brought together top academics and more than 100 health leaders from China to discuss key economic and policy issues in China's current health reform, including Professor William Hsiao from Harvard University, Professor Qide Han, the Vice-Chairman of the People's Congress, and senior leaders from the Ministry of Health. The West Lake Forum also featured CHPAMS' debut – Dr. Lincoln Chen, the President of China Medical Board formally announced the formation of this Society at the conference. Its initiatives and mission were highly applauded by both health researchers and policymakers at the meeting.

In December 2009, CHPAMS received a seed grant from CMB to support its ongoing activities in the next two years. This fund will be used to build CHPAMS' infrastructure, membership base, and to support the publication and circulation of its' own magazine – China Health Review (CHR). Meanwhile, we are actively planning for a series of exciting activities, including forming an advisory board, merging with several other organizations with similar objectives and missions, organizing seminars given by renowned health scholars in the U.S. or China, and planning for annual conference for our members and other interested health scholars.

We are very excited about the idea that through CHPAMS we can participate in China's health care reform, and eventually get our voice heard and make a difference! It is also our hope that CHPAMS will serve as a platform for young and established health scholars to network with each other and to grow professionally. We look forward to having you joining this Society! We believe that with your participation and support, the Society as a whole and we as individuals will grow in tandem.

For more information about this Society, please visit our website at www.chpams.org. If you have any feedback to our work or are interested in joining this Society or participating in any of our activities, please do not hesitate to contact us at chpams.org@gmail.com. Thank you for your interests, and the warmest welcome from the Planning Committee!

Jian Li, PhD, MS, Cornerstone Research

On behalf of
The Planning Committee of
The China Health Policy and Management Society (CHPAMS)

TOPICAL REVIEW

The Growing Obesity Epidemic and Its Health and Financial Consequences in China

INTRODUTION

Over the past three decades, China has enjoyed impressive economic development. Chinese People have experienced many dramatic changes in their lifestyles thanks to the increases in family income and availability of food as a result of China's economic reform and the growing global trade. People's lifestyles are becoming increasingly sedentary. Compared to other groups, children and adolescents are likely to be affected to a greater extent by these changes, partially due to China's 'one-child policy'.

Increasing research including ours suggests that the prevalence of obesity has increased in China both in children and adults.

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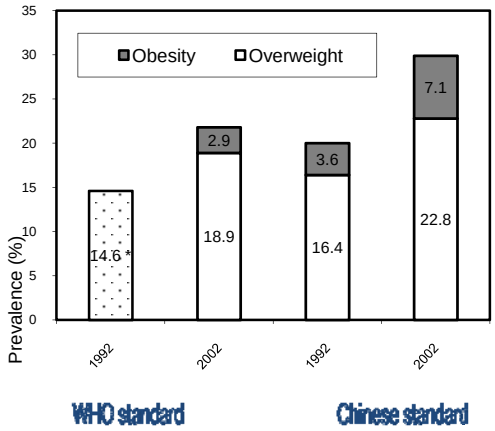
With the increase in obesity, obesity- and diet-related chronic diseases such as hypertension, cerebrovascular disease (CVD), and type 2 diabetes also increased over the past decade and have became the most important preventable cause of death. On the other hand, data collected from pre-school children show that undernutrition remains a public health concern, particularly in poor and rural areas. This article discussed the obesity related issues in China, predominately based on some of our recent research.

PREVALENCE AND TRENDS OF OBESITY AMONG ADULTS IN CHINA

In China, people are considered overweight if their body mass index (BMI) ≥ 24. If their BMI ≥ 28, they will be considered as obese. In general, the World Health Organization (WHO) recommends use of BMI cut points of 25 and 30 to classify these conditions for international use.

Nationally representative data have been collected in China allowing for examining the time trend in obesity. Between 1992 and 2002, the prevalence of overweight and obesity increased in all gender and age groups, and in all geographic areas. Using the WHO BMI cut points (BMI ≥ 25), among adults in China, the combined prevalence of overweight and obesity increased from 14.6% to 21.8% during this period, while based on the Chinese standard (BMI ≥ 24), it has increased from 20.0% to 29.9% (Figure 1). Middle-aged men and women were more likely to be overweight or obese than their younger and older counterparts. Take Beijing as an example of major cities in China, approximately 60% of Beijing adult residents were overweight or obese (BMI ≥ 24) and 20% were obese (BMI ≥ 28) in 2002.

Figure 1. Increase in the prevalence (%) of overweight and obesity among adults (aged >=18 y) in China based on the WHO and Chinese standards: 1992 to 2002



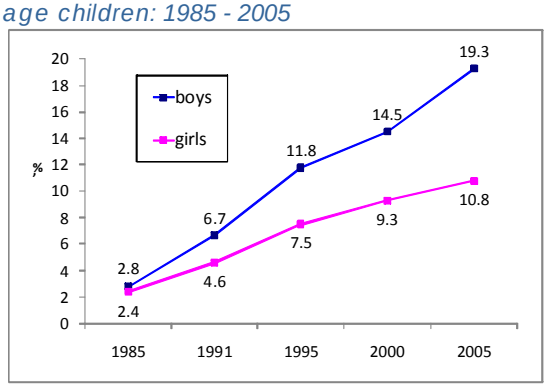
Based on data from the 1992 China National Nutrition Survey and the 2002 China National Nutrition and Health Survey. Based on the WHO standard, obesity was defined as BMI>=30 and overweight 25<=BMI<30; Chinese standard, obesity BMI>=28 and overweight 24<=BMI<28.
**The combined prevalence, the prevalence of obesity was not reported.*

The available data show large disparities between regions and groups, even among urban areas. In major cities, during recent years, the prevalence of obesity has increased more dramatically than in inland cities. Similar to the situation in some other developing countries, there are large urban-rural differences in the prevalence of overweight and obesity in China (both in adults and children), and the prevalence in urban areas is higher. Different from most industrialized countries, in China people with higher income and better education are more likely to be overweight or obese.

PREVALENCE AND TRENDS OF OBESITY IN CHILDREND IN CHINA

The 2002 China National Nutrition and Health Survey (CNHNS) data show that the prevalence of overweight and obesity in children aged 0-18 years was 4.1% and 2.1%, respectively. In urban areas, the combined prevalence was 12.9% among school-age children (≥ 7 years). In northern coastal big cities, the combined prevalence had reached 32.5% in boys and 17.6% in girls (both ≥ 7 years) in 2005 (Ji & Cheng, 2009), which is similar to the level in some industrialized countries (Wang & Lobstein, 2006). Data collected in another series of representative cross-sectional surveys in metropolitan areas from elementary and secondary school students show that the prevalence of overweight and obesity in boys and girls have increased remarkably, approximately by 10 times (see Figure 2, Ji and Cheng, 2009). Similar as for adults, there are large between region and groups

Figure 2. Trends in prevalence (%) of overweight and obesity among Chinese school age children: 1985 - 2005



Based on Chinese BMI cut points.

differences in the prevalence and trends. For example, in large cities such as Shanghai and Beijing, one in every five children is overweight or obese.

TRENDS IN MORBIDITY AND MORTALITY OF NONCOMMUNITABLE CHRONIC DISEASES IN CHINA

Table 1 shows the trends in the prevalence of obesity-related chronic diseases between 1993 and 2003 based on national monitoring data published by the Chinese Ministry of Health. Over this period, the morbidity rate (per 1,000) of infectious disease dropped, while that of nutrition-, endocrine- and metabolism-related disease (NEMD) more than doubled. The prevalence of diabetes tripled and that of hypertension more than doubled. The CNHNS02 data show that nearly 1/5 of Chinese adults had hypertension and dyslipidaemia, respectively. Thus, a large number of people in China were affected by obesity-related chronic disease.

Similarly, during this period, total mortality rate and the mortality rate of infectious disease was reduced remarkably, but the mortality rate for NEMD and its proportion of the total death increased. The mortality rates of heart disease and CVD decreased in urban areas, but increased in rural areas. The reduction in the mortality rates of heart disease and CVD in urban areas was smaller than that of total mortality. This may be due to improved health care and treatment for these conditions in urban areas while the morbidity of these conditions increased in both urban and rural areas. For example, urban patients who suffered from heart attack or stroke were less likely to die than their rural counterparts, since they had better access to medical service. CVD had already become the leading cause of death in China by the 1990s.

MAIN FACTORS THAT HAVE CONTRIBUTED TO THE INCREASE IN OBESITY AND OTHER NONCOMMUNITABLE CHRONIC DISEASES IN CHINA

Obesity is believed to be the result of a number of biological, behavioral, cultural, social, and environmental factors and the complex interactions between them that promote a positive energy balance. It is argued that the rapid increase in the prevalence of obesity worldwide over the past

Table 1. Trends in morbidity (per 1000) in China, 1993 - 2003

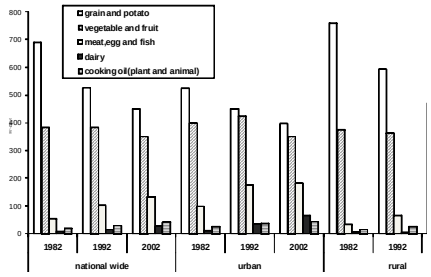
	1993	1998	2003	Annual increase(in %)
Infectious disease	5.3	4.8	2.7	-0.26
Cancer	1.9	2.1	2.1	0.02
NEMD*	3.1	4.7	7.5*	0.44
Diabetes	1.9	3.2	5.6	0.37
Circulation system disease	31.4	38.8	50.0	1.86
Heart disease	13.1	14.2	14.3	0.12
Hypertension	11.9	15.8	26.2	1.43
Cerebrovascular disease	4.0	5.9	6.6	0.26

Data from the Chinese Ministry of Health: Annual Statistical Reports of Death, Injury and Cause of Death in China, 1993-2003. People of all ages were included.
*NEMD, Nutrition, endocrinology and metabolism related disease. The coding system of NEMD was changed in 2003, i.e., several diseases were grouped into other categories. Otherwise, the figure would be higher. The diagnostic criteria for diabetes were comparable over time. (Wang et al, 2007)

two decades probably suggests that environmental factors, but not genetic factors, are the major risk factors, because genetic factors cannot change so dramatically within such a short period.

The rapid increase of obesity and the large disparities between population groups and regions in the prevalence and secular trends in China are particularly a result of the rapid economic development and shifts in people's lifestyles and the differences in these shifts over the past two decades. The following highlights several such indicators. China's per capita GDP has increased dramatically in the past two decades. This results in a steady increase in family income and improvements in people's living standards. On the other hand, this may have a number of unintended consequences such as shift in people's lifestyles.

Figure 3. Trends in food consumption (grams/per day per reference man) in China: 1982, 1992 and 2002



**The 1982, 1992, and 2002 China National Health and Nutrition Survey. Reference man refers to adult men with light to medium physical activity.*

Chinese citizens have experienced many dramatic changes in their lifestyles, including dietary intake and physical activity. Chinese diet has shifted from a traditional dietary pattern, which typically contains large quantities of plant foods including grains and vegetables, to the Western dietary pattern characterized by high intakes of meats, fat, and sugar (Wang, 2005). Nationally representative data show that the consumption of animal foods and dairy products have increased, while the consumption of plant foods, including grains, fruit, and vegetable has steadily decreased, especially in urban areas. Consumption of cooking oil increased dramatically, especially of plant cooking oil (Figure 3).

Western fast food industry has marketed aggressively in China, and Western fast food (which remains much more expensive than local food) and locally marketed and produced similar high-fat and energy-dense food are becoming an important part of urban children's diet. Based on a recent report, by 2008, KFC has more than 2,200 outlets in some 450 cities and McDonald's has 950 outlets in China.

Changes in China have also contributed to the growing sedentary lifestyle among children and adults in China. Screen time, such as time spent watching television, playing computer and video games, has increased. For example, the television ownership increased from 17.2 per 100 urban households in 1985 to 134.8 to 2005. Changes in the means and options of transportation could be another factor. For example, during recent years, the use of bicycles has continued declining as a result of more convenient public transportation system, taxi, family-owned motorcycles and automobiles. According to China's Bureau of Statistics, urban household automobile ownership had increased by 1,160 times between 1999 and 2006. One study shows that 14% of the Chinese households acquired a motorized vehicle between 1989 and 1997. The odds of being obese were 80% higher for adults in households that own a motorized vehicle, compared to those that do not.

DISCUSSION AND CONCLUSIONS

China has experienced many rapid economic and social developments and changes over the past three decades. These have resulted in a number of major shifts in people's lifestyles, most of which have contributed to overconsumption of foods but reduced physical activity. Thus, China now is seeing a rapidly growing obesity epidemic.

Obesity increases the risks for many chronic diseases such as hypertension, type 2 diabetes, coronary heart disease, and stroke; therefore, the epidemic increases healthcare costs. Childhood obesity could track into adulthood and has a lot of health and financial consequences.

It is estimated that the total medical cost attributable to overweight and obesity might be 21.11 billion Chinese Yuan (RMB, approximately US$2.74 billion), which accounted for 25.5% of the total medical costs for the four major obesity-related chronic diseases namely hypertension, type 2 diabetes, coronary heart disease and stroke, or 3.7% of China's national total medical costs in 2003. The medical cost associated with obesity could increase rapidly in the future. The economic costs related to the nutrition transition, in particular, the changing lifestyles and increase in obesity and related chronic disease in China, may represent 4-8% of China's economy.

The United States can serve as an example to indicate the seriousness of the financial consequences of the obesity epidemic, and to show that the warnings made recently for China can become true if its growing obesity epidemic could not be controlled effectively. One of our recent studies projected that in the United States, medical costs attributable to overweight and obesity have already reached 72-82 billion US dollars and accounted for 12-13% of total US healthcare costs. The total healthcare costs attributable to obesity/overweight would double every decade to 860.7-956.9 billion US dollars by 2030, accounting for 16-18% of total US healthcare costs, if the obesity trend continues in the U.S.

China already has had the largest number of overweight and obese people on earth. Timely attention and adequate effort should be made to prevent childhood obesity and to address the rapidly growing obesity epidemic in China. Comprehensive, national programs should be developed. In particular, while today China is making great effort and investing heavily to improve her citizen's health and access to healthcare service (e.g., the Healthy China 2020 Program), multiple parties such as parents, children, health professionals, schools, media, food industry, and the central and local government agencies should all be involved for promoting healthy lifestyles and for the prevention of obesity. China should learn from the failure and successful experience of other countries in combating the obesity epidemic. Promotion of healthy lifestyles including healthy eating and adequate physical activity and avoiding first and second-hand tobacco smoking is important for the Nation's long-term development and for Chinese people's health and life quality This should be included as an important part of national priorities.

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INTERVIEW

INTERVIEW WITH DR. LINCOLN CHEN

Dr. Lincoln C. Chen

Dr. Lincoln C. Chen is President of the China Medical Board (CMB), an independent American foundation endowed by John D. Rockefeller to advance health in China and Asia by strengthening medical education, research, and policies. He was the founding director of the Harvard Global Equity Initiative (2001-2006), and in an earlier decade, the Taro Takemi Professor of International Health and Director of the Harvard Center for Population and Development Studies (1987-1996). Dr. Chen is renowned for