5.160           | 5.270           | 5.567           | 6.691           |
|           | 35~ | 240 | 5.232     | 1.074 | 4.117          | 4.445           | 4.788           | 4.889           | 5.118           | 5.307           | 5.460           | 5.794           | 7.245           |
|           | 40~ | 297 | 5.282     | 0.944 | 4.214          | 4.620           | 4.814           | 4.978           | 5.165           | 5.350           | 5.497           | 5.847           | 7.418           |
|           | 45~ | 222 | 5.301     | 1.371 | 3.925          | 4.443           | 4.799           | 4.912           | 5.133           | 5.319           | 5.533           | 6.035           | 7.466           |
|           | 50~ | 118 | 5.366     | 0.791 | 4.398          | 4.594           | 4.871           | 5.067           | 5.198           | 5.394           | 5.549           | 6.423           | 7.711           |
|           | 55~ | 46  | 5.583     | 1.272 | 4.340          | 4.545           | 4.845           | 5.003           | 5.302           | 5.524           | 5.721           | 7.017           | 10.340          |
| Wom<br>en | 20~ | 116 | 4.694     | 0.415 | 3.799          | 4.152           | 4.456           | 4.515           | 4.679           | 4.848           | 4.959           | 5.277           | 5.399           |
|           | 25~ | 239 | 4.799     | 0.882 | 4.147          | 4.257           | 4.481           | 4.606           | 4.734           | 4.859           | 4.993           | 5.286           | 5.575           |
|           | 30~ | 212 | 4.801     | 0.466 | 3.830          | 4.325           | 4.508           | 4.616           | 4.811           | 4.998           | 5.112           | 5.351           | 5.664           |
|           | 35~ | 254 | 4.903     | 0.646 | 4.072          | 4.352           | 4.586           | 4.714           | 4.926           | 5.100           | 5.189           | 5.488           | 5.856           |
|           | 40~ | 243 | 5.001     | 0.788 | 4.180          | 4.379           | 4.649           | 4.767           | 4.908           | 5.076           | 5.213           | 5.591           | 6.038           |
|           | 45~ | 189 | 5.196     | 1.102 | 4.173          | 4.444           | 4.738           | 4.836           | 5.026           | 5.209           | 5.376           | 5.819           | 7.098           |
|           | 50~ | 158 | 5.181     | 0.881 | 4.061          | 4.408           | 4.754           | 4.901           | 5.062           | 5.273           | 5.455           | 5.972           | 7.045           |
|           | 55~ | 72  | 5.382     | 1.349 | 3.536          | 4.273           | 4.660           | 4.957           | 5.233           | 5.434           | 5.642           | 6.354           | 10.382          |

Table 33 LDL (mmol/L)

| Sex   | Age | N   | $\bar{X}$ | SD    | P <sub>3</sub> | P <sub>10</sub> | P <sub>25</sub> | P <sub>35</sub> | P <sub>50</sub> | P <sub>65</sub> | P <sub>75</sub> | P <sub>90</sub> | P <sub>97</sub> |
|-------|-----|-----|-----------|-------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Men   | 20~ | 81  | 2.909     | 0.898 | 1.371          | 1.772           | 2.378           | 2.615           | 2.813           | 3.091           | 3.257           | 4.128           | 4.864           |
|       | 25~ | 153 | 3.277     | 1.086 | 1.560          | 2.037           | 2.532           | 2.732           | 3.147           | 3.570           | 3.930           | 4.741           | 5.441           |
|       | 30~ | 193 | 3.547     | 0.998 | 1.738          | 2.443           | 2.915           | 3.114           | 3.420           | 3.757           | 4.146           | 5.044           | 5.481           |
|       | 35~ | 240 | 3.796     | 1.355 | 2.025          | 2.559           | 3.137           | 3.352           | 3.637           | 4.004           | 4.252           | 5.022           | 6.151           |
|       | 40~ | 297 | 3.734     | 1.262 | 1.695          | 2.495           | 3.036           | 3.326           | 3.681           | 4.037           | 4.296           | 4.851           | 5.642           |
|       | 45~ | 222 | 3.889     | 1.134 | 1.838          | 2.516           | 3.223           | 3.578           | 3.927           | 4.216           | 4.516           | 5.130           | 5.593           |
|       | 50~ | 118 | 3.929     | 0.900 | 2.087          | 2.645           | 3.458           | 3.692           | 3.981           | 4.219           | 4.499           | 5.233           | 5.412           |
|       | 55~ | 46  | 3.899     | 0.867 | 2.256          | 2.887           | 3.312           | 3.631           | 3.802           | 4.010           | 4.347           | 5.206           | 5.784           |
| Women | 20~ | 116 | 2.902     | 0.817 | 1.654          | 2.014           | 2.386           | 2.593           | 2.831           | 3.101           | 3.347           | 3.882           | 4.601           |
|       | 25~ | 239 | 3.033     | 0.718 | 1.764          | 2.209           | 2.541           | 2.693           | 2.919           | 3.261           | 3.436           | 4.071           | 4.626           |
|       | 30~ | 212 | 3.105     | 0.823 | 1.748          | 2.187           | 2.523           | 2.736           | 3.028           | 3.354           | 3.556           | 4.084           | 4.970           |
|       | 35~ | 254 | 3.232     | 0.908 | 1.747          | 2.228           | 2.606           | 2.839           | 3.169           | 3.462           | 3.717           | 4.423           | 5.214           |
|       | 40~ | 243 | 3.378     | 0.911 | 1.803          | 2.240           | 2.765           | 3.000           | 3.360           | 3.658           | 3.951           | 4.453           | 5.101           |
|       | 45~ | 189 | 3.622     | 1.199 | 1.989          | 2.504           | 3.039           | 3.237           | 3.523           | 3.825           | 4.066           | 4.587           | 5.723           |
|       | 50~ | 158 | 4.041     | 0.991 | 2.396          | 2.981           | 3.390           | 3.584           | 3.912           | 4.375           | 4.639           | 5.256           | 6.200           |
|       | 55~ | 72  | 3.907     | 0.900 | 2.079          | 2.887           | 3.325           | 3.600           | 3.894           | 4.165           | 4.403           | 5.233           | 5.574           |

Table 34 RBC(g/dl)

| Sex   | Age | N   | $\bar{X}$ | SD  | P <sub>3</sub> | P <sub>10</sub> | P <sub>25</sub> | P <sub>35</sub> | P <sub>50</sub> | P <sub>65</sub> | P <sub>75</sub> | P <sub>90</sub> | P <sub>97</sub> |
|-------|-----|-----|-----------|-----|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Men   | 20~ | 81  | 15.3      | 1.0 | 12.9           | 13.9            | 14.7            | 15.0            | 15.5            | 15.7            | 15.9            | 16.3            | 17.3            |
|       | 25~ | 153 | 15.1      | 1.2 | 12.2           | 13.4            | 14.5            | 14.8            | 15.1            | 15.7            | 15.9            | 16.6            | 17.1            |
|       | 30~ | 193 | 15.1      | 1.1 | 12.4           | 13.7            | 14.5            | 14.8            | 15.2            | 15.5            | 15.7            | 16.5            | 17.0            |
|       | 35~ | 240 | 15.2      | 1.2 | 12.9           | 14.0            | 14.6            | 14.9            | 15.3            | 15.6            | 15.9            | 16.5            | 17.1            |
|       | 40~ | 296 | 15.2      | 1.3 | 12.8           | 13.8            | 14.6            | 14.9            | 15.3            | 15.6            | 15.9            | 16.4            | 17.2            |
|       | 45~ | 219 | 14.9      | 1.2 | 11.9           | 13.5            | 14.4            | 14.7            | 15.0            | 15.4            | 15.6            | 16.3            | 17.2            |
|       | 50~ | 118 | 15.1      | 1.1 | 12.8           | 13.6            | 14.3            | 14.6            | 15.0            | 15.4            | 16.0            | 16.3            | 16.9            |
|       | 55~ | 46  | 14.7      | 1.4 | 10.4           | 13.2            | 13.9            | 14.3            | 14.9            | 15.3            | 15.6            | 16.1            | 17.0            |
| Women | 20~ | 116 | 13.4      | 0.9 | 11.2           | 12.1            | 12.8            | 13.0            | 13.5            | 13.8            | 14.1            | 14.5            | 14.9            |
|       | 25~ | 239 | 13.2      | 1.1 | 11.1           | 11.9            | 12.7            | 13.0            | 13.3            | 13.6            | 13.9            | 14.4            | 15.1            |
|       | 30~ | 212 | 13.3      | 1.0 | 11.0           | 12.0            | 12.7            | 12.9            | 13.3            | 13.7            | 14.0            | 14.5            | 15.1            |
|       | 35~ | 254 | 13.0      | 1.2 | 10.4           | 11.3            | 12.4            | 12.8            | 13.1            | 13.5            | 13.8            | 14.5            | 15.1            |
|       | 40~ | 243 | 13.0      | 1.3 | 9.5            | 11.3            | 12.5            | 12.9            | 13.2            | 13.6            | 13.8            | 14.4            | 14.8            |
|       | 45~ | 189 | 13.0      | 1.5 | 9.4            | 10.8            | 12.4            | 12.9            | 13.3            | 13.6            | 13.9            | 14.4            | 15.0            |
|       | 50~ | 158 | 13.4      | 1.1 | 10.8           | 12.2            | 12.8            | 13.0            | 13.4            | 13.8            | 14.0            | 14.8            | 15.2            |
|       | 55~ | 72  | 13.3      | 1.2 | 10.6           | 11.4            | 12.7            | 13.0            | 13.3            | 13.8            | 14.1            | 15.0            | 15.4            |

## Appendixes

### Questionnaire for Adults Fitness Survey in Macao, 2001

#### Group A (20-39 years old)

Name Sex Age  
Working Address Card Number

**Personal information**

1 · Date of the test (Y/M/D)  2 · Birth date (Y/M/D)

3 · Place of birth \_\_\_\_\_ 4 · Sex M 1 F 2

5 · Years living in Macao \_\_\_\_\_ (Those who was not born in Macao only)

6 · Enterprise Code Number   7 · Types of Occupation   
 1 Brainworker 2 Physical worker

8 · ID No.of Health Insurance

**Questions:**

1.Occupation :

- |  |                      |
|--|----------------------|
| (1) manager                                | (2) researcher       |
| (3) office clerk                           | (4) waiter or seller |
| (5) technician or assistant professional   | (6) farmer or fisher |
| (7) blue-collar worker                     | (8) craftsman        |
| (9) driver, machine operator and assembler |                      |

2 .Working environment :

- (1) outdoor      (2) indoor (ventilative)      (3) indoor (air-condition used)



3. Education :

- (1) illiteracy;                      (2) elementary school;                      (3) high school;
- (4) University/College;                      (5) master;                      (6) doctor

4, Employment status : : (1) full-time; (2) part-time; (3) Out of work

5, Have you been in sick in the past 5 years ? ( if you answer “ no”, go to question 7 please.) :

- (1) yes; (2) no

6, Diseases you have ( only select the most 3 serious diseases ):

- (1) cancer;                      (2) circulatory diseases                      (3) respiratory diseases;
- (4) accidental hurt;                      (5) digestive system diseases;                      (6) high blood pressure;
- (7) endocrinopathy;                      (8) urinary or reproductive system diseases; (9) diabetes;
- (10) others

7. Do you smoke? (1) no; (2) yes; (3) ever

8. Do you drink? ( if you answer “no”, please go to question 11):

- (1) no;                      (2) yes.

9 · Frequency of drink:

- (1)once per month;                      (2) 1~2 times per week;                      (3) 3~4 times per week; (4) 5~7 times per week

10 · Types of drink:

- (1) alcohol;                      (2) beer;                      (3) yellow wine;
- (4) rice wine;                      (5) wine or ratafee;                      (6) mixed wine

Please answer the following questions according to your situation in recent years.

11 · Do you participate in physical activities at least once per week?:

- (1) yes;                      (2) no

12 · The reason keeps you from participating in exercises:

- (1) no interest; (2) no space; (3) heavy housework;  
(4) no instruction; (5) busy work; (6) other :

13 · What kind of exercises do you often watch?( select at most 3 kinds ) :

- (1) basketball; (2) volleyball; (3) soccer; (4) gymnastics; (5) swimming;  
(6) wushu; (7) boxing; (8) table tennis; (9) billiards; (10) golf;  
(11) badminton; (12) water polo; (13) baseball; (14) softball; (15) weight lifting;  
(16) fence-play; (17) wrestling and judo; (18) other

If you participate in physical activities, please complete question 14-18:

14, Your physical activities ( select at most 3 kinds ):

- (1) basketball; (2) volleyball; (3) soccer; (4) gymnastics; (5) swimming;  
(6) wushu; (7) boxing; (8) table tennis; (9) billiards; (10) golf; (11) badminton;  
(12) water polo; (13) baseball; (14) softball; (15) weight lifting; (16) fence-play;  
(17) wrestling and judo; (18) jogging; (19) hike; (20) qigong; (21) other

15. Time spent in exercises:

- (1) 60 minutes more each time; (2) 30-60 minutes each time; (3) less 30 minutes each time

16. The places where you participate in exercises :

- (1) stadium or arena; (2) park; (3) office or home; (4) public space;  
(5) road or street; (6) club; (7) other

17. Exercises frequency:

- (1) 1~2 times per week; (2) 3~4 times per week; (3) 5 times more per week

18. The purposes participating in exercises :

- (1) improvement ; (2) shaping; (3) disease recovery; (4) competition;  
(5) recreation; (6) sociality; (7) other

**Test indices**

- 1 · Resting heart rate (beats/min)
- 2 · Systolic pressure. (mmHg)
- 3 · Diastolic pressure (mmHg)
- 4 · Vital capacity (ml)
- 5 · Height (cm)
- 6 · weight (kg)
- 7 · Chest girth (cm)
- 8 · Waist girth (cm)
- 9 · Hip girth (cm)
- 10 · Subscapular skinfold thickness (mm)
11. Triceps skinfold thickness (mm)
- 12 · Abdominal skinfold thickness (mm)
- 13 · Step Test Time (S)
- Heart rate after 1 min  Heart rate after 2 min.  Heart rate after 3 min.
- 14 · Grip strength (kg)
- 15 · Back strength (kg)
- 16 · Sit-and-reach (cm)
- 17 · Vertical jump (cm)
18. One foot stand with eyes closed (s)
- 19 · 10m\*4 Shuttle run
- 20 · Selective response time (s) Time 1 (1)  0  Time 2 (2)  0
- 21 · Pull-ups (Male) / Sit-ups within 60 seconds (Female) (times)

# Questionnaire for Adults Fitness Survey in Macao, 2001

## Group B (40-59 years old)

Name \_\_\_\_\_ Sex \_\_\_\_\_ Age \_\_\_\_\_

Working Address \_\_\_\_\_ Card Number \_\_\_\_\_

### Personal information

1 · Date of the test (Y/M/D)

2 · Birth date (Y/M/D)

3 · Place of birth \_\_\_\_\_

4 · Sex    M 1    F 2   

5 · Years living in Macao \_\_\_\_\_ (Those who was not born in Macao only)

6 · Enterprise Code Number

7 · Types of Occupation

1 Brainworker 2 Physical worker

8 · ID No.of Health Insurance

### Questions:

- 1.Occupation :
- (1) manager
  - (3) office clerk
  - (5) technician or assistant professional
  - (7) blue-collar worker
  - (9) driver, machine operator and assembler

- (2) researcher
- (4) waiter or seller
- (6) farmer or fisher
- (8) craftsman

2 .Working environment :

- (1) outdoor
- (2) indoor (ventilative)
- (3) indoor (air-condition used)

3. Education :

- (1) illiteracy; (2) elementary school; (3) high school;  
(4) University/College; (5) master; (6) doctor

4, Employment status : (1) full-time; (2) part-time; (3) Out of work

5, Have you been in sick in the past 5 years? ( if you answer "no", go to question 7 please.) :

- (1) yes; (2) no

6, Diseases you have ( only select the most 3 serious diseases ):

- (1)cancer; (2) circulatory diseases (3) respiratory diseases;  
(4) accidental hurt; (5) digestive system diseases; (6) high blood pressure;  
(7) endocrinopathy; (8) urinary or reproductive system diseases; (9) diabetes;  
(10) others

7. Do you smoke? (1) no; (2) yes; (3) ever

8, Do you drink? ( if you answer "no", please go to question 11):

- (1) no; (2) yes.

9 · Frequency of drink:

- (1)once per month; (2) 1~2 times per week; (3) 3~4 times per week; (4) 5~7 times per week

10 · Types of drink:

- (1) alcohol; (2) beer; (3) yellow wine;  
(4) rice wine; (5) wine or ratafee; (6) mixed wine

Please answer the following questions according to your situation in recent years.

11 · Do you participate in physical activities at least once per week?:

- (1) yes; (2) no :

12 · The reason keeps you from participating in exercises:

- (1) no interest; (2) no space; (3) heavy housework;  
(4) no instruction; (5) busy work; (6) other :

13 · What kind of exercises do you often watch?( select at most 3 kinds ) :

- (1) basketball; (2) volleyball; (3) soccer; (4) gymnastics; (5) swimming;  
(6) wushu; (7) boxing; (8) table tennis; (9) billiards; (10) golf;  
(11) badminton; (12) water polo; (13) baseball; (14) softball; (15) weight lifting;  
(16) fence-play; (17) wrestling and judo; (18) other

If you participate in physical activities, please complete question 14-18:

14, Your physical activities ( select at most 3 kinds ):

- (1) basketball; (2) volleyball; (3) soccer; (4) gymnastics; (5) swimming;  
(6) wushu; (7) boxing; (8) table tennis; (9) billiards; (10) golf; (11) badminton;  
(12) water polo; (13) baseball; (14) softball; (15) weight lifting; (16) fence-play;  
(17) wrestling and judo; (18) jogging; (19) hike; (20) qigong; (21) other

15. Time spent in exercises:

- (1) 60 minutes more each time; (2) 30-60 minutes each time; (3) less 30 minutes each time

16. The places where you participate in exercises :

- (1) stadium or arena; (2) park; (3) office or home; (4) public space;  
(5) road or street; (6) club; (7) other

17. Exercises frequency:

- (1) 1~2 times per week; (2) 3~4 times per week; (3) 5 times more per week

18. The purposes participating in exercises :

- (1) improvement ; (2) shaping; (3) disease recovery; (4) competition;  
(5) recreation; (6) sociality; (7) other

**Test indices**

1 · Resting heart rate (beats/min)

2 · Systolic pressure. (mmHg)

3 · Diastolic pressure (mmHg)

4 · Vital capacity (ml)

5 · Height (cm)

6 · weight (kg)

7 · Chest girth (cm)

8 · Waist girth (cm)

9 · Hip girth (cm)

10 · Subscapular skinfold thickness (mm)

11. Triceps skinfold thickness (mm)

12 · Abdominal skinfold thickness (mm)

13. Step Test Time (S)

Heart rate after 1 min.  Heart rate after 2 min  Heart rate after 3 min.

14 · Grip strength (kg)

15 · Sit-and-reach (cm)

16 · One foot stand with eyes closed (s)

17 · Selective response time (s)  
Time1 (1)

Time2 (2)