

## The Second National Growth and Development Survey of Children in China, 1985: children 0 to 7 years

XUAN ZHANG and ZE HUANG†

Coordinating Study Group on the Physical Growth and Development of Children, Capital Institute of Paediatrics, Beijing, China.

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**Summary.** To evaluate the normal physical growth and development of Chinese children and to compare the nutritional status of today with that of ten years ago, a second national cross-sectional growth survey was undertaken in the same urban and suburban rural areas of nine main cities in China in 1985 as in 1975. In this survey 152 874 boys and girls from birth to age 7·0 years were measured for weight, height, sitting height, and chest, head and upper arm circumferences. Compared with the results in 1975, the condition of growth and development of children for both boys and girls from urban or suburban rural areas has been relatively much improved. Average weight and height had increased in the past 10 years by 0·40 kg and 1·8 cm respectively, in 6-7-year-old children. The greater part of the increase in height has been due to increase in leg length. The urban-rural difference in stature has become smaller, as the increase has been greater in rural areas. The data from this survey can be used as a new growth standard for Chinese children.

### 1. Introduction

China is a developing country with a population of one billion amongst which 130 million (13%) are children under 7 years old. Obviously, the health and nutritional status of these Chinese children is of importance to the whole Chinese people as well as to the children of the whole world.

Studies of child growth and development were carried out in China as early as the 1930s (Zhu 1965), but only of unrepresentative urban 'elite' groups. During the 1950s and 1960s, a number of surveys were undertaken locally and sporadically in different age groups and in different parts of the country (Qin and Sui 1956, Wu 1957). In 1975, the first national child growth survey was carried out (Institute of Paediatrics of CAMS 1977a,b, Zhang 1976 and 1977). In this large-scale cross-sectional survey, 274 000 children of both sexes aged 0-18 years, half in urban and half in suburban rural areas, of nine main cities of China, were measured for five anthropometric variables: weight, height, sitting height, chest circumference and head circumference. The findings of the study provided the growth norms of Chinese children and adolescents for clinical and preventive medicine (Zhang 1976, Zhang and Qin 1985). At that time it was suggested that every ten years we would carry out a new national growth survey. The 1975 study was recognized as a milestone in the history of child growth study in China.

In April-October 1985, the second national cross-sectional growth and development survey was undertaken in the same areas as in 1975. The aims of this study were as follows.

- (1) To describe the normal physical growth and development, and the nutritional status of Chinese children 0-7 years in 1985 and provide an updated growth standard.
- (2) To compare the five growth measurements with those of the 1975 study.

†National Institute of Child Health and Human, Development, National Institutes of Health, Bethesda, Maryland, U.S.A.

(3) To compare the growth of Chinese children with similar studies from other countries.

Because of the limited space we submit only a part of the results derived from the above large-scale survey.

## 2. Subjects and Methods

The overall survey design, sampling method, the selection and exclusion criteria for subjects and the measurement techniques were the same as those used in the 1975 study (Zhang 1976, 1977) except for some added measurements and questionnaire items (Capital Institute of Paediatrics 1985).

### *Subjects*

The subjects consisted of 152 874 healthy children of Han nationality under 7 years old, 76 440 (50%) boys and 76 434 (50%) girls; 79 194 (51·8%) from urban and 74 680 (48·2%) from rural areas.

These children were classified into 22 age groups. Except the first groups of 0–3 days and the last group of 6·0–6·99 years, the remainder were divided at monthly (1·0–5·9 months), bimonthly (6·0–11·9 months), 3-monthly (12·0–23·9 months) and 6-monthly (2·0–5·99 years) intervals. The sample size was at least 150–200 for each sex-age group in each area (urban/rural) of each city.

Children with malformations or diseases severely affecting their growth and development and general health were not included in the study. In the group aged 0–3 days, babies with birthweight under 2 500 g, preterm babies and twins were excluded, as they were in 1975.

### *Organization*

The Capital Institute of Paediatrics (formerly named the Institute of Paediatrics, the Chinese Academy of Medical Sciences) was appointed to organize and coordinate the Second National Growth and Development Survey of Children (GDSC). Under the direction of the Beijing Steering Committee, the 9 coordinating study subgroups on GDSC worked simultaneously, following a uniform plan, organizing and training local survey teams, carrying out the measurements, checking cards and constructing local growth norms.

About 1 200 medical and health workers from 9 cities took part in the survey teams. There were 13 people in each team. They were physicians/paediatricians, nurses and technicians. All of them had been trained before starting the survey.

### *Survey locations*

The nine cities surveyed were Harbin, Beijing and Xian in the northern part; Shanghai, Nanjing and Wuhan in the central part; Guangzhou, Fuzhou and Kunming in the southern part of China.

### *Survey items and the measurement techniques*

All children in this study had six anthropometric variables measured—weight, height (supine length if under 3 years), sitting height (crown–rump under 3 years), chest circumference, head circumference and upper arm circumference. All the somatic measurements were carried out by specially trained technicians or nurses following a physical examination of the children and administration of a questionnaire to their parents. The techniques of measurement were the same as in 1975. (Zhang 1976)

The questionnaire asked (1) the parents' occupation and education; (2) the present feeding habits, the age of adding supplemental food and the age of weaning; (3) the gross motor development (the months of age for sitting, standing, and walking independently); (4) the number of teeth and presence of dental caries; the closing time of the fontanel.

### Time of survey

This survey started in April 1985 and finished in October of the same year. All the measurements were carried out at least one hour after a meal, between approximately 8 a.m. and 4 p.m.

### Data statistics and processing

After checking the survey cards, the data were computerized in the Department of Statistics, Beijing Union Medical College, Chinese Academy of Medical Sciences.

## 3. Results

### The physical growth and development of Chinese children in 1985.

The means of weight, height, sitting height, chest circumference, head circumference and upper arm circumference are given in tables 1 and 2.

Table 1. Measurements of Chinese urban children 0-7 years, 1985.

Sex	Age Group	No.	Weight (Kg)		Height (cm)		Sitting H. (cm)		Chest C. (cm)		Head C. (cm)		Upper Arm C. (cm)	
			Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Boys	0~3 day	1800	3.21	0.37	50.2	1.7	33.5	1.4	32.3	1.5	33.9	1.2	10.5	0.8
	1 mo+	1800	4.90	0.61	56.5	2.3	37.5	1.8	37.3	1.8	37.8	1.2	12.1	1.1
	2 mo+	1800	6.02	0.73	60.1	2.4	39.7	1.8	39.8	1.8	39.6	1.3	13.3	1.1
	3 mo+	1800	6.74	0.77	62.4	2.4	41.0	1.7	41.2	1.9	40.8	1.3	13.9	1.1
	4 mo+	1800	7.36	0.80	64.5	2.4	42.1	1.8	42.3	2.0	42.0	1.2	14.3	1.1
	5 mo+	1800	7.79	0.83	66.3	2.3	43.0	1.7	43.0	1.9	42.8	1.2	14.4	1.1
	6 mo+	1800	8.39	0.94	68.6	2.6	44.1	1.8	43.9	2.1	43.9	1.3	14.6	1.1
	8 mo+	1800	9.00	0.98	71.3	2.6	45.5	1.8	44.9	2.1	45.0	1.3	14.7	1.1
	10 mo+	1800	9.44	1.04	73.8	2.7	46.7	1.9	46.6	2.0	46.7	1.3	14.7	1.2
	12 mo+	1800	9.87	1.04	76.5	2.8	47.9	2.0	46.2	2.0	46.3	1.3	14.7	1.1
	15 mo+	1800	10.38	1.12	79.2	2.9	49.3	2.0	47.1	2.0	46.8	1.3	14.7	1.1
	18 mo+	1800	10.88	1.14	81.6	3.2	50.4	2.1	47.8	2.0	47.4	1.3	14.9	1.1
	21 mo+	1800	11.42	1.23	84.4	3.2	51.7	2.1	48.4	2.0	47.8	1.3	14.9	1.1
	2.0 yr+	1800	12.24	1.28	87.9	3.5	53.3	2.2	49.4	2.0	48.2	1.3	15.2	1.1
	2.5 yr+	1800	13.13	1.34	91.7	3.7	54.8	2.3	50.2	2.0	48.8	1.3	15.4	1.0
	3.0 yr+	1800	13.95	1.51	95.1	3.7	55.9	2.3	50.9	2.1	49.1	1.3	15.5	1.1
	3.5 yr+	1800	14.75	1.58	98.5	3.9	57.2	2.3	51.7	2.1	49.6	1.2	15.5	1.1
	4.0 yr+	1800	15.61	1.75	102.1	4.2	58.7	2.4	52.3	2.1	49.8	1.3	15.6	1.1
	4.5 yr+	1800	16.49	1.84	105.3	4.3	60.0	2.4	53.0	2.2	50.1	1.3	15.7	1.1
	5.0 yr+	1800	17.39	2.05	108.6	4.5	61.5	2.5	53.8	2.4	50.4	1.4	15.7	1.2
5.5 yr+	1800	18.30	2.13	111.6	4.5	62.7	2.5	54.6	2.3	50.0	1.3	15.9	1.2	
6~7 yr	1800	19.81	2.56	116.2	4.9	64.7	2.6	55.8	2.7	50.9	1.4	16.2	1.4	
Girls	0~3 day	1794	3.12	0.34	49.6	1.6	33.1	1.3	32.2	1.4	33.5	1.3	10.5	0.8
	1 mo+	1800	4.60	0.56	55.6	2.2	36.7	1.7	36.5	1.8	37.1	1.2	11.8	1.0
	2 mo+	1800	5.54	0.66	58.8	2.3	38.7	1.8	38.7	1.8	38.6	1.2	12.9	1.1
	3 mo+	1800	6.22	0.70	61.1	2.1	40.0	1.7	40.1	1.8	39.8	1.2	13.5	1.1
	4 mo+	1800	6.78	0.75	63.1	2.3	41.1	1.7	41.1	1.9	40.9	1.2	13.8	1.1
	5 mo+	1800	7.24	0.79	64.8	2.2	41.9	1.7	41.9	1.9	41.8	1.2	13.9	1.1
	6 mo+	1800	7.78	0.89	67.0	2.5	43.0	1.8	42.9	2.0	42.8	1.2	14.2	1.1
	8 mo+	1800	8.36	0.93	69.7	2.5	44.4	1.8	43.7	2.0	43.8	1.3	14.2	1.1
	10 mo+	1800	8.80	0.97	72.3	2.6	45.6	1.8	44.4	2.0	44.5	1.2	14.3	1.1
	12 mo+	1800	9.24	1.03	75.1	2.7	46.9	1.9	45.1	2.0	45.2	1.3	14.3	1.1
	15 mo+	1800	9.78	1.05	77.9	3.0	48.3	2.0	45.9	1.9	45.8	1.3	14.5	1.1
	18 mo+	1800	10.33	1.09	80.4	3.0	49.6	2.0	46.7	2.0	46.2	1.2	14.6	1.1
	21 mo+	1800	10.87	1.15	83.1	3.1	50.8	2.0	47.3	2.0	46.7	1.2	14.7	1.0
	2.0 yr+	1800	11.66	1.21	86.6	3.5	52.4	2.2	48.2	2.0	47.2	1.2	15.0	1.1
	2.5 yr+	1800	12.55	1.32	90.3	3.6	53.9	2.2	49.1	2.0	47.7	1.2	15.2	1.0
	3.0 yr+	1800	13.44	1.42	94.2	3.7	55.2	2.2	49.8	2.0	48.1	1.2	15.4	1.1
	3.5 yr+	1800	14.26	1.47	97.3	3.8	56.3	2.2	50.6	2.0	48.5	1.3	15.5	1.1
	4.0 yr+	1800	15.21	1.74	101.2	4.1	58.0	2.3	51.2	2.2	48.9	1.3	15.6	1.2
	4.5 yr+	1800	16.12	1.84	104.5	4.2	59.4	2.4	52.0	2.2	49.2	1.3	15.8	1.2
	5.0 yr+	1800	16.79	1.82	107.6	4.2	60.6	2.4	52.4	2.2	49.4	1.3	15.8	1.2
5.5 yr+	1800	17.72	2.17	110.8	4.6	62.1	2.5	53.2	2.5	49.6	1.3	15.8	1.3	
6~7 yr	1800	19.08	2.42	115.1	4.9	64.0	2.6	54.1	2.6	50.0	1.4	16.0	1.3	

Table 2. Measurements of Chinese rural children 0-7 years, 1985.

Sex	Age Group	No.	Weight (Kg)		Height (cm)		Sitting H. (cm)		Chest C. (cm)		Head C. (cm)		Upper Arm C. (cm)	
			Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Boys	0~3 day	1530	3.22	0.38	50.2	1.7	33.5	1.4	32.5	1.4	34.0	1.2	10.4	0.9
	1 mo +	1480	4.95	0.67	56.4	2.6	37.3	2.0	37.3	2.0	37.8	1.4	12.0	1.2
	2 mo +	1480	5.96	0.71	59.7	2.4	39.5	1.9	39.5	1.9	39.6	1.3	13.0	1.1
	3 mo +	1480	6.60	0.79	61.7	2.5	40.6	1.9	40.8	1.9	40.7	1.3	13.4	1.2
	4 mo +	1480	7.19	0.81	63.7	2.4	41.8	1.9	41.8	1.9	41.7	1.4	13.9	1.2
	5 mo +	1470	7.53	0.86	65.3	2.6	42.4	1.8	42.4	1.9	42.6	1.3	14.0	1.1
	6 mo +	1480	8.05	0.88	67.5	2.6	43.6	1.8	43.4	2.0	43.6	1.3	14.1	1.1
	8 mo +	1530	8.58	0.94	70.0	2.6	44.8	1.9	44.2	1.9	44.5	1.3	14.1	1.1
	10 mo +	1530	8.94	0.96	72.3	2.7	45.9	1.9	44.8	2.0	45.1	1.3	14.1	1.1
	12 mo +	1800	9.34	1.02	74.9	2.9	47.1	2.0	45.4	1.9	45.7	1.3	14.1	1.1
	15 mo +	1800	9.81	1.07	77.4	3.1	48.3	2.0	46.3	1.9	46.4	1.3	14.1	1.1
	18 mo +	1800	10.29	1.07	79.6	3.3	49.3	2.1	47.1	2.0	46.9	1.3	14.2	1.1
	21 mo +	1800	10.79	1.18	81.9	3.3	50.4	2.2	47.6	2.0	47.2	1.3	14.3	1.1
	2.0 yr +	1800	11.61	1.20	85.4	3.7	52.1	2.2	48.7	2.1	47.8	1.3	14.6	1.1
	2.5 yr +	1800	12.50	1.27	88.9	3.8	53.5	2.2	49.8	2.0	48.3	1.3	14.8	1.0
	3.0 yr +	1800	13.42	1.38	92.5	3.8	54.7	2.3	50.7	2.0	48.7	1.3	15.0	1.0
	3.5 yr +	1800	14.13	1.41	95.4	4.0	55.8	2.4	51.4	2.0	49.0	1.3	15.1	1.0
	4.0 yr +	1800	14.94	1.51	99.0	4.2	57.3	2.4	52.2	2.1	49.3	1.3	15.2	1.0
	4.5 yr +	1800	15.69	1.62	102.0	4.4	58.7	2.5	52.9	2.1	49.6	1.3	15.2	1.0
	5.0 yr +	1800	16.46	1.67	105.3	4.3	60.0	2.5	53.5	2.1	49.9	1.3	15.2	1.0
5.5 yr +	1800	17.22	1.68	108.1	4.3	61.3	2.6	54.2	2.1	50.1	1.3	15.3	1.0	
6~7 yr	1800	18.34	1.94	111.8	4.8	62.8	2.7	55.2	2.2	50.3	1.3	15.5	1.1	
Girls	0~3 day	1530	3.11	0.34	49.6	1.7	33.2	1.3	32.3	1.3	33.5	1.1	10.3	0.8
	1 mo +	1480	4.67	0.61	55.5	2.5	36.6	1.9	36.6	1.9	37.1	1.4	11.7	1.1
	2 mo +	1480	5.48	0.67	58.4	2.4	38.5	1.8	38.5	1.8	38.6	1.3	12.6	1.1
	3 mo +	1480	6.07	0.70	60.4	2.3	39.6	1.7	39.7	1.8	39.7	1.3	13.0	1.1
	4 mo +	1480	6.59	0.80	62.2	2.4	40.6	1.7	40.6	1.9	40.7	1.3	13.4	1.1
	5 mo +	1470	7.04	0.79	64.0	2.4	41.5	1.8	41.4	1.9	41.5	1.3	13.5	1.1
	6 mo +	1480	7.48	0.88	66.0	2.6	42.5	1.9	42.3	2.0	42.5	1.3	13.7	1.1
	8 mo +	1530	7.89	0.85	68.4	2.6	43.7	1.8	42.9	1.8	43.3	1.3	13.7	1.1
	10 mo +	1530	8.26	0.95	70.8	2.8	44.9	1.9	43.5	2.0	43.9	1.3	13.6	1.1
	12 mo +	1800	8.71	0.98	73.4	3.0	46.0	2.0	44.2	1.9	44.6	1.3	13.7	1.1
	15 mo +	1800	9.22	1.05	76.0	3.0	47.2	2.0	45.1	1.9	45.2	1.3	13.8	1.1
	18 mo +	1800	9.77	1.08	78.5	3.3	48.4	2.1	46.0	1.9	45.7	1.3	14.0	1.1
	21 mo +	1800	10.21	1.07	80.6	3.3	49.5	2.2	46.7	1.9	46.2	1.3	14.1	1.1
	2.0 yr +	1800	10.98	1.17	83.8	3.7	51.1	2.2	47.6	2.0	46.6	1.3	14.4	1.1
	2.5 yr +	1800	11.97	1.23	87.8	3.7	52.7	2.2	48.8	2.0	47.3	1.3	14.7	1.0
	3.0 yr +	1800	12.79	1.33	91.0	4.0	53.8	2.3	49.5	2.0	47.6	1.3	14.9	1.0
	3.5 yr +	1800	13.70	1.40	94.6	4.0	55.2	2.3	50.5	2.0	48.1	1.3	15.0	1.0
	4.0 yr +	1800	14.32	1.51	97.8	4.2	56.5	2.4	50.9	2.1	48.3	1.3	15.0	1.0
	4.5 yr +	1800	15.14	1.56	101.0	4.2	57.8	2.4	51.6	2.1	48.7	1.3	15.2	1.0
	5.0 yr +	1800	15.94	1.71	104.3	4.3	59.3	2.5	52.1	2.1	48.9	1.3	15.2	1.1
5.5 yr +	1800	16.63	1.75	106.9	4.5	60.5	2.5	52.8	2.1	49.2	1.3	15.3	1.0	
6~7 yr	1800	17.92	1.97	111.3	4.9	62.4	2.7	53.9	2.2	49.5	1.3	15.5	1.1	

The trends of increments of average values of these variables were in accordance with the general trend of children's physical growth. The weight and size of children increase with chronological age, and the earlier, the more rapid the increment. For example, in terms of the yearly increments of weight (kg) and height (cm), the urban boys gained 6.4 kg/year in weight and 24.7 cm/year in length, during the first year of life; 2.1 kg/year and 10.7 cm/year during the second year and 1.8 kg/year and 6.9 cm/year over the age range 3-6 years.

The increment of upper arm circumference also showed the same growth pattern of deceleration. At birth to 3 days, the means of upper arm circumference for boys and girls in both the urban and rural areas were very similar, ranging from 10.5 cm (urban boys and girls) to 10.3 cm (rural girls). During the first year, the average increment was about 4 cm. From one year onwards, the increment of upper arm circumference decreased. At the age of 6-7 years old, the means of upper arm circumference ranged from 16.2 cm (urban boys) to 15.5 cm (rural boys and girls) (Figure 1).

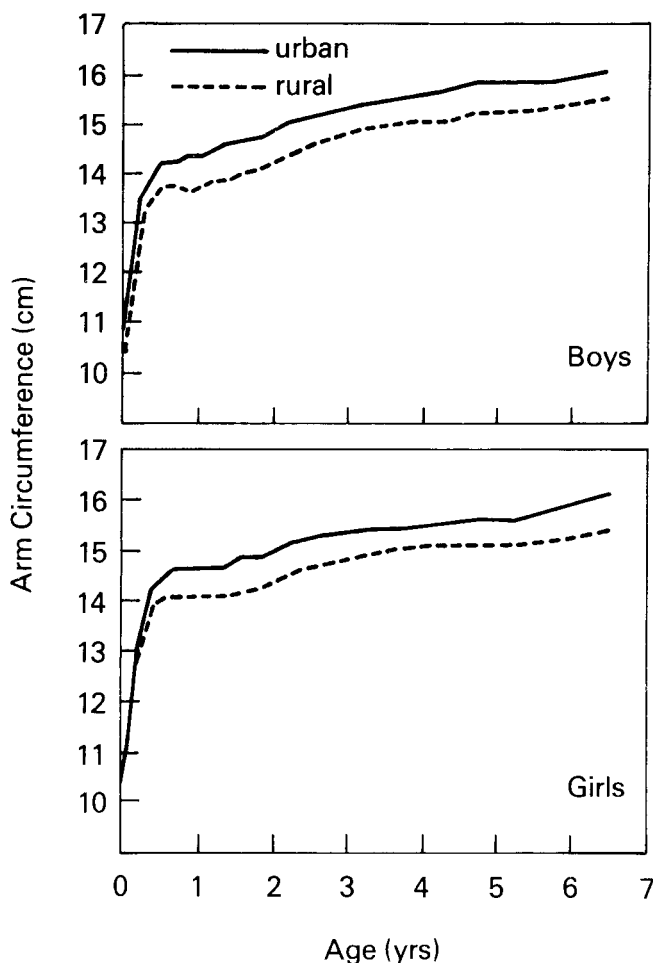


Figure 1. Arm circumference of Chinese children 1985.

#### *Sex/urban-rural/regional differences in growth*

As in 1975, the physical growth and development of children were significantly different not only between boys and girls but also between urban and rural populations and between different parts of the country. There was a tendency for boys to be heavier and taller than girls; urban children and northern children were also heavier and taller than their rural counterparts and their southern peers, respectively.

*Sex difference.* Figure 2 shows that the sex difference in weight and height began at birth, when male infants were heavier and longer than girls by 0.1 kg and 0.6 cm. The difference became larger until in the age group 6–7 years the boys were heavier than girls by 0.7 kg (urban) and 0.4 kg (rural), and the boys were taller than girls by 1.1 cm (urban) and 0.5 cm (rural). These differences are significant and consistent.

*Urban-rural difference.* Figure 3 shows that the urban children in all age groups are taller and heavier than the rural ones of the same sex except for the age group birth–3 days (both for weight and length) and the age group of one month (for weight). The urban-rural difference in growth became larger and larger, especially after

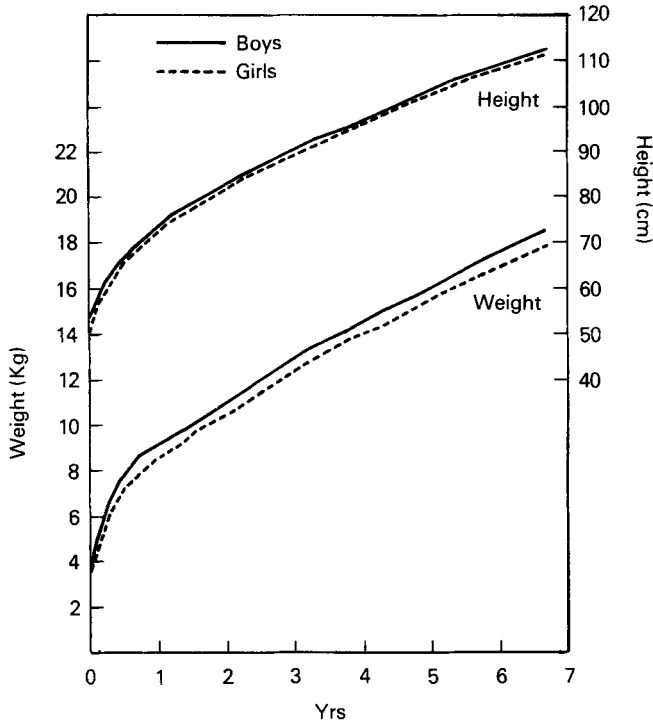


Figure 2. Sex difference in weight and height in Chinese urban children, 1985.

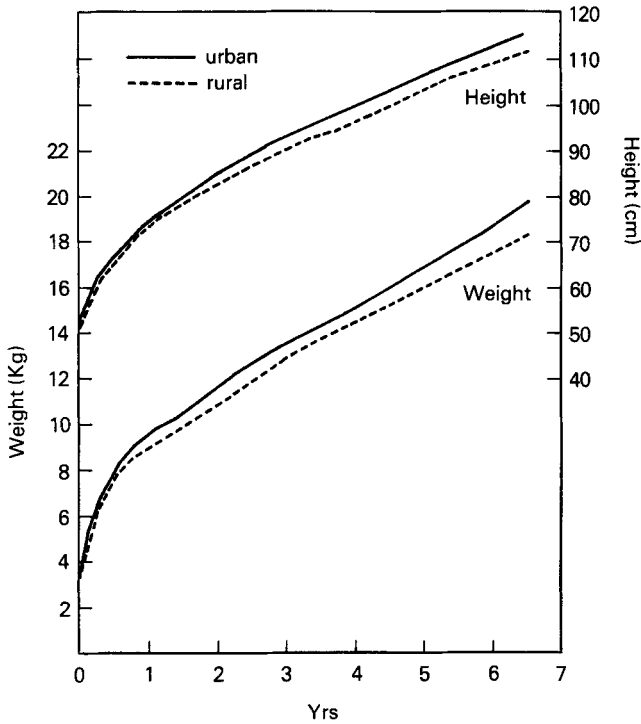


Figure 3. Urban-rural difference in weight and height of Chinese boys, 1985.

6 months. At the age of 6–7 years the urban children are heavier than rural ones by 1.5 kg for boys and 1.2 kg for girls; and are taller by 4.4 cm for boys and 3.8 cm for girls. The urban–rural difference in growth is larger than the sex difference in the present study.

**Regional difference.** The 1985 study shows similar results to the 1975 study, that is the northern children were heavier and taller than the southern children (figure 4). There were no significant differences between the northern and central children in most of the 22 age groups, especially after the age of 4.5 years old. The maximum differences in weight or height among the nine cities were larger than the differences among the three parts of China. Taking the mean height of urban children 6–7 years as an example, the tallest were Beijing boys and girls (118.6 cm and 117.0 cm, respectively); the smallest were Fuzhou boys and girls (113.8 cm, respectively). The greatest height differences between extreme values for boys and girls were 4.8 cm and 4.4 cm.

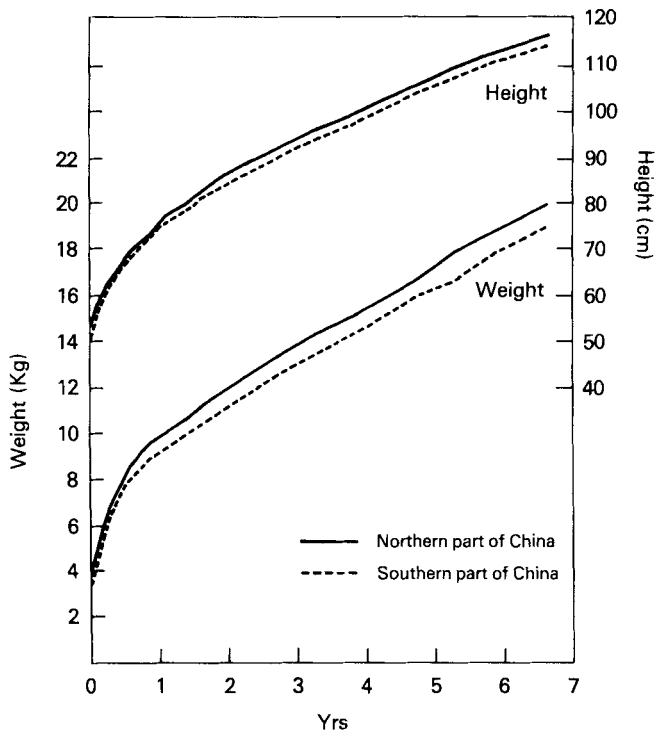


Figure 4. Regional difference in weight and height of Chinese boys, 1985.

#### Comparison with 1975 study

The present survey showed that the physical growth and development of Chinese children of nine cities has been greatly improved compared with the 1975 study. However, unexpectedly, in the age group of birth–3 days and some other young age groups up to 8 months, the ten-year increments of the five somatic parameters were not significant; some were even negative.

**Weight.** The mean weight of boys and girls, in most age groups, from both urban and

rural areas of nine cities increased at different rates compared with that of ten years ago. Table 3 shows that at the age of 6–7 years, the mean weight of urban boys, urban girls, rural boys and rural girls increased by 0.56 kg, 0.41 kg, 0.23 kg and 0.39 kg respectively, the average increment being 0.4 kg. Notably, the urban children of the first 6 months had no significant increase (0.01–0.09 kg), and in the age group from birth to 3 days the infants' weight decreased by 0.04 kg in the 10 years (table 3, figures 5 and 6).

Table 3. Secular changes of five anthropometric variables, 6–7 years, 1975–1985.

Areas	Sex	Weight (Kg)	Length (cm)	Sitting H. (cm)	Chest C. (cm)	Head C. (cm)
Urban	Boys	0.56	1.5	0.2	0.2	0.1
	Girls	0.41	1.2	0.2	-0.1	0.0
Rural	Boys	0.23	2.0	0.5	-0.7	0.1
	Girls	0.39	2.3	0.6	-0.2	0.1
Total	--	0.40	1.8	0.4	-0.2	0.1

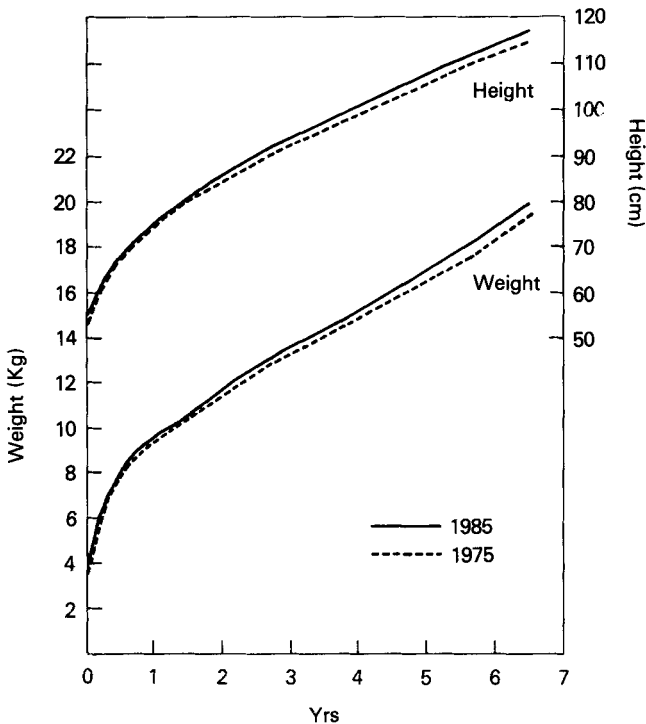


Figure 5. Weight and height of Chinese urban boys, 1975–1985.



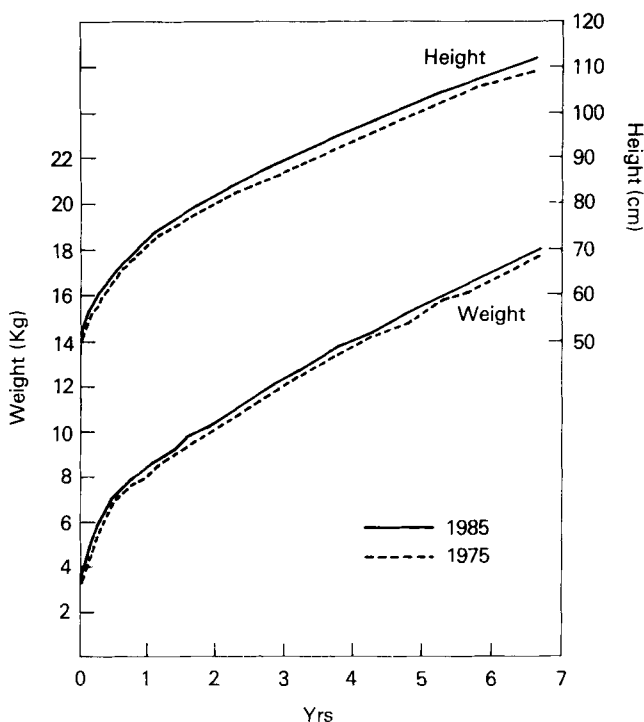


Figure 6. Weight and height of Chinese rural girls 1975-1985.

**Height.** Compared with the corresponding results in 1975, the mean heights in both boys and girls from both the urban and rural areas increased significantly except at birth (for all) and at one month age groups (for urban children). As in weight, the ten-year increments in height were smaller at the younger ages, and became greater at the older ages. At ages 6-7 years, the height increments in the past ten years were: urban boys and girls 1.5 cm and 1.2 cm, rural boys and girls 2.0 cm (figures 5 and 6, table 3). It can be seen that the ten-year height increments of rural boys and girls surpass those of their urban peers.

**Sitting height.** Between 1975-1985, the mean sitting heights increased in rural children (in almost all age groups) and in urban children (between 8 months and 7 years). At ages 6-7, the increments in urban boys and girls were both 0.2 cm while in rural boys and girls they were 0.5 cm and 0.6 cm, (table 3). Thus the rural children have gained more during the past 10 years.

Table 4 shows the secular changes in height, sitting height, sub-ischial leg length (SLL), and sitting height/height index in the urban children; the rural children have the same changes as their urban peers. Clearly the increase of the height between 1975 and 1985 is mainly contributed to by the increase of the SLL, therefore the sitting height/height index decreases significantly. In other words, the proportion of legs to trunk has got greater.

**Chest circumference.** Unlike the above three physical variables, the increases in mean chest circumference were not significant or regular compared with those of the children of the same sex-age-area of ten years ago. The slight increments can be seen only among the urban children after 6 months and the rural children between 5 months and 3 years

Table 4. Secular changes in height, sitting height, SLL and sitting height/weight index in Chinese (urban) children 0-7 years in 1975-1985.

Age Groups	Height (cm)	Sitting Height (cm)	SLL (cm)	Sitting Height/Height $\times 100$
BOYS				
0-3 days	-0.4	-0.2	-0.2	0.1
1-2 mos	0.0	-0.2	0.2	-0.3
6-8 mos	0.5	0.0	0.5	-0.5
12-15 mos	0.9	0.1	0.8	-0.6
2.0-2.5 yrs	1.4	0.6	0.8	-0.3
3.0-3.5 yrs	1.3	0.4	0.9	-0.4
4.0-4.5 yrs	1.3	0.4	0.9	-0.3
5.0-5.5 yrs	1.4	0.4	1.0	-0.4
6.0-7.0 yrs	1.5	0.2	1.3	-0.5
GIRLS				
0-3 days	-0.4	-0.3	-0.1	-0.1
1-2 mos	0.1	-0.2	0.3	-0.5
6-8 mos	0.3	-0.2	0.5	-0.6
12-15 mos	1.0	0.3	0.7	-0.4
2.0-2.5 yrs	1.3	0.5	0.8	-0.3
3.0-3.5 yrs	1.4	0.5	0.9	-0.3
4.0-4.5 yrs	1.1	0.2	0.9	-0.4
5.0-5.5 yrs	1.1	0.2	0.9	-0.4
6.0-7.0 yrs	1.2	0.2	1.0	-0.4

\*SLL is sub-ischial leg length (stature less sitting height).

while most of the remainder had no increase or even decreased slightly. At ages 6-7 years, the ten-year increment of chest circumference was on the average -0.2 cm; in sub-groups, except for the 0.2 cm increment in urban boys; chest circumference of the urban girls, rural boys and girls were decreased by 0.1 cm, 0.7 cm and 0.2 cm, respectively (table 3).

*Head circumference.* Head circumference is the least changed of the five somatic parameters. In the lower age groups (urban children under 8 months, rural boys under 6 months and rural girls under 4 months) there were zero or negative increments of head circumference (0-0.4 cm) and most of the remainder fluctuate from  $\pm 0.1$  cm to  $\pm 0.2$  cm. (table 3).

#### *The change of urban-rural difference in growth (1975-1985)*

Although there were still significant and consistent urban-rural differences in growth in 1985 as in 1975, the differences have become smaller (especially in height, and at some younger ages). In general, the urban and rural children within 2 months after birth have already no differences in weight and height.

*Height.* In almost all age groups the urban-rural difference in height became smaller. Table 5 shows that in the from birth to 3 days age groups, the urban and rural infants have the same length for sex. At ages 6-7 years old, the urban-rural difference in height for boys has decreased from 4.9 cm in 1975 to 4.4 cm in 1985; and for girls, has decreased from 4.9 cm to 3.8 cm.

Table 5. The height difference between the urban and rural children, 1975-1985.

Age Group	Boys		Girls	
	1975	1985	1975	1985
0-3 days	0.4	0.0	0.3	0.0
6-8 mos	1.3	1.1	1.3	1.0
12-15 mos	1.9	1.6	1.8	1.7
2.0-2.5 yrs	2.9	2.5	3.1	2.8
3.0-3.5 yrs	3.3	2.6	3.6	3.2
4.0-4.5 yrs	2.7	3.1	4.2	3.4
5.0-5.5 yrs	3.3	3.3	4.5	3.3
6.0-7.0 yrs	4.9	4.4	4.9	3.8

*Weight.* The tendency for urban-rural difference in weight to decrease is not as obvious as that for height but such a change also exists, especially in boys under 2.5 years and girls less than 4 years old. The differences in birthweights of urban and rural infants were not significant ( $\pm 0.01$  kg); and at one month of age the weights of rural boys and girls even slightly surpassed that of their urban peers, by 0.05-0.07 kg.

#### *Comparison with children from other countries.*

We compared the physical growth parameters of Chinese urban children with those of Japanese and American children. The results show the Chinese urban children are the smallest in weight and height among the three countries (table 6).

Table 6. The comparison of physical growth parameters between Chinese, Japanese and U.S. children 6-7 years.

Measurements	China (1985)	Japan* (1986)	U.S.** (1976-80)
BOYS			
Weight	19.8	21.2	23.0
Height	116.2	116.5	119.5
Sitting Height	64.7	65.3	65.3
Chest Circumference	55.8	57.8	59.3
Head Circumference	50.9	—	51.6
Arm Circumference	16.2	—	18.6
GIRLS			
Weight	19.1	20.8	22.1
Height	115.1	115.8	118.4
Sitting Height	64.0	64.8	64.3
Chest Circumference	54.1	56.4	57.6
Head Circumference	50.0	—	50.7
Arm Circumference	16.0	—	18.5

\*Health and Statistics Association of Japan. 1987, School Health, Indices of Health and Welfare (Supplement), 34 : 18-19.

\*\*The U.S. data in Table 6 are from the NCHS, collected in the Second National Health and Nutrition Examination Survey in 1976-80 (NHANES II).

National Center for Health Statistics: Anthropometric Reference Data and Prevalence of Overweight, United States, 1976-80. Vital and Health Statistics, Series 11, No. 238. DHEW Publication No. (PHS) 87-1688. Public Health Service. Washington. U.S. Government Printing Office, Oct. 1987 p. 17-49.

*Comparison with Japanese children.* China and Japan have much in common, both in ethnic origin and lifestyle although Japan has had a more rapid economic development since the Second World War. Four physical growth measurements were compared between the Chinese and Japanese children. The results show the Chinese urban boys and girls are shorter in stature and sitting height, lighter in weight, and smaller in chest circumference than the corresponding Japanese children. Chinese children are slenderer than their Japanese peers.

*Comparison with American children.* The American children are amongst the largest both in height and weight in the world. The American growth norms of children have been recommended as international reference values by the World Health Organization (WHO 1983). Anthropometric dimensions were compared between the Chinese and the American children. Generally speaking, in the earlier groups, the mean measurements of the Chinese children are comparable to the U.S. values; but soon they fall behind and the differences between the two populations become larger as age progresses.

Table 6 shows that by the age of 6–7 years the physical differences between the two sets of children reaches 3.2 kg in boys and 3.0 kg in girls; 3.3 cm in height, 3.5 cm in chest circumference, and 0.7 cm in head circumference for both boys and girls. Amongst the six anthropometric measurements, sitting height is the one with the least difference between the two populations.

#### *Weight for height*

Figure 7 shows that, at heights between 50 and 73 cm, the curve of the mean weight of Chinese boys parallels those of their U.S. peers, the weight differences fluctuating within  $\pm 0.2$  kg. At heights greater than 73 cm, the weights of Chinese boys become gradually less than those of the U.S. ones of the same height. The difference in weight became larger as the height increased, and by the height of 125 cm. The Chinese boys were lighter by 1.2 kg than the U.S. boys at the same height.

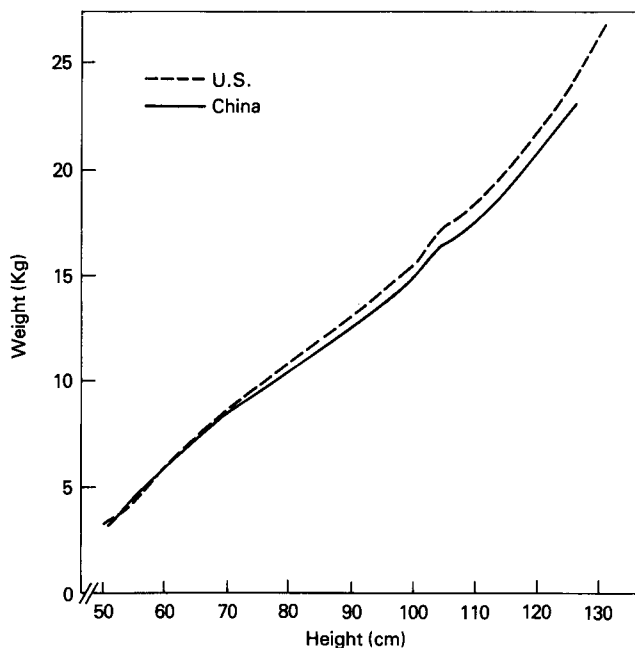


Figure 7. Comparison of mean weight for height between Chinese (urban) and U.S. boys.

#### 4. Discussion

##### *The changes and the characteristics in growth of the Chinese children in 1975–1985*

When studying child growth we cannot ignore the effects of the social environment. During the ten years 1975 to 1985, many changes took place in continental China. Generally speaking, it was an important historical period, of change from a disturbed society with economic standstill to a stable society with rapid economic development. In this period, along with the national economic development and reform, the Chinese government has been carrying out the 'one-child policy' (that is a couple are encouraged to have only one child) in order to control and decrease the natural growth rate of the population. As the result single-child rates have reached above 95 % in big cities of China. Undoubtedly, all of these remarkable changes in socio-economics, living standards and living styles have deeply influenced the lives of thousands of Chinese households both in cities and in rural areas, and hence affected the growth and development of children, because it is well known that socio-economic status, family and nutrition are among the most important environmental factors affecting child growth. (Tanner 1987).

In the present study, all the children were born between 1978 and 1985. By comparing the two national cross-sectional growth surveys a decade apart the following changes and characteristics in child growth in China can be observed:

(1) From birth to 3 days: The means of 5 physical measurements (weight, length, sitting height, chest circumference and head circumference) did not increase or even decreased compared with those of the babies born ten years ago of the same sex and area. These decrements are not very great numerically, but they are statistically significant. These unexpected findings are probably due to the higher percentage of first-born babies in the 1985 subjects than in subjects in 1975. There is a tendency for the birthweight of the first-born babies to be less than their later-born siblings (Miyamoto, Nakamura and Miura 1986). Other causes for such decrement and their smaller physiques warrant further study.

(2) Between one month and 6·99 years: there were significant increases in weight and status in the majority of age groups between 1 month and 6·99 years except in the earlier age groups. Similar increases can be seen in the weight: height ratio (weight/height) consistently in children in most of the age groups except some who had a comparatively larger height increment and smaller weight increment (e.g. in the 6–7 year-old rural boys, the 10-year increment is 2 cm in height and only 0·23 kg in weight).

In this comparative study, both the single measurements (weight or height) and the relative weight-height ratio increase, indicating that the nutritional status of the present Chinese children is better than it was in those before 1975.

(3) Urban–rural difference in child growth: there are some noticeable changes in the comparative growth of urban and rural children. Although the urban–rural differences in growth still exist, the urban children being taller and heavier than their rural peers, the urban–rural difference in status has become consistently smaller.

(4) The changes in body build of Chinese children: the five physical measurements are not all increased proportionally. While the weight and height (especially the latter) have very significant increases, sitting height and chest circumference are only slightly increased and only in some age groups. Hence there is a noticeable change in the Chinese children's body build, that is Chinese children are more slender than those of the same age-sex-area ten years ago. The present Chinese children have a relatively smaller chest circumference and longer legs than their peers ten years ago.

Because all of these changes were also found in the 7–18-year-old Chinese children in the same nine cities between 1975 and 1985, (Zhang and Huang, in press) we cannot explain these findings simply by earlier maturation.

There is a general conception that far-eastern peoples such as the Chinese and the Japanese have considerably shorter legs than the Europeans and Africans. But this is seemingly not unchangeable. Some years ago, Tanner and colleagues observed that the secular trend in Japanese children is almost entirely one of legs and they quoted some other but rather sparse data from the rest of the world which makes one think that this is a universal phenomenon (Tanner, Hayashi, Preece and Cameron 1982).

The findings of this study show exactly the same thing in respect of the Chinese secular trend; although in Chinese children there is a small increase in sitting height, it is very much less than the increase in leg length. Thus the proportion of legs to trunk has got greater in Chinese children, that is, has moved in the direction of the European proportion and away from the traditional concept (Tanner 1987).

It is not very clear what causes the change in body proportion and how long the change will last: perhaps we can get the result in the following national surveys.

### *Secular change*

A remarkable secular trend in stature can be seen in the Chinese children. Tracing back to the time before 1975, although there were no representative Chinese child growth data countrywide for comparison, the consistent accelerated growth trend can be seen in some local areas with relatively well-documented growth data, for example, in the cities of Beijing, Nanjing and Shanghai. Taking the example of Beijing urban boys, 6–7 years of age, the average height increased from 113·1 cm in 1937 to 118·6 cm in 1985, the increment being 5·5 cm during the first 48 years, 1·1 cm per 10 years and 1·2 cm for the last decade. This marked secular change can be observed not only in the Beijing preschool children but also in the Beijing adolescents and adults. Beijing children and adults are the tallest in the country. The secular change in Beijing subpopulation may represent in some degree that in Chinese children, which may have been partly caused by the improvement of nutritional status and living conditions due to economic development.

### *Acknowledgement*

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Address for correspondence: Dr Xuan Zhang, Capital Institute of Paediatrics, 1 Yue-Tan South Street, Beijing, 100045, People's Republic of China.

**Zusammenfassung.** Zur Einschätzung des normalen Körperwachstums und der Entwicklung chinesischer Kinder und zum Vergleich des Ernährungsstatus von heute mit demjenigen vor 10 Jahren wurde 1985 eine zweite nationale Querschnitt-Wachstumuntersuchung in denselben städtischen und vorstädtischen ländlichen Gegenden von neun Hauptstädten in China wie 1975 durchgeführt. In dieser Untersuchung wurden 152 874 Knaben und Mädchen von der Geburt bis zum Alter 7,0 Jahre bezüglich Gewicht, Körperhöhe, Sitzhöhe, und Brust- und Oberarmumfang gemessen. Verglichen mit den Ergebnissen von 1975 hat sich der Wachstums- und Entwicklungszustand für Knaben wie für Mädchen in städtischen wie in vorstädtischen und ländlichen Gegenden relativ gesehen sehr verbessert. Die Durchschnitte von Gewicht und Körperhöhe haben in den vergangenen 10 Jahren um 0,40 kg und 1,8 cm bei 6 bis 7 Jahre alten Kindern zugenommen. Der größere Teil der Höhenzunahme erklärt sich durch eine Zunahme der Beinlänge. Der Stadt-Land-Unterschied der Körperhöhe ist kleiner geworden, da die Zunahme in ländlichen Gebieten größer war. Die Daten dieser Untersuchung können als neuer Wachstumsstandard für chinesische Kinder benutzt werden.

**Résumé.** Dans le but d'évaluer la croissance et le développement normaux des enfants chinois et afin de comparer leur statut nutritionnel actuel avec celui qu'ils présentaient il y a dix ans, une seconde enquête transversale de croissance à l'échelle nationale, a été entreprise dans les mêmes zones urbaines et suburbaines de neuf principales villes de Chine, en 1985 qu'en 1975. 152 874 garçons et filles ont été mesurés pour le poids, la stature, la taille-assis et les circonférences de la poitrine, de la tête et du bras, depuis la naissance jusqu'à l'âge de 7 ans. En comparaison des résultats de 1975, il apparaît que les conditions de croissance et de développement des enfants, garçons ou filles des zones urbaines et suburbaines, se sont fortement améliorées. Chez les enfants de 6–7 ans, les moyennes du poids et de la stature se sont respectivement accrues de 0,40 Kg et 1,8 cm en dix ans. La différence staturale entre urbains et ruraux a diminué par suite de la plus grande augmentation de stature en secteur rural. Les données de cette enquête peuvent être utilisées comme standards de croissance pour les enfants chinois.

## Appendix

*The data of the first national growth survey of Chinese children 0–18 years in 1975.*

1975 growth data have been published in a Chinese journal (Institute of Paediatrics of CAMS 1977a) and has been used as a national growth standard for Chinese children. (tables 7–10).

Table 7. Measurements of Chinese urban boys 0-18 years, 1975.

Age	No.	Weight		Height		Sitting H.		Chest C.		Head C.	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
0-3 day	2052	3.27	0.36	50.6	1.87	33.7	1.58	32.8	1.52	34.3	1.29
1 mo +	1992	4.97	0.67	56.5	2.42	37.7	1.91	37.9	2.03	38.1	1.30
2 mo +	1976	5.95	0.76	59.6	2.56	39.7	2.05	40.0	2.07	39.7	1.30
3 mo +	2037	6.73	0.79	62.3	2.53	41.2	1.98	41.3	2.06	41.0	1.25
4 mo +	2070	7.32	0.85	64.4	2.47	42.3	1.95	42.3	2.10	42.0	1.29
5 mo +	2026	7.70	0.88	65.9	2.61	43.1	1.95	42.9	2.23	42.9	1.37
6 mo +	2210	8.22	0.96	68.1	2.65	44.1	1.90	43.8	2.12	43.9	1.35
8 mo +	2117	8.71	0.99	70.6	2.70	45.2	1.98	44.7	2.12	44.9	1.32
10 mo +	2045	9.14	1.03	72.9	2.81	46.3	2.13	45.4	2.16	45.7	1.36
12 mo +	2169	9.66	1.08	75.6	3.06	47.8	2.08	46.1	2.59	46.3	1.39
15 mo +	2062	10.15	1.11	78.3	3.22	49.0	2.27	46.8	2.02	46.8	1.38
18 mo +	2097	10.67	1.19	80.7	3.28	50.1	2.14	47.6	2.13	47.3	1.30
21 mo +	2149	11.18	1.23	83.0	3.55	51.2	2.30	48.3	2.24	47.8	1.34
2.0 yr +	2387	11.95	1.27	86.5	3.76	52.7	2.31	49.2	2.13	48.2	1.37
2.5 yr +	2421	12.84	1.35	90.4	3.80	54.4	2.40	50.2	2.12	48.8	1.38
3.0 yr +	2209	13.63	1.42	93.8	3.97	55.5	2.59	50.8	2.15	49.1	1.36
3.5 yr +	2301	14.45	1.52	97.2	4.29	56.9	2.53	51.5	2.08	49.4	1.36
4.0 yr +	2241	15.28	1.56	100.8	4.49	58.3	2.55	52.2	2.09	49.7	1.36
4.5 yr +	2298	16.07	1.69	103.9	4.46	59.7	2.64	53.0	2.13	50.0	1.34
5.0 yr +	2182	16.88	1.84	107.2	4.55	61.1	2.67	53.6	2.21	50.2	1.31
5.5 yr +	2223	17.65	1.86	110.1	4.62	62.2	2.52	54.4	2.24	50.5	1.28
6.0 yr +	2580	19.25	2.10	114.7	4.85	64.5	2.67	55.6	2.39	50.8	1.34
7.0 yr +	2292	21.01	2.44	120.6	5.22	66.6	2.96	57.1	2.59	51.1	1.36
8.0 yr +	1965	23.08	2.81	125.3	5.48	68.7	2.89	58.8	2.83	51.4	1.31
9.0 yr +	2010	25.33	2.98	130.6	5.60	70.7	2.90	60.8	2.93	51.7	1.30
10 yr +	2042	27.15	3.54	134.4	5.86	72.3	2.93	62.0	3.14	51.9	1.36
11 yr +	2233	30.13	3.96	139.2	6.08	74.4	3.04	63.3	3.40	52.3	1.40
12 yr +	2451	33.05	4.52	144.2	6.64	76.7	3.44	66.5	3.62	52.7	1.47
13 yr +	2084	36.90	5.89	149.8	7.98	79.5	4.23	68.9	4.51	53.0	1.54
14 yr +	1966	42.03	6.55	156.5	8.00	83.0	4.66	72.4	4.95	53.5	1.67
15 yr +	2177	46.91	6.46	162.0	7.42	86.3	4.24	76.0	4.92	54.3	1.65
16 yr +	1942	50.90	5.94	168.6	6.30	88.8	3.71	78.8	4.57	54.9	1.63
17-18 yr	1920	53.17	5.76	167.7	6.10	90.3	3.47	80.8	4.44	55.2	1.59

Table 8. Measurements of Chinese urban girls 0-18 years, 1975.

Age	No.	Weight		Height		Sitting H.		Chest C.		Head C.	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
0-3 day	2001	3.17	0.36	50.0	1.80	33.4	1.36	32.6	1.42	33.7	1.26
1 mo +	1940	4.64	0.54	55.5	2.36	36.9	1.90	36.9	1.95	37.3	1.28
2 mo +	1901	5.49	0.69	58.4	2.50	38.7	2.06	38.9	2.08	38.7	1.25
3 mo +	1985	6.23	0.75	60.9	2.43	40.1	1.91	40.3	2.06	40.0	1.27
4 mo +	1938	6.89	0.79	62.9	2.41	41.2	1.91	41.1	2.03	41.0	1.28
5 mo +	1994	7.19	0.84	64.5	2.46	42.1	1.85	41.9	2.05	41.9	1.27
6 mo +	2202	7.62	0.89	66.7	2.78	43.2	2.03	42.7	2.10	42.8	1.30
8 mo +	2090	8.14	0.95	69.0	2.76	44.1	1.89	43.4	2.13	43.7	1.31
10 mo +	2072	8.57	0.97	71.4	2.67	45.4	1.98	44.2	2.08	44.5	1.31
12 mo +	2053	9.04	1.02	74.1	2.95	46.6	2.11	45.0	2.01	45.2	1.36
15 mo +	2029	9.54	1.10	76.9	3.16	48.0	2.25	45.8	2.07	45.6	1.39
18 mo +	2029	10.08	1.13	79.4	3.36	49.4	2.32	46.6	2.13	46.2	1.29
21 mo +	2083	10.56	1.15	81.7	3.50	50.4	2.30	47.3	2.15	46.7	1.35
2.0 yr +	2247	11.37	1.21	85.3	3.53	51.9	2.33	48.2	2.15	47.1	1.35
2.5 yr +	2286	12.28	1.33	89.3	3.89	53.6	2.44	49.0	2.13	47.7	1.33
3.0 yr +	2190	13.16	1.37	92.8	3.90	54.7	2.47	49.8	2.08	48.1	1.31
3.5 yr +	2238	14.00	1.51	96.3	4.11	56.1	2.46	50.5	2.04	48.5	1.30
4.0 yr +	2202	14.89	1.54	100.1	4.34	57.8	2.47	51.2	2.12	48.9	1.37
4.5 yr +	2244	15.63	1.60	103.1	4.36	59.1	2.50	51.8	2.24	49.1	1.29
5.0 yr +	2237	16.46	1.69	106.5	4.39	60.4	2.51	52.5	2.11	49.4	1.36
5.5 yr +	2151	17.18	1.77	109.2	4.50	61.8	2.53	53.0	2.11	49.6	1.39
6.0 yr +	2540	18.67	2.03	113.9	4.91	63.8	2.69	54.2	2.30	50.0	1.38
7.0 yr +	2240	20.35	2.40	119.3	5.34	65.8	2.90	55.5	2.51	50.2	1.24
8.0 yr +	1946	22.43	2.73	124.6	5.48	68.2	2.92	57.1	2.73	50.6	1.41
9.0 yr +	1946	24.57	3.02	129.5	5.42	70.2	2.94	58.6	2.97	50.9	1.49
10 yr +	1984	27.05	3.66	134.8	6.36	72.5	3.21	60.7	3.43	51.3	1.50
11 yr +	2115	30.51	4.55	140.6	6.60	75.3	3.57	63.5	4.33	51.7	1.62
12 yr +	2383	34.74	5.37	146.6	6.76	78.4	3.78	67.2	4.76	52.3	1.67
13 yr +	2042	38.52	5.79	150.7	6.34	80.7	3.69	70.3	5.06	52.8	1.66
14 yr +	1939	42.26	5.49	153.7	5.46	82.6	3.38	73.3	5.02	53.1	1.71
15 yr +	2151	45.37	5.59	155.5	5.56	84.1	3.12	75.6	5.02	53.4	1.73
16 yr +	1972	47.43	5.45	156.8	5.46	85.0	2.95	76.6	4.94	53.8	1.72
17-18 yr	1943	48.57	5.37	157.4	5.38	85.5	2.85	77.9	4.83	53.9	1.65



Table 9. Measurements of Chinese rural boys 0-18 years, 1975.

Age	No.	Weight		Height		Sitting H.		Chest C.		Head C.	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
0-3 day	1668	3.22	0.38	50.2	1.71	33.5	1.89	32.7	1.78	34.1	1.44
1 mo +	1794	4.92	0.70	56.1	2.77	37.1	2.28	37.5	2.02	37.9	1.41
2 mo +	1767	5.79	0.77	58.8	2.75	39.0	2.20	39.5	2.10	39.5	1.35
3 mo +	1833	6.49	0.87	61.5	2.73	40.5	2.15	40.9	2.13	40.8	1.35
4 mo +	1795	7.01	0.89	63.3	2.64	41.5	2.17	41.7	2.17	41.7	1.39
5 mo +	1818	7.41	0.94	65.0	2.69	42.4	2.04	42.3	2.16	42.6	1.39
6 mo +	1948	7.79	0.92	66.8	2.70	43.3	1.92	43.0	2.13	43.5	1.40
8 mo +	1961	8.19	0.93	69.1	2.78	44.5	2.05	43.8	2.12	44.5	1.39
10 mo +	1987	8.59	0.95	71.3	2.62	45.4	2.16	44.4	2.17	45.2	1.38
12 mo +	2064	8.97	1.15	73.7	3.14	46.6	2.28	45.1	2.16	45.8	1.38
15 mo +	1957	9.45	1.06	76.2	3.04	47.7	2.24	45.8	2.11	46.3	1.33
18 mo +	2124	9.96	1.12	78.3	3.53	48.7	2.35	46.8	2.17	46.8	1.46
21 mo +	2189	10.36	1.13	80.8	3.38	49.8	2.34	47.6	2.13	47.3	1.37
2.0 yr +	2167	11.28	1.25	83.6	3.71	51.3	2.45	48.5	2.24	47.6	1.45
2.5 yr +	2370	12.27	1.34	87.3	3.96	53.0	2.65	49.7	2.24	48.3	1.45
3.0 yr +	2203	13.11	1.42	90.5	4.30	54.1	2.66	50.8	2.32	48.6	1.41
3.5 yr +	2391	13.86	1.48	93.4	4.21	55.3	2.69	51.6	2.21	49.0	1.44
4.0 yr +	2247	14.61	1.50	97.1	4.47	56.9	2.83	52.3	2.21	49.1	1.42
4.5 yr +	2337	15.29	1.60	99.7	4.70	57.9	2.73	53.0	2.17	49.4	1.39
5.0 yr +	2249	16.08	1.63	103.9	4.68	59.4	2.73	53.6	2.23	49.6	1.40
5.5 yr +	2102	16.81	1.72	105.7	4.77	60.4	2.77	54.2	2.23	50.0	1.41
6.0 yr +	2362	18.11	1.91	109.8	4.94	62.3	2.81	55.9	2.44	50.2	1.51
7.0 yr +	2235	19.81	2.17	115.2	5.20	64.7	2.80	58.0	3.19	50.7	1.51
8.0 yr +	2011	21.77	2.44	120.3	5.42	66.6	2.88	58.8	2.69	51.0	1.52
9.0 yr +	2081	23.81	2.66	125.3	5.52	68.7	2.91	60.7	2.75	51.4	1.48
10 yr +	2106	25.95	2.99	129.7	5.56	70.6	2.95	62.2	2.82	51.7	1.41
11 yr +	2128	28.07	3.39	133.7	5.94	72.2	3.02	63.8	3.03	51.9	1.49
12 yr +	2236	30.84	4.04	138.6	6.32	74.3	3.25	65.7	3.30	52.2	1.54
13 yr +	1952	33.89	4.95	143.9	7.46	76.5	3.81	67.9	3.81	52.4	1.54
14 yr +	1950	38.54	6.12	150.3	8.28	79.6	4.39	71.0	4.55	53.0	1.59
15 yr +	2124	43.64	6.43	156.5	7.64	83.1	4.36	74.6	4.57	53.6	1.63
16 yr +	2042	47.93	6.49	161.0	7.18	85.9	4.19	77.6	4.50	54.2	1.59
17-18 yr	2016	50.68	5.89	163.5	6.22	87.5	3.58	79.6	4.22	54.5	1.59

Table 10. Measurements of Chinese rural girls 0-18 years, 1975.

Age	No.	Weight		Height		Sitting H.		Chest C.		Head C.	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
0-3 day	1604	3.15	0.37 *	49.7	2.20	33.1	1.96	32.4	1.66	33.6	1.38
1 mo +	1738	4.35	0.65	55.0	2.75	36.4	2.26	36.7	2.08	37.1	1.39
2 mo +	1650	5.37	0.70	57.7	2.66	38.1	2.16	38.5	1.98	38.5	1.32
3 mo +	1722	6.01	0.79	60.1	2.59	39.5	2.00	39.7	1.96	39.7	1.26
4 mo +	1692	6.45	0.83	61.9	2.65	40.4	2.06	40.6	2.06	40.6	1.36
5 mo +	1719	6.87	0.82	63.6	2.55	41.3	2.02	41.2	2.09	41.4	1.29
6 mo +	1954	7.24	0.86	65.4	2.70	42.3	2.06	41.9	2.09	42.4	1.37
8 mo +	1903	7.67	0.87	67.7	2.71	43.3	1.99	42.6	2.03	43.4	1.34
10 mo +	1837	7.93	0.89	69.7	2.81	44.4	1.98	43.2	2.05	44.0	1.38
12 mo +	2080	8.43	0.98	72.3	3.17	45.6	2.17	44.0	2.11	44.6	1.37
15 mo +	1997	8.90	0.99	74.7	3.06	46.7	2.22	44.8	2.08	45.2	1.39
18 mo +	1988	9.37	1.10	76.7	3.54	47.7	2.43	45.6	2.15	45.6	1.39
21 mo +	2055	9.94	1.13	78.9	3.67	48.8	2.37	46.5	2.20	46.1	1.33
2.0 yr +	2132	10.66	1.22	82.2	3.74	50.5	2.44	47.4	2.21	46.5	1.37
2.5 yr +	2149	11.67	1.36	85.9	3.98	51.9	2.55	48.6	2.22	47.2	1.41
3.0 yr +	2020	12.48	1.45	89.2	4.17	53.1	2.63	49.6	2.23	47.5	1.44
3.5 yr +	2129	13.31	1.49	92.4	4.34	54.5	2.68	50.4	2.20	48.0	1.39
4.0 yr +	2027	14.15	1.50	95.9	4.45	56.1	2.62	51.1	2.12	48.2	1.41
4.5 yr +	2150	14.77	1.55	98.7	4.49	57.2	2.66	51.7	2.11	48.5	1.43
5.0 yr +	2191	15.56	1.60	102.0	4.50	58.6	2.67	52.3	2.16	48.7	1.43
5.5 yr +	2137	16.20	1.72	105.0	5.05	60.0	2.73	53.0	2.23	49.1	1.39
6.0 yr +	2284	17.53	1.89	109.0	5.17	61.8	2.85	54.1	2.26	49.4	1.45
7.0 yr +	2255	19.16	2.20	114.3	5.24	64.0	2.77	55.5	2.55	49.9	1.55
8.0 yr +	1948	21.08	2.49	119.6	5.36	66.3	2.80	57.1	2.58	50.3	1.46
9.0 yr +	1978	23.07	2.68	124.1	5.60	68.4	3.00	58.8	2.60	50.7	1.51
10 yr +	2079	25.35	3.15	129.2	6.00	70.4	3.13	60.7	2.92	51.1	1.51
11 yr +	2014	28.09	3.91	134.4	6.50	72.7	3.37	62.8	3.48	51.5	1.60
12 yr +	2049	31.86	4.84	140.4	6.94	75.5	3.71	65.8	4.10	51.9	1.58
13 yr +	1907	35.80	5.37	145.7	6.72	78.1	3.72	68.9	4.59	52.4	1.59
14 yr +	1906	39.73	5.58	150.1	6.28	80.5	3.53	72.2	4.78	52.7	1.58
15 yr +	2095	43.83	5.50	153.0	5.62	82.4	3.11	75.8	4.69	53.1	1.70
16 yr +	2036	46.40	5.45	154.3	5.32	83.5	2.93	77.3	4.49	53.4	1.59
17-18 yr	1867	48.00	5.44	154.8	5.40	83.9	3.15	78.6	4.49	53.5	1.54