



STUDIES IN NORTHERN CHINA

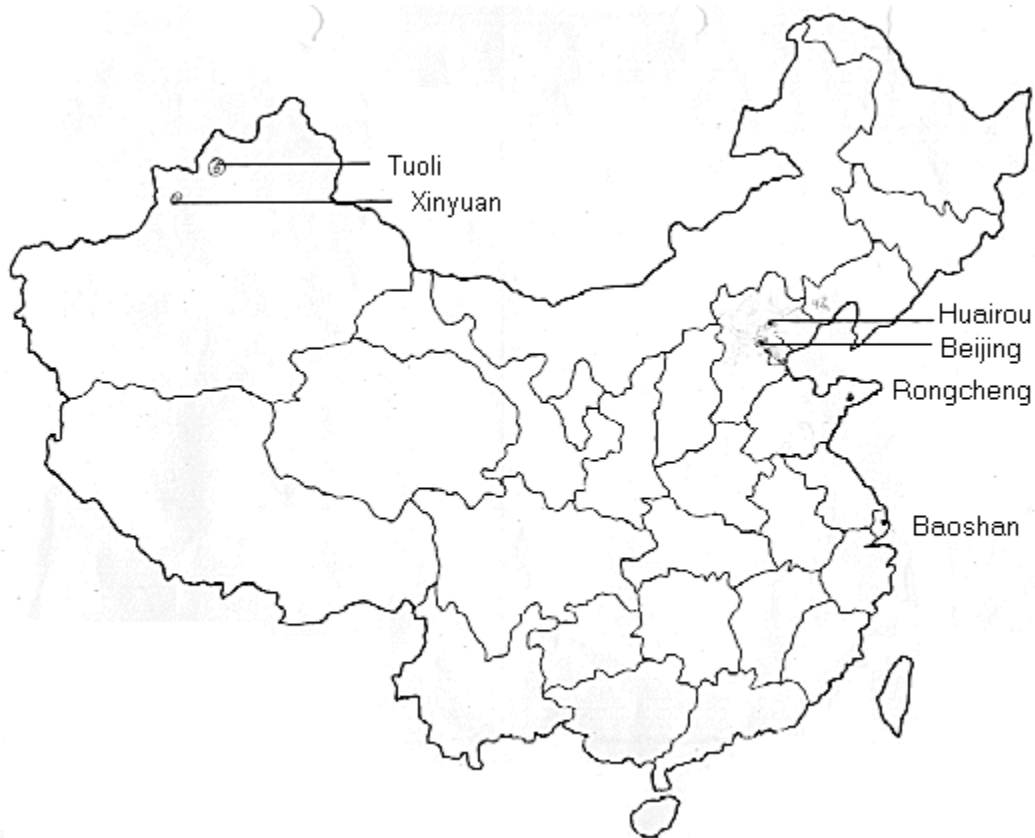
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21.1 GEOGRAPHY AND CLIMATE

From 1986 to 1987, a study on the food habits, lifestyle and health of elderly was carried out in 6 areas of China. The location of the study areas are shown on the map (Figure 21.1). Beijing is a large city, the capital of the country. Huairou is a farming area, geographically close to Beijing. Baoshan and Rongcheng are rural fishing areas on the east coast of China. Xinyuan is a semi-farming semi-pastoral rural area. Tuoli is a pastoral area. The geography and climate of the 6 surveyed areas are shown in Table 21.1. Table 21.2 shows the general demography and state of education and the economy of the surveyed urban and rural counties.

Figure 21.1. Location of six surveyed areas in China



The subjects in Beijing, Huairou, Baoshan and Rongchen were mainly of Han nationality. In Xinyuan and Tuoli, the elderly surveyed were of Kazak nationality. Tables 21.1 and 21.2 were adapted from the statistic yearbook of China. The yearbook data on Beijing included both the central city and suburbs, while our survey was carried out only in the central city, where the educational level and GNP were higher than the average for the whole city. Tuoli is a pastoral county located at the northern border area of China. Owing to transportation difficulties, anthropometry and biochemical data were obtained from only a few subjects.

21.2 METHODOLOGY

This study commenced before the start of the IUNS study. There are similarities and differences in the design and methods used between the two studies.

Table 21.1. Description of the geography and climate of the selected counties.

	Huairou (BH)	Beijing (BX)	Baoshan (SB)	Rongcheng (DE)	Xinyuan (XA)	Tuoli (XT)
General description	Rural farming area	City area	Fishing area	Fishing semi-farming area	Semi-pastoral area	Pastoral
Latitude	40°18'	39°28'-41°05'	31°24'	37°06'	43°24'	45°4'
Climate	Temperate continental monsoon climate	Temperate continental monsoon climate	Subtropics monsoon climate	Temperate monsoon humid climate	Continental semi-arid climate	Continental semi-arid climate
Temp. °C (annual average)	12	11-12	15.7	11.4	8.2	5.2
Precipitation mm (annual average)	500-700	600-650	1128	800	798	318

Table 21.2. Demography, educational and economic state of the surveyed counties.

	Huairou	Beijing	Baoshan	Rongcheng	Xinyuan	Tuoli
Age (median)	25.2	28.2	27.8	27.3	17.4	17.1
>65 years old (% of the total population)	6.1	5.4	6.9	7.0	2.6	2.5
Main nationalities	Han	Han	Han	Han	Kazak and Uygur	Kazak and Uygur
Education level (higher than junior middle school %)	26.26	29.60	28.21	25.61	18.25	17.78
GNP	771	3382	4333	1141	468	379

21.2.1 Objectives

1. Both studies are descriptive with regard to the food habits, health status and lifestyle of the elderly.
2. Both studies had the hypothesis that food habits and lifestyle play an important role in predicting health status in the aged. Therefore, the aim of the two studies is to determine to what extent food habits and lifestyle variables can predict health status in the elderly.

21.2.2 Design

1. Both studies were cross-sectional and elderly participants were not representative of the country but only for the community being studied.
2. In the IUNS study, subjects were randomly selected (from telephone directory, register, electoral roll) or all elderly in the community were taken. Cluster sampling methods were used in the China study (see below).
3. In contrast to the IUNS study, the China study focused on nutrient intake and lacked information on social and economic status.

21.2.3 Subjects

Subjects in IUNS study were aged 70 and over. In the China study, subjects were mainly from 45 to 75 years of age. For comparison with the IUNS study, only the data collected from those aged over 70 years are presented in this chapter.

21.2.4 Variables being measured

The following items were included in both the China study and IUNS study.

1. People, place, living environment and the society
 - geography and climate of surveyed county
 - general demography,
 - rural/ urban background,
 - occupational status,
 - state of economy of the county.
2. Self-reported health status and medical history
 - self-reported diseases
 - self-reported use of medications

- self-reported use of micro-nutrient supplements.
3. Food practices, food and nutrients intake
 - meal pattern
 - cooking methods
 - food indices
 - nutrient intake and density
 - proportion below 2/3 of US RDA (USA Recommended daily allowances).
 4. Anthropometric measures
 - body weight
 - body height
 - BMI
 5. Biochemical measures
 - blood pressure (SBP & DBP)
 - serum albumin and total protein
 - serum lipids (TC, HDL-C, TG)
 - serum calcium
 6. Lifestyle
 - alcohol use
 - smoking habits
 - sleep condition
 - exercise

21.2.5 Population selection and response rate

1. Six areas in China with different food habits were chosen for sampling (see Figure 21.1)
2. A village in one rural area or several residential committees in the city were selected as study communities with the help of local medical workers and local administrators. All elderly within the assigned age range in the community were taken as subjects for the study.
3. For the dietary survey and for the health and lifestyle questionnaire, the interviewers visited each subject at home. Almost all of the elderly visited wanted to participate in the study. The elderly were asked to come to the local hospital or health station for a physical examination and to have fasting blood taken. Those who lived far from the hospital or did not want to have a blood test did not come.

21.2.6 Dietary survey

1. Training of interviewers: Before the start of the study, health workers involved in conducting the survey in each area, came to Beijing for 1-2 weeks for training. They also joined a pilot study in Beijing for standardising the methods being used.
2. In rural areas, 24-hour recall method was used for the dietary survey. Three day dietary records were used in Beijing city, owing to the large variety of the food items available. All subjects were interviewed by well-trained interviewers in their home in order to obtain accurate descriptions of the foods eaten. The health and lifestyle questionnaires were also administered by the interviewer during the home visit.

The energy and nutrient intakes were calculated according to the Chinese food composition table.

21.2.7 Anthropometry

1. Body weight was measured to the nearest 0.5 kg in the morning. The subjects wore light clothes without shoes. Weighing scales were calibrated before use.
2. Standing height was measured to the nearest 0.5 cm. The subjects stood straight, wearing no shoes on a horizontal platform with the heels together.
3. Body mass index (BMI) was calculated by dividing weight in kilograms by square of height in meters.

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

21.3 DEMOGRAPHY

21.3.1 Age

The age of subjects ranged from 45-75 years. For comparison with the IUNS Study, only the data from subjects over 70 years of age were summarised in this chapter.

21.3.2 Profession

The professions of the elderly before retirement are given in Table 21.3. In Beijing City, most of the surveyed elderly were engaged in industry, administration, education, medicine or commercial work. In Hairou, work opportunities were primarily agricultural. Most older men in Baoshan and Roncheng were fishermen; most older women in these two areas were housewives. In Xinyuan and Tuoli, the majority of men and women were herdsmen or housewives respectively.

Table 21.3. Type of occupation by gender (%).

	Huairou		Beijing		Baoshan		Rongcheng		Xinyuan		Tuoli		women
	men	women	men	women	men	women	men	women	men	women	men	women	
Administration	0	0	22.2	18.2	0	0	2.1	2.2	0	0	0	0	
Process worker	4.0	0	44.4	21.2	0	0	2.1	0	0	0	0	0	
Farmer	92.0	53.8	5.6	0	0	0	8.3	0	26.7	16.7	0	0	
Pastor	0	0	0	0	0	0	0	0	53.3	41.7	100.0	0	
Fisherman	0	0	0	0	81.2	53.3	79.2	2.2	0	0	0	0	
House-work	4.0	46.2	5.6	54.5	18.8	46.7	8.3	93.3	20.0	41.7	0	100.0	
Others	0	0	22.2	6.1	0	0	0	2.2	0	0	0	0	
No of subjects	25	26	36	33	16	15	48	45	15	12	10	3	

21.3.3 Marital status

The marital status of the subjects was not included in the questionnaire. According to statistical data for China in 1982, there were only 0.26% unmarried women and 2.78% unmarried men above 50 years of age.

21.4 SELF-REPORTED MEDICATIONS

On average, 33.3% of men and 29.8% of women reported that they took medicines (Table 21.4). The drugs used most frequently were for the treatment of hypertension, coronary heart disease, stomach problems, asthma and for pain-relief. In Beijing, the percentage (45%) of elderly taking medicine was higher than the average in other areas. This might be related to the better medical care available in Beijing city. There are free medical services for most elderly in Beijing.

Table 21.4. The percentage of elderly taking medicine.

	Men		Women	
	Frequency	%	Frequency	%
Yes	50	33.3	40	29.8
No	100	66.7	94	70.2
Total	150	100.0	134	100.0

21.4.1 Self-reported diseases

In the questionnaire, subjects were asked if they had hypertension, coronary heart disease or diabetes. (See Table 21.5). About 39% of men and women reported to have suffered from at least one of the above mentioned diseases. The subjects were also asked if they usually had diarrhoea or constipation; 18.0% of men and of women reported to have had at least one of these problems (See Table 21.6).

Table 21.5. Self-reported diseases (%).

	Men	Women
Hypertension	18.0	20.9
Coronary heart disease	6.0	4.5
Diabetes	6.7	1.5
More than 2 diseases	8.0	11.9
Number of subjects	150	134

Table 21.6. Self-reported diarrhoea or constipation (%).

	Men	Women
Diarrhoea	6.0	7.4
Constipation	10.7	9.0
Diarrhoea and constipation	1.3	1.5
Normal	82.0	82.1
Number of subjects	150	134

21.4.2 Self-reported use of micro-nutrient supplements

Only elderly in Beijing city (27.8% men, 18.2% women) reported taking micro-nutrient supplements, except 1 women from Huairou. Mostly commonly used supplements were vitamins C, E, B-complex and multi-vitamin pills.

21.5 FOOD PRACTICES

21.5.1 Meal pattern

Among the 283 surveyed elderly aged over 70 years in 6 areas, 85.5% took 3 meals or 2 meals plus snack a day; only 6.4% took 4 meals or 3 meals plus snacks daily and 8.1% took 2 meals a day. The differences between meals and snacks is not strict. Staple and non-staple foods tend to

be eaten in relatively larger amounts for meals and meals are usually eaten together with other family members at certain times of the day. Snacks are usually smaller, taken between two meals, and are often comprised of cakes, bread, steamed bread, etc.

21.5.2 Cooking methods

Almost all the elderly subjects had cooked, staple food for their regular meals, such as steamed rice, steamed rolls, baked pancakes and so on. Meat, fish, eggs and most vegetables were deep-fried, boiled or stir-fried. In Beijing the elderly bought small amounts of staple foods from the market. In other areas, foods were almost completely home made.

Elderly in pastoral areas (mainly of Kazak nationality) eat a special staple food called "nong". This is a kind of crusty pancake made of wheat flour and is produced only several times a month. Before eating, people soak the hard "nong" in milk-tea. In other areas, people usually cook or warm up their food just before the meal. Salt was mainly added during cooking. Most Chinese like rather salty food. The average daily amount of salt intake was about 13 grams (table salt plus salt in soy sauce)

21.6 FOOD INTAKES

Estimated food intake data were obtained from the dietary survey. They were classified into the following food groups:

1. rice
2. wheat
3. tubers
4. other cereals
5. legumes
6. legume products
7. light coloured vegetables
8. green vegetables
9. fruit
10. milk and milk products
11. eggs
12. meat and poultry
13. fish and molluscs
14. plant oil
15. animal fat
16. nuts
17. beer, wine and alcohol
18. starch and sugar

Beijing residents obtained their food from local produce as well as from other parts of the country. However, food consumed in the other five areas was mainly locally produced. The food consumption patterns of the elderly were quite different in the areas surveyed. For example, the elderly subjects in Huairou, a farming area, had an average daily vegetable intake of about 469 grams. In Xinyuan, daily vegetable intake was only 57 grams. The dietary survey in Tuoli was carried out during winter and vegetables were not consumed there at that time.

The average fish intakes in Baoshan and Rongcheng were 75 and 50 grams per day, respectively. But in Huairou, Xinyuan and Tuoli fish was not consumed by the elderly. The average daily milk consumption in pastoral areas was more than 200 grams daily, while in other areas (except Beijing), milk was rarely consumed. This suggests that the food availability in each local area determines the food pattern of the elderly (see Table 21.7). Elderly men consumed larger amounts of food than the women. The amount of cereals, vegetables, meat and eggs consumed by the men were 29, 16, 96 and 38% higher, respectively than that consumed by the women (See Table 21.8).

Table 21.7. Average daily food intake in different areas.

Area		N	Cereal	Vegetables	Meat & poultry	Fish & molluscs	Egg	Milk
Huairou	M	25	479	544	20	0	6	0
	F	26	344	398	4	0	17	0
Beijing	M	36	313	269	69	16	43	147
	F	33	260	190	44	6	33	77
Baoshan	M	16	367	142	63	83	11	0
	F	15	262	78	57	66	17	0
Rongcheng	M	48	426	334	28	64	25	0
	F	45	308	306	10	34	8	0
Xinyuan	M	15	411	37	42	0	0	426
	F	12	346	84	39	0	0	90
Tuoli	M	10	279	0	200	0	26	157
	F	3	324	0	100	0	0	123

Table 21.8. Comparison of food intake between men and women (g/day).

	Men	Women
Cereals	391	302
Vegetables	283	243
Meat and poultry	53	27
Eggs	22	16
No of subjects in 6 areas	148	134

21.7. NUTRIENT INTAKES

The mean energy and nutrient intakes are given in Table 21.9. In all areas the energy intake of men was higher than women except in Touli, where only 3 women were studied. In Table 21.10, the percentage of energy derived from fat tended to be higher among women than men. In Beijing and Baoshan, energy derived from fat was about 30%, which was the recommended upper limit for energy from fat.

Table 21.9. Average daily energy and nutrient intakes in 6 areas.

Areas		Protein (g)	Energy (kcal)	Vit A (I.U.)	Carotene (mg)	Fat (g)	Vit B1 (mg)	Vit B2 (mg)	Niacin (mg)	Vit C (mg)	Ca (mg)	P (mg)	Fe (mg)
Huairou	M(25)	60.8	2149	92	19.6	39.0	2.27	1.10	15.6	205	645	1716	37.6
	F(26)	46.0	1550	250	13.8	27.8	1.54	0.83	11.1	142	510	1323	28.4
Beijing	M(36)	60.4	1968	1050	5.7	66.7	1.67	0.94	13.9	91	605	1345	26.7
	F(33)	46.0	1612	628	4.5	60.7	1.41	0.69	11.2	65	485	1071	23.7
Baoshan	M(16)	68.3	2338	408	3.8	65.6	1.42	0.77	15.7	50	536	1247	23.1
	F(15)	42.8	1694	332	1.5	69.3	1.05	0.56	11.0	29	264	958	18.7
Rongcheng	M(48)	69.5	2435	454	2.6	60.4	2.31	0.79	15.6	67	464	1566	29.2
	F(45)	45.2	1546	171	2.0	36.5	1.59	0.52	10.6	45	349	1053	22.8
Xinyuan	M(15)	52.5	1897	205	0.1	44.1	1.80	0.44	13.8	13	379	1292	20.8
	F(12)	44.3	1669	135	0.2	37.2	1.76	0.45	12.3	31	275	1180	18.3
Tuoli	M(10)	72.6	1553	276	0	43.5	1.51	0.67	18.3	2	381	1277	28.4
	F(3)	63.5	1659	316	0	44.2	1.68	0.62	15.8	2	406	1283	28.4

Table 21.10. Percentage of calories from protein and fat.

Areas	Protein		Fat	
	Men	Women	Men	Women
Huairou	11.3	12.0	15.9	16.0
Beijing	11.9	11.4	29.3	34.0
Baoshan	11.4	10.6	26.1	34.5
Rongcheng	11.6	11.4	21.4	21.4
Xinyuan	10.2	10.5	16.9	19.5
Touli	20.1	15.7	23.4	23.5

On average, elderly men had a much higher protein intake than women in all areas. But when protein intake was related to energy, (% of energy) (Table 21.10) the difference between the two sexes was not significant. The lowest protein intake was found in the elderly in Xinyuan. Touli elderly had the highest protein intake. The dietary survey in Xinyuan was carried out in September, and in pastoral areas, meat is consumed mainly in winter time. This may partly account for the low protein intake of the elderly in Xinyuan county. The vitamin and mineral intakes are given in Table 21.9. Vitamin intake by supplements is not taken into account, since the prevalence of usage is very low.

In order to evaluate the adequacy of nutrient intake and compare the results with the other study groups, the nutrient intakes were compared with 2/3 US RDA in Table 21.11. Intake below this cut off point was considered to be at risk of malnutrition. Vitamin A intake of the elderly was low in all six areas. But a large amount of carotene from vegetables raised the average retinol equivalent level. In Xinyuan and Tuoli, very few vegetables were consumed throughout the year. Both carotene and ascorbic acid intake were inadequate; 100% of the elderly in these two areas

had a retinol equivalent below 2/3 US RDA. Dietary intakes of niacin and thiamine were adequate. In agreement with other national dietary surveys in China, riboflavin and calcium were the nutrients most likely to be inadequately consumed. A large proportion of the elderly had riboflavin and calcium intakes below 2/3 US RDA, especially women.

Table 21.11. Percentage of the elderly with nutrient intake below 2/3 US RDA.

Areas	Protein		Calcium		Vit B1		Retinol equiv.		Riboflavin		Ascorbic acid	
	men	women	men	women	men	women	men	women	men	women	men	women
Huairou	20.0	19.2	48.0	61.5	0	0	8.0	7.7	44.0	50.0	4.0	15.4
Beijing	11.1	24.2	36.1	66.7	2.8	0	16.7	33.3	47.2	75.8	11.1	36.4
Baoshan	18.8	20.0	50.0	100.0	25.0	20.0	50.0	86.7	68.8	93.3	43.8	80.0
Rongcheng	10.4	33.3	70.8	84.4	0	2.2	70.8	75.6	79.2	93.3	45.8	60.0
Xinyuan	26.7	41.7	86.7	100.0	6.7	0	100.0	100.0	86.7	91.7	86.7	66.7
Tuoli	10.0	0	90.0	66.7	0	0	100.0	100.0	90.0	66.7	100.0	100.0

21.8 ANTHROPOMETRY

The mean body weight of elderly men over 70 years of age was 59.5 kg. The weight of women in the same age group was 53.8 kg, 5.7 kg less than that of men. The average heights of elderly men and women were 164.1 cm, and 150.8 cm, respectively. Elderly men were 13.3 cm taller than women. The BMI of men and women were 22.1 and 23.7, respectively. Women had a greater BMI than the men. For the comparison of body weight and height of elderly over 70 years of age (oldest) with younger age groups in the same study, (age group 45-59 and 60-69 years) see Table 21.8. Both weight and height decreased with advancing age. The body weight of the oldest men and women was 4.7 kg less than men and women in the middle age group. The body height difference of men and women between these two age groups was 3.1 and 4.6 cm respectively. Spinal compression could partly explain the decrease in height in old age.

Table 21.12. Average body weight, height and BMI of subjects in different age groups.

Years of age	Body height						Body weight						BMI					
	male			Female			male			female			male			female		
	mean	SD	n	mean	SD	n	mean	SD	n	mean	SD	n	mean	SD	n	mean	SD	n
45-59	167.2	6.9	292	155.4	5.7	412	64.2	10.0	288	58.5	10.5	407	23.0	3.0	287	24.2	4.1	407
60-69	165.3	7.0	196	153.7	5.6	213	61.9	10.4	196	54.4	10.7	213	22.7	3.2	196	23.0	4.1	212
Over 70	164.1	7.0	68	150.8	6.7	55	59.5	8.0	67	53.8	11.4	55	22.1	2.8	67	23.7	4.2	55

21.9 BLOOD PRESSURE MEASUREMENT

Blood pressure was taken by experienced, pre-trained medical doctors with a mercury sphygmomanometer. A blood pressure of 160/95 mm Hg and 140/90 mm Hg was the cut-off for the diagnosis of hypertension and the exclusion of hypertension, respectively. Subjects with systolic or diastolic blood pressure which exceeded 160/95 mm Hg were classified as hypertensive or if both systolic and diastolic blood pressures were lower than 140/90 mm Hg were classified as normotensive. A subject whose systolic or diastolic blood pressure was between these two cut points was classified as critically hypertensive.

Average blood pressure, specified by region and gender are listed in Table 21.13. The distribution of hypertension in those areas is listed in Table 21.14. About 70% of men and 63% of women were classified as normotensive and only 19% of men and 25% of women were recorded as hypertensive.

Table 21.13. Systolic and diastolic blood pressure of people over 70 years of age (mm Hg).

	SBP						DBP			
	M			F			M		F	
	mean	SD	n	mean	SD	n	mean	SD	mean	SD
Huairou	140	19	7	168	36	6	82	9	97	25
Beijing	156	37	15	147	36	12	80	12	82	11
Baoshan	150	21	14	138	25	12	80	12	75	15
Rongcheng	161	38	14	177	35	15	85	15	87	15
Xinyuan	164	34	9	175	31	7	85	10	93	12
Tuoli	168	27	9	181	13	2	96	12	122	25
Total (M + F)	158	33	122				85	15		

Table 21.14. Distribution of blood pressure of people over 70 years of age.

	Normal		Hypertension		Critical	
	M	F	M	F	M	F
Huairou	6/7	2/6	1/7	3/6	0/7	1/6
Beijing	13/15	9/12	2/15	2/12	0/15	1/12
Baoshan	11/14	10/12	1/14	1/1	22/14	1/12
Rongcheng	10/14	11/15	3/14	3/15	1/14	1/15
Xinyuan	6/10	3/9	3/10	3/9	1/10	3/9
Tuoli	3/9	0/2	3/9	2/2	3/9	0/2
Total	49/69	35/56	13/69	14/56	7/69	7/56
	71%	63%	19%	25%	10%	12%

21.10 BIOCHEMICAL MEASUREMENTS

21.10.1 Blood collection

Fasting blood samples were collected by venepuncture in the morning. Blood was drawn with a sterilised plastic syringe, using a tourniquet. The needle was inserted into the antecubital vein and blood was drawn slowly into plastic or glass test tubes. Serum were separated and frozen for lipids and protein measurements. Twenty microlitres of whole blood was taken from each blood sample with a calibrated glass capillary immediately after the blood was drawn from the vein. This was put into a test tube containing 5 ml of reagent and kept out of the light for a haemoglobin (cyanmethaemoglobin) measurement by spectrophotometry later in the laboratory.

21.10.2 Serum analysis

All biochemical analysis were carried out at the Institute of Nutrition and Food Hygiene of Chinese Academy of Preventive Medicine. Total serum cholesterol was extracted by isopropanol and reacted with FeCl_3 and concentrated sulphuric acid (Salkowski reaction). HDL-cholesterol was determined by the same method, and total cholesterol was measured after LDL-cholesterol was precipitated by Dextran sulfate- Mg^{2+} . Serum triglyceride was extracted with isopropanol and then saponified and oxidised to formaldehyde and reacted with acetylacetone (Hantzsch reaction) and determined colorimetrically. Serum total protein concentration was determined by Biuret method. The serum albumin was determined by dye-binding technique with bromocresol green.

Results of serum total cholesterol, HDL cholesterol and triglyceride from 6 areas specified by gender and their distribution over and below the normal range are listed in Tables 21.15-21.17. The average total cholesterol of men and women of the 6 areas was 4.65 ± 1.19 mmol/L. If we use 5.2 mmol/L as a cut-off level, 79% of men and 60% of women were in the normal range. The average serum triglyceride of men and women was 1.23 ± 0.66 mmol/L; 89% of men and 78% of women were in the normal range (< 1.7 mmol/L). Serum total protein, albumin and serum calcium are listed in Table 21.18. The mean and standard deviation of men and women were calculated separately. The serum total protein, albumin and calcium were within the normal range.

Table 21.15. Serum total cholesterol, HDL-cholesterol and triglyceride of subjects over 70 years of age (mmol/L).

	Total Cholesterol						HDL-Cholesterol						Triglyceride					
	M		n	F		n	M		n	F		n	M		F		n	
mean	SD	mean		SD	mean		SD	mean		SD	mean		SD	mean	SD	mean		SD
Huairou	4.60	1.00	6	4.37	1.88	3	1.37	0.33	6	1.89	0.91	3	0.90	0.16	6	1.02	0.23	2
Beijing	4.05	0.58	14	4.52	0.74	8	1.35	0.27	14	1.43	0.36	8	1.02	0.33	14	1.16	0.84	8
Baoshan	5.29	0.96	6	5.24	2.12	5	1.67	0.37	6	1.62	0.45	5	1.25	0.38	6	1.45	0.37	5
Rongcheng	4.32	0.86	8	5.19	1.21	9	1.31	0.37	8	1.40	0.32	9	1.02	0.56	7	1.60	0.99	7
Xinyuan	3.74	0.90	4	5.32	1.15	4	1.61	0.12	4	2.21	0.35	4	1.84	0.98	4	1.68	1.20	4
Tuoli	5.02	1.65	9	4.41	1	1	1.11	0.24	8	0.86	1	1	1.11	0.60	7	1.36	1	1
Total (M + F)	4.65	1.19	77	4.45			0.42	0.76	76	1.23	0.66	71						

Table 21.16. Distribution of serum total cholesterol of subjects over 70 years of age.

	<5.2 mmol/L		>5.2 mmol/L	
	M	F	M	F
Huairou	4/6	2/3	2/6	1/3
Beijing	14/14	7/8	0/14	1/8
Baoshan	3/6	3/5	3/6	2/5
Rongcheng	7/8	4/9	1/8	5/9
Xinyuan	4/4	1/4	0/4	3/4
Tuoli	5/9	1/1	4/9	0/1
Total	37/47 (79%)	18/30 (60%)	10/47 (21%)	12/30 (40%)

Table 21.17. Distribution of serum triglyceride of subjects over 70 years of age.

	<1.7 mmol/L		>1.7 mmol/L	
	M	F	M	F
Huairou	6/6	2/2	0/6	0/2
Beijing	14/14	7/8	0/14	1/8
Baoshan	5/6	3/5	1/6	2/5
Rongcheng	6/7	5/7	1/7	2/7
Xinyuan	2/4	3/4	2/4	1/4
Tuoli	6/7	1/1	1/7	0/1
Total	39/44 (89%)	21/27 (78%)	5/44 (11%)	6/27 (22%)

Table 21.18. Serum total protein, albumin and calcium of subjects over 70 years of age.

	Total Protein (g/L)						Albumin (g/L)						Calcium (mmol/L)					
	M		F		M		F		M		F		M		F			
	mean	SD	n	mean	SD	n	mean	SD	n	mean	SD	n	mean	SD	n	mean	SD	n
Huairou	75.2	5.0	6	77.5	4.1	3	39.9	2.6	6	42.9	3.3	3	2.55	0.23	6	2.61	0.36	5
Beijing	73.0	6.6	14	72.6	4.2	8	41.9	5.7	12	41.4	2.8	7	2.36	0.37	11	2.31	0.32	8
Baoshan	75.9	4.1	6	78.1	6.8	5	42.1	1.68	5	44.4	4.1	5	2.47	0.11	2	2.27	0.54	3
Rongcheng	71.8	6.7	8	80.3	3.3	9	38.6	4.4	3	42.0	1.9	7	2.65	0.29	6	2.85	0.43	8
Xinyuan	71.9	5.5	4	70.5	6.5	4	38.4	4.2	4	40.4	2.2	4	2.69	0.26	4	2.77	0.12	4
Tuoli	74.1	7.5	9	63.8		1	37.6	2.7	7	31.1		1	2.54	0.26	7	2.25		1
Total (M + F)	74.6	0.6	65				40.84	4.1	64				2.54	0.36	65			

21.11 ALCOHOL USE

Alcohol intake (Table 21.19) was obtained from the dietary survey. "Alcohol" includes beer, wine and liquor. About 25% of elderly men and only 3% of women drank alcohol during the survey. The average alcohol intake for men was 146 g, which was higher than the amount (103 g) taken by the women. None of the elderly subjects in Xinyuan and Tuoli (Kazak nationality) were found to drink alcohol during the survey. Many Kazak people set aside the habit of drinking alcohol as they age.

Table 21.19. Alcohol intake of the elderly.

	N	Men % amount (g/day)(1)	average	N	Women % amount (g/day)(1)	average
Huairou	25	12.0	91.7	26	0	0
Beijing	36	30.6	62.9	33	0	0
Baoshan	16	56.2	186.1	15	13.3	200.0
Rongcheng	48	31.2	194.8	45	4.4	5.85
Xinyuan	15	0	0	12		0
Tuoli	10	0	0	3	0	0
Total	150	25.3	146.4	134	3.0	102.9

(1) Not including the elderly who did not drink.

21.12 SMOKING HABITS

Table 21.20 shows the smoking status of men and women. About 19% of men smoked, compared with only 3.0% of women. The average number of cigarettes smoked per day by men was 13.7, compared to 9.0 by women. The highest percentage of smokers was found in Baoshan men (68.8%). Smokers were not found among the elderly subjects surveyed in Xinyuan and Tuoli.

Table 21.20. Cigarette smoking.

	Men			Women		
	n	%	number of cigs/day	n	%	number of cigs/day(1)
Huairou	25	20.0	11.0	26	3.8	4.0
Beijing	36	16.7	11.7	33	3	6.0
Baoshan	16	68.8	17.8	15	6.7	20.0
Rongcheng	48	14.6	11.1	45	0	0
Xinyuan	15	0	0	12	0	0
Tuoli	10	0	0	3	0	0
Total	150	19.3	13.7	134	3.0	9.0

(1) Not including the elderly who did not smoke.

21.13 SLEEPING CONDITIONS

About 89% of men and 81% women reported sleeping well (>6 hours per day) and only 4.7% of men and 11.2% of women experienced insomnia. It seems that more elderly women than elderly men had sleeping problems (Table 21.21).

Table 21.21. Sleeping conditions of the elderly.

	Men			Women		
	n	>6 h /day	sleepless-ness	n	>6 h /day	sleepless-ness
Huairou	25	80.0	8.0	26	88.5	11.5
Beijing	36	91.7	2.8	33	72.7	15.2
Baoshan	16	93.7	0	15	93.3	6.7
Rongcheng	48	93.7	4.2	45	77.8	8.9
Xinyuan	15	80.0	6.7	12	83.3	8.3
Tuoli	10	90.0	10.0	3	66.7	33.3
Total	150	89.3	4.7	134	80.6	11.2

21.14 EXERCISE

About 28.0% of men and 15.0% of women reported exercising. More men undertook exercise than women. The highest percentage of subjects taking exercise was found among the men in Beijing. The exercises undertaken most frequently were jogging, ball playing and running. Old people in rural areas usually took part in physical labour rather than exercise.

21.15 CONCLUSION AND LIMITATIONS

Among our 6 regions of Northern China, data was collected on 150 persons over 70 years of age. Due to the small sample size, comparisons across sites was difficult. Thus, the discussion and comparative analyses by region should be regarded as preliminary, at best.

21.16 PRINCIPLE INVESTIGATORS OF CHINA STUDY

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21.17 SUMMARY

- A descriptive study of the food intakes, health and lifestyle of subjects aged 45-75 (150

aged 70+) was conducted between 1986-1987 in the central city of Beijing and 5 rural areas (Huairou, Baoshan, Rongcheng, Xinyuan, Tuoli) between 1986-1987.

- The study had a cross-sectional design and samples were representative of the community studied. Response rates were high in all areas (>80%).
- The questionnaires were interviewer administered. In rural areas, the 24-hour recall method was used for the dietary survey; 3-day dietary records were used in Beijing city, owing to the large variety of the food items available.
- Blood tests (lipids, protein), blood pressure and anthropometric measurements (height, weight) were also performed.

CHAPTER 21

NORTHERN CHINA

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