



Healthcare Policy and Burden of Diet- and Nutrition-Related Chronic Diseases in China

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In the last 3 decades, the rapid development of the Chinese national economy has been accompanied by social change and an improved standard of living. These changes have brought about significant changes in food consumption, dietary patterns, and lifestyle, as well as in health and disease patterns. The burden of diet- and nutrition-related noncommunicable diseases (NCDs) and their major determinants, as well as the policies, strategies, and actions needed to control these diseases, are emerging healthcare concerns in China.

Burden of Diet- and Nutrition-Related NCDs in China

Causes of Death

NCDs have become China's number one killer. They account for over 85% of annual deaths and contribute to 70% of the total disease burden. The Third National Retrospective Death Causes Survey conducted in 2004–2005 showed that cerebrovascular disease, cancers, and heart disease accounted for 22.45%, 22.32%, and 14.82% of total deaths in China, respectively (Fig 1).¹ The proportion of NCDs in total deaths increased from 53% to 85% between 1973 and 2009.

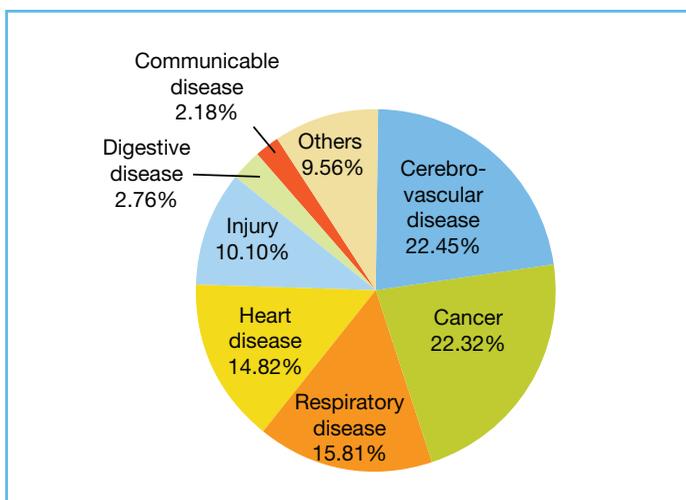


Fig 1. Causes of death in China, 2004–2005.¹

Source: Ministry of Health. *The Report of the Third National Retrospective Survey for Death Causes.* Beijing, China: Peking Union Medical College Press; 2008.

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Prevalence

Hypertension. Hypertension is one of the most important diseases and the most important risk factor for stroke and other cardiovascular disease in China. According to three national hypertension epidemiology surveys conducted in 1959, 1979, and 1991, and the 2002 China National Nutrition and Health Survey,² the crude prevalence of hypertension in China among people aged 15 years and older increased from 5.11% in 1959 to 17.65% in 2002. The prevalence of hypertension among Chinese adults aged 18 and older reached 33.5% in 2010. It is estimated that 200 million Chinese adults had hypertension in 2012.

Type 2 diabetes. The prevalence of type 2 diabetes in China in the 1980s was only 0.8%. However, the 2002 national survey showed that the national prevalence of type 2 diabetes has reached 2.6% and was much higher (6.1%) in large cities.³ According to the 2010 China Chronic Disease Surveillance results, the prevalence of diabetes among Chinese adults aged 18 years and above was 9.7% (Fig 2).⁴

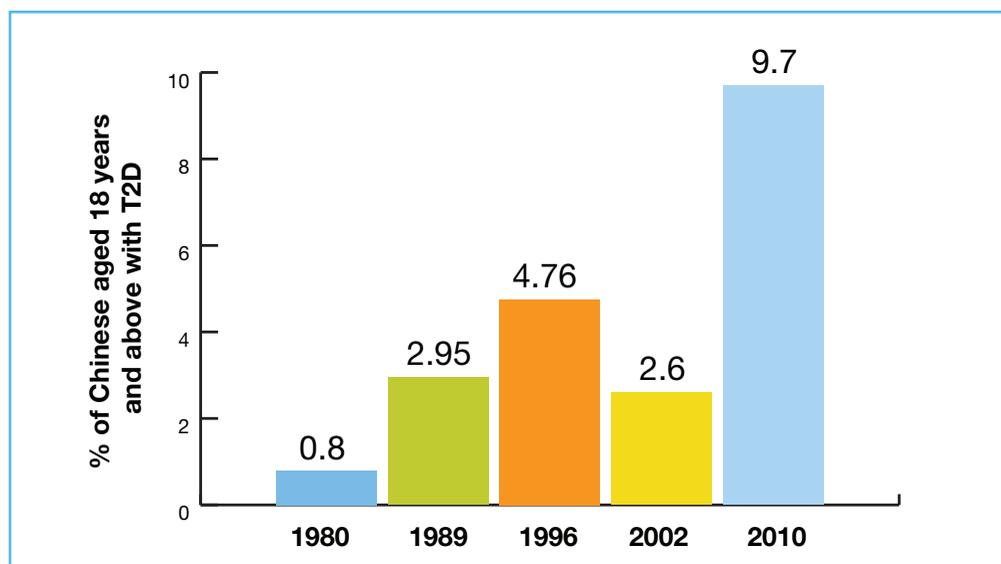


Fig 2. Increase in prevalence of type 2 diabetes in China, 1980–2010.^{3,4}
T2D=type 2 diabetes

Sources: 2002 China Health and Nutrition Survey. Available at <http://www.cpc.unc.edu/projects/china/data>. Accessed October 15, 2012. 2010 China Behavioral Risk Factor Surveillance System. Available at <http://www.chinaccd.cn>. Accessed October 15, 2012.



Overweight and obesity. The prevalence of overweight and obesity has increased significantly over the last decade. In 2002, 22.8% of Chinese adults were overweight and 7.1% were obese.³ During the decade between 1992 and 2002, the overweight rate in adults increased by 40.7% and the obesity rate increased by 97.2%. According to the China Chronic Disease Surveillance data, the prevalence of overweight among adults aged 18–69 years was 23.1% in 2004, 27.3% in 2007, and 28.6% in 2010, and the obesity rate was 7.2% in 2004, 8.0% in 2007, and 12.0% in 2010.⁴ At the same time, the prevalence of overweight and obesity among Chinese children and adolescents also increased rapidly, especially in large cities.

Economic Burden

In 2009, on average, the cost of hospital admission for a typical NCD patient was 50% of the disposable annual income of an urban resident (5176.9 RMB [Renminbi, or yuan], or 750 USD [US Dollars], per capita per year), and 1.3 times that of a rural resident (2009 RMB, or 291 USD, per capita per year).⁵ The highest cost was for a coronary artery bypass operation, which was 1.2 times higher than the annual disposable income of an urban resident, and 6.4 times higher than the net annual income of a rural resident. The total medical cost caused by NCDs in China was 1.48 trillion RMB (210 billion USD) in 2005. The proportion of the NCD disease burden increased from 54% in 1993 to 63% in 2005. According to the Report on Disease Burden Research published by the World Health Organization in 2009, NCDs accounted for nearly 69% of the total of disease economic burden in China.⁶

The total medical cost attributable to overweight and obesity was estimated at 21.11 billion yuan (RMB) in China in 2002, accounting for 25.5% of the total medical costs for the four chronic diseases, or 3.7% of national total medical costs in 2003.⁷ The direct costs of hypertension, diabetes, coronary heart disease, and strokes attributable to overweight and obesity were 37.4%, 34.2%, 11.3%, and 23.3% in 2002, respectively.

Major Determinants

Diet and nutrition transition. The dietary pattern of Chinese people has undergone dramatic changes since the 1950s, especially in the last 3 decades. Four national nutrition and health surveys have been conducted in China since 1959. The second, carried out in 1982, showed that the nutritional status of the Chinese population was greatly improved as compared with the data in the 1950s. The third, conducted in 1992, showed that the main features of the dietary transition are a decrease in

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grain and carbohydrate intake and an increase in meat, poultry, fish, and edible oil/fat intake (Fig 3).^{3,8} The trend toward westernization of the Chinese diet is quite obvious, although the current average diet is still plant-based.

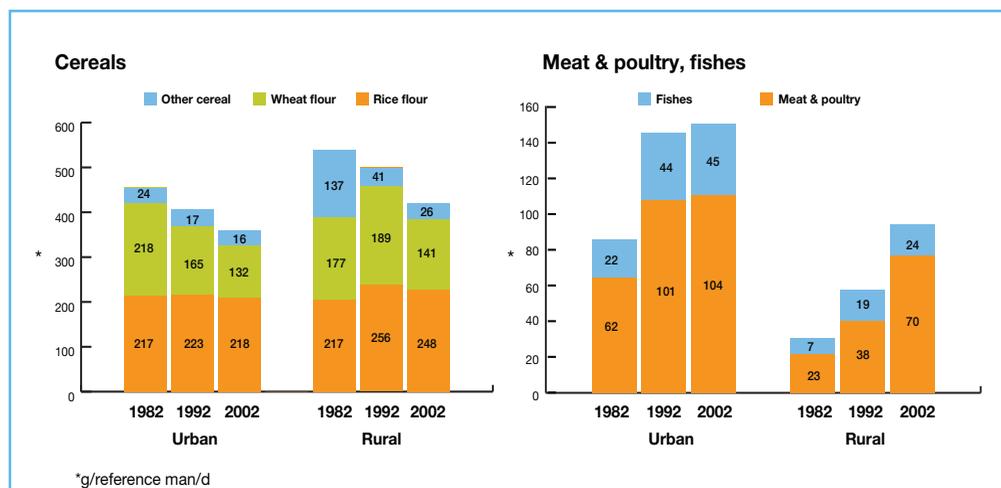


Fig 3. Changes in patterns of food consumption in urban and rural China, 1982–2002.³

Source: 2002 China National Nutrition and Health Survey. Available at <http://www.cpc.unc.edu/projects/china/data>. Accessed October 15, 2012.

The fourth survey, which was conducted in 2002, showed that the main features of the dietary transition are several significant changes in the dietary pattern:

- Dietary fat intake was close to 30% of total dietary energy intake. These data indicate that the diet of urban Chinese is imbalanced, and the diet of rural Chinese is getting better compared with the Chinese dietary guidelines.
- The consumption of edible oil is increasing significantly. The national average consumption of edible oil in 1982, 1992, 2002 and 2010 was 18.0, 29.5, 41.6, and 49.1 g/capita/day, respectively.^{3,4}

High salt intake is a traditional dietary habit among both urban and rural Chinese. Average daily salt intake for a reference man in 1982, 1992, and 2002 was 12.7, 13.9, and 12.0 g/day, respectively.³ This is approximately twice the level recommended by Chinese dietary guidelines.



Physical activity. Increasing urbanization and industrialization are associated with a dramatic decrease in physical activity level, and lifestyles of the Chinese in general have become more sedentary, as indicated by the low percentage of Chinese people exercising regularly. In 2007, less than 12% of Chinese aged 16 years and older undertook regular exercise three times a week for 30 minutes.⁹ Since the 1990s, the number of private cars has increased by more than 40 times, contributing to the decrease in physical activity.

Healthcare, Nutritional Improvement, and NCD Control Policies, Strategies, and Actions in China

Policies and Strategies

China's government is committed to meeting the challenges of NCDs and improving the nutritional status of the Chinese people. Several policies and strategies have been established:

- Increasing life expectancy by 1 year was set as one of the major goals of the 12th Five-Year Plan (2011–2015) for National Economic and Social Development.
- The *Compendium for Food and Nutrition Development in China (2001–2010)* was issued by the General Office of the State Council in 2001.
- China National NCDs Control and Prevention Plan (2012–2015) was launched May 30, 2012, and it was jointly signed by 15 Ministries.
- The Chinese Health Reform, started in 2009, identified five key reform tasks for 2009–2011: the establishment of a basic health insurance system, establishment of a basic national medicine system, improvement of the grassroots healthcare service system, accelerated equalization of primary healthcare services, and enhancement of the trial reform of public hospitals.

Actions

In 2007, The National Action on Healthy Lifestyle for All was initiated by the Ministry of Health. The first phase of the campaign was focused on balanced diet and physical activity. By 2010, the campaign had expanded to all 31 provinces in Mainland China and was set as an important platform for health promotion. The Project on Path to Health, which aims to establish exercise facilities in communities across the country, was initiated by the General Administration of Sports, China, in 2000. Sustainable funding of 40 million USD annually was provided by the Chinese Sports Lottery Fund.

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Technical guidelines have been established, including Chinese Guidelines on Adult Obesity Control and Prevention, Chinese Guidelines on Childhood Obesity Control and Prevention, Chinese Dietary Guidelines and Chinese Food Pagoda, Chinese Guidelines for Hypertension Control and Prevention, Chinese Guidelines for Diabetes Control and Prevention, and Chinese Guidelines on Adult Physical Activity. These guidelines, developed by related scientific societies, mostly have been issued by the Ministry of Health.

Providing health management services for patients with hypertension or diabetes has been given high priority. By the end of March, 2011, the number of patients under standardized disease management reached 42 million with hypertension and 11 million with diabetes.⁹

Conclusion and a Perspective on Nutrition Improvement and NCD Control in China

China's NCD epidemic will continue to explode over the next 20 years if not addressed effectively. Much of the diet- and nutrition-related NCD burden can be avoided and controlled by the adoption of good practices that have been proven effective internationally, and their adaptation to local conditions. By reducing unhealthy behaviors and improving nutritional status through balanced diets and increased physical activity, by improving socioeconomic environments conducive to health, and by expanding access to quality healthcare services, people will not only live longer, but their quality of life will improve due to the reduction of chronic disease and disability at the end of life.

Acknowledgement

This research uses data from the China Health and Nutrition Survey (CHNS). We thank the National Institute of Nutrition and Food Safety, China Center for Disease Control and Prevention; the Carolina Population Center, University of North Carolina at Chapel Hill; the National Institutes of Health (NIH; R01-HD30880, DK056350, and R01-HD38700); and the Fogarty International Center, NIH, for financial support for the CHNS data collection and analysis files since 1989. We thank those parties, the China-Japan Friendship Hospital, and the Ministry of Health for support for CHNS 2009 and future surveys.



References

1. Ministry of Health. *The Report of the Third National Retrospective Survey for Death Causes*. Beijing, China: Peking Union Medical College Press; 2008.
2. Wu Y, Huxley R, Li L. Prevalence, awareness, treatment, and control of hypertension in China: data from the China National Nutrition and Health Survey 2002. *Circulation*. 2008 Dec;118(25):2679-2686.
3. 2002 China National Nutrition and Health Survey. Available at <http://www.cpc.unc.edu/projects/china/data>. Accessed October 15, 2012.
4. Chinese Center for Disease Control and Prevention, 2011. *Summary of 2010 China Chronic Disease and Behavior Risk Factor Surveillance*. Available at <http://www.chinacdc.cn>. Accessed October 15, 2012.
5. Ministry of Health, 2010. *China Health Statistic Yearbook*. Ministry of Health, Beijing, China. Available at <http://www.moh.gov.cn>. Accessed October 15, 2012.
6. World Health Organization. *Report on Disease Burden Research*. Geneva, Switzerland; 2009.
7. Zhao W, Zhai Y, Hu J, et al. Economic burden of obesity-related chronic diseases in Mainland China. *Obes Rev*. 2008 Mar;9(suppl 1):62-67.
8. 1992 China Health and Nutrition Survey. Available at <http://www.cpc.unc.edu/projects/china/data>. Accessed October 15, 2012.
9. Bureau of Disease Prevention and Control, Ministry of Health, Chinese Center for Disease Control and Prevention. *Report on Non-Communicable Disease in China*. Ministry of Health; Beijing, China; 2011.