

Why are children in Hong Kong distinctly shorter in height than those in Beijing, China?

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Received: November 04, 2023

Published: April 15, 2024

Preface

For the past few years, the author has examined the height development of children in Japan in comparison with those in South Korea and China in the North-Eastern part of Asia. Despite a lasting stagnation of the macro-economy in the 1990s and 2000s, Japan was still much greater in respect of per capita GDP than South Korea and China. Children in Japan were overtaken in mean height by 3-4 cm by their peers in South Korea and China in the mid-2000s. With respect to per capita consumption of animal protein, Japan was distinctly greater than South Korea and China then. Have Japanese children depleted their “gene-potential” in height in the 1990s [1]? The author declined to accept this hypothesis [2].

A half century ago, the author was working on the marketing of fruit and vegetables, apples and mandarins, in particular. He would visit the northern prefectures of Japan for apples and southern prefectures for mandarins, and conceived the general picture that people in the North were lighter in complexion and taller in height than those in the South. However, when referring to School Health Examination Surveys, conducted by Ministry of Education in all prefectures every year [3], no differences in mean height of school children by grades are observed by latitude in recent periods in Japan (Table 1).

Questions

We would often hear that people are diverse in China: northerners are taller than southerners and urban residents are taller than rural people. It was only a few months ago that the author came across the statistics that there do exist huge disparities in average height between provinces in recent years [4]. In respect of mean height of male youth, Beijing is 175.3 cm and Guangdong in southern China was 169.8 cm, respectively in 2015. In the case of female youth, Beijing was 167.3 cm and Guangdong was 159.8 cm, respectively. Regarding ethnic compositions, both Beijing and Guangdong are predominantly Han areas: Han occupies 97% and 99% of the two districts (Table 2).

China suffered from the Great Famine in the end of the 1950s caused by the Great Leap Forward [5]. China’s per capita food supply was meager at 1,500 kcal/day in the beginning of the 1960s and slightly close to 2,000 kcal in the beginning of the 1970s, substantially less than Japan and South Korea, 2,700 and 2,800 kcal, respectively [6]. R.H. Steckel stated in Jr. Econ. Literature, 1995 that stature is a net measure that captures the supply of inputs to health [7]. In regard to caloric intake, it is unlikely that people in the entire country of China could have been taller in mean height than either Japanese or

Table 1: Average height of high school senior boys.

location, Japan	Prefecture	(cm)			
		2015		2020	
		Mean	SD	Mean	SD
	All Nation	170.7	5.78	170.7	5.86
	Hokkaido	171.2	5.70	170.8	6.20
	Aomoti	171.3	5.77	170.7	5.68
	Iwate	170.7	6.01	170.8	5.60
	Tokyo	171.0	5.50	171.5	5.87
	Kanagawa	171.0	5.83	171.1	5.87
	Kyouto	171.1	5.72	172.0	5.94
	Osaka	170.9	5.52	170.5	5.77
	Ehime	169.9	5.78	169.4	5.64
	Kumamoto	170.7	5.89	170.6	5.41
	Kagoshima	170.3	6.33	169.9	6.01

Sources: School Health Examination Surveys.

Table 2: Mean Height of Youths by Provinces, China, 2015, upload. Wikimedia.org

- 1: Shandong - Province Capital City ♦ male 175.44cm, female 169.45cm; Han- 99.3%
- 2: Beijing ♦ male 175.32cm, female 167.33cm; Han - 96%
- 3: Liaoning – Province Capital City ♦ male 175.24cm, Female 165.25cm; Han- 84% Manchu-13%
- 4: Heilongjiang – Harbin Cty ♦ Male 175.24cm, Female 165.25cm; Han- 95%(Han) Manchu-3%
- 5: Nei Menggu- Hohhot ♦ Male 174.58cm, Female 164.58cm; Han - 79% Mongol-17%
- 6: Hebei - Shijiazhuang ♦ Male 174.49cm, Female 164.50cm; Han - 96% Manchu-3%
- 7: Ningxia - Yinchuan ♦ Male 173.98cm, Female 163.96cm; Han - 79% Hun - 20%
- 8: Shanghai ♦ Male 173.78cm, Female 163.79cm
- 9: Jilin - Changchun ♦ Male 172.83cm, Female 162.84cm; Han- 91% Korean- 4% Manchu-4%
- 10: Tenshin ♦ male 172.80cm, Female 162.80cm
- 11: Shanxi - Taiyuan ♦ Male 172.73cm, Female 162.74cm
- 12: Shanxi - Xian ♦ Male 172.72cm, Female 161.80cm; Han - 99.5%
- 13: Macao ♦ male 171.79cm, Female 161.79cm
- 14: Gansu - Lanzhou ♦ Male 171.67cm, Female 159.66cm; Han- 91% Un- 5% Tibet-2%
- 15: Jiangsu - Nanjing ♦ Male 171.54cm, Female 161.54cm; Han - 99.6%
- 16: Henan – Zhengzhou ♦ Male 171.49cm, Female 161.47cm; Han - 98.8%
- 17: Qinghai – Province Capital ♦ Male 170.95cm, Female 160.86cm; Han- 54% Tibet- 23% Hun- 16%
- 18: Anhui - Heitel ♦ Male 170.93 Female 160.90; Han- 99%
- 19: Fujian - Fuzhou ♦ Male 170.90cm, Female 160.89cm; Han - 98%
- 20: Zhejiang - Hangzhou ♦ Male 170.90cm, Female 160.88cm; Han - 99.14%
- 21: Hong Kong ♦ Male 170.89cm, Female 160.93cm; Han- 92%
- 22: Sichuan - Chengdu ♦ Male 170.86cm, Female 160.86cm; Han - 95% Tibet-1.5%
- 23: Guangdong - Guangzhou ♦ Male 169.78cm, Female 159.78cm; Han - 99%
- 24: Chongqing ♦ Male 169.71cm, Female 159.71cm
- 25: Jiangxi - Nanchang ♦ Male 169.63cm, Female 159.53cm; Han - 99.7%
- 26: Haikou ♦ Male 169.60cm, Female 159.56cm; Han - 82.6% Lee - 15.84%
- 27: Hubei - Wuhan ♦ Male 169.54cm, Female 159.56cm; Han-95.6% Touch-3.7%
- 28: Guizhou - Guiyang ♦ Male 169.35cm, Female 159.36cm; Han- 62%, Miyao- 12%, Pui-8%, Toucha-4%
- 29: Yunnan - Kunming ♦ Male 169.24cm, Female 159.33cm; Han - 67%, Iee-11%, Pei-3.6%, Thei-2.7%
- 30: Hunan - Changsha ♦ Male 168.99cm, Female 159.10cm; Han - 90%, toucha-4%, Miyao-3%
- 31: Guangxi - Nanning ♦ Male 168.96cm, Female 159.00cm; Han: 62%, Minority races, 38%

Table 3: Changes in per capita GDP, HK, CN, Japan.

South Korean in US \$	(in 2015 prices)			
	HK	CN	JP	KR
1975	8698	326	16276	2909
1985	16036	654	22742	5964
1995	25399	1503	30238	13273
2005	31831	3414	33050	21403
2015	41807	7943	34843	28784

Source: FAOSTAT, macro economic indicator.

Note: year denotes 3 year moving averages.

South Korean peers in these years. Yet that is what the available data show (refer to Tables 3 and 4).

The Ministry of Education, the Government of China initiated nationwide surveys of school children’s stature by age in 1985 and has conducted the surveys every 5 years (Chinese National Survey of Students’ Constitution and Health: CNSSCH) [8]. In view of the fact that the mean height of children should vary by locality as observed above (Table 2), the author is somewhat suspicious about the validity of the national average statistics (China is as large as Europe from north to south and west to east).

Looking for secular changes in mean height by specified localities, the author came across the data for Hong Kong, which looked plausible [9]. Hong Kong, predominantly Chinese in population, was returned to China from Great Britain in 1997. In respect of per capita GDP, HK was nearly 10 times as big as

Table 4: Changes in per capita supply of meat+fish, vegetables and fruit, HK, CN, JP and KR, 1962 to 2010.

	(kg/year)			
	HK	CN	JP	KR
	Meat+Fish			
1962	74.7	8.8	60.4	17.9
1970	113.6	12.8	78.9	26.3
1980	128.5	17.7	96.2	56.9
1990	160.7	34.3	109.3	71.6
2000	180.5	67.0	112.7	98.1
2010	219.1	89.1	100.4	118.5
	Vegetables			
1962	53.9	72.5	108.1	74.9
1970	84.6	50.0	129.4	106.6
1980	90.3	51.9	123.3	206.4
1990	69.3	99.2	117.2	196.1
2000	86.9	232.7	112.7	229.6
2010	103.0	330.7	100.3	212.0
	Fruit			
1962	34.7	3.8	31.4	5.9
1970	65.4	4.0	52.6	12.1
1980	73.8	6.3	56.8	24.6
1990	75.6	14.8	49.8	52.8
2000	87.2	43.3	52.7	68.8
2010	77.7	78.1	50.9	69.2

Sources: FAOSTAT, FBS, old methodology.

Note: year denotes 3 year moving averages.

mainland China, as a whole in 2000 and even in the mid-2010s HK was more than 5 times as big as mainland (Table 3). As of 2015, HK was not among the China’s tallest provinces in respect of mean height of residents, either male or female. In terms of average height of residents (youth), male and female, Hong Kong, were 170.9 and 160.9 cm, respectively, substantially shorter than Beijing (175.2 and 167.3 cm) and Shanghai (173.8 and 163.8 cm), for example (refer to Table 2 for greater details).

Proposing Hypotheses

Table 4 depicts structural changes in food consumption over the past half century, in Hong Kong, Mainland China, Japan and South Korea. HK has been the greatest in respect of per capita intakes of (meat+fish), nearly twice as big as Mainland China, Japan and South Korea in the 2000s. What struck the author the most, HK has been very low in respect of per capita consumption of vegetables. Mainland China increased per capita consumption of vegetables from 50 kg in the 1970-80s to 330.7 kg in 2010, whereas HK increased very slowly from 85 kg to 100 kg over the same period. Hong Kong was as low as Japan in respect to per capita consumption of vegetables in the 2000s, one half the level of South Korea and one third that of the mainland China. A high animal protein does not result in increasing body height, if consumption of essential nutrients: vegetables and fruit is insufficient, as stated by Mathias Blum, 2013 [10]; Mori [11,12]. In addition, high levels of GDP per person may not correlate well with body height.

Acknowledgement: Sincere thanks go to John Dyck, formerly senior economist at ERS/USDA, for his comments and thorough editing.

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