

Develop top-level policy design for obesity prevention and treatment to support the construction of a Healthy China

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Executive summary

Since its reform and opening-up, China has made great achievements in economic and social development, such as its per capita gross domestic product (GDP) exceeding the average amount for upper-middle-income countries. Since the full rollout of the *Healthy China 2030* initiative in 2016, China now also fares among top-performing middle- and high-income countries in terms of key health indicators. Between 2015 and 2021, life expectancy increased from 76.34 to 78.2 years, the maternal mortality rate fell from 21.8 to 16.1 per 100,000 live births, the infant mortality rate decreased from 8.1 to 5.0 per 1,000 live births, and the under-five mortality rate decreased from 10.7 to 7.1 per 1,000 live births in China.

China's rapid economic and social development changes have also led to a rise in chronic diseases such as cardiovascular and cerebrovascular diseases, cancers, and diabetes. Additionally, an abundance of food, combined with sedentary lifestyles, have brought about a rapid increase in the prevalence of people suffering from excessive weight and obesity. Obesity has ultimately become a grave public health concern, both as a chronic disease in its own right and as a risk factor for numerous other chronic diseases.

Obesity can be defined as abnormal or excessive fat accumulation that is usually chronic, relapsing, and multifactorial which may impair a person's health. Globally, the rising prevalence of obesity imposes a significant disease burden on nations, leading to social and economic repercussions. According to the World Health Organization (WHO), the number of overweight adults in 2016 stood at 1.9 billion. Among them, 650 million were obese. More than 378 million children and adolescents were found to be overweight or obese as well. As of 2020, the World Obesity Organization (WOO) reported that global obesity prevalence had increased to around 764 million adults and 157 million children and adolescents under eighteen. The number of obese adults is projected to reach 1.03 billion in 2030, doubling 2010's figure.

Obese patients are at a significantly higher risk of developing more than 200 diseases including cancers, cardiovascular diseases, diabetes, and kidney diseases. Obesity increases the risk of 11 types of cancer and is closely linked to a further 21 diseases, all of which result in a significant global disease burden. Meanwhile, overweight and obese populations also exacerbate global issues regarding inequality, with costs related to obesity management and treatment putting tremendous pressure on nations' healthcare systems and economies.

In April 2022, the **WHO released the *Acceleration Plan for the Prevention and Management of Obesity over a Life Course***, creating an overarching policy framework for global obesity prevention and control. The WHO's *Action Plan* recommends member nations take all demographic groups, aspects of obesity, and lifecycle stages into consideration, as well as utilize all necessary tools such as obesity prevention, self-management, medical management, and specialized treatment. Some countries such as the UK and Singapore also provide valuable policies and pathways for obesity prevention and control.

China's overweight and obesity incidence is rapidly increased in recent years, leading to severe challenges in its prevention and control. According to the WHO standard, in which a BMI of 30kg/m² or greater is considered obese, China ranks first in the world for the number of obese children and second in the world for the number of obese adults. By Chinese standards (BMI \geq 28kg/m²), China ranks first in the world for the number of obese people. By both standards, the prevalence of obesity doubled between 2004 and 2014. According to the latest survey, more than 50 percent of adults, almost 20 percent of children and adolescents aged 6-17, and 10 percent of children under six are currently overweight or obese.

While the disease burden of overweight and obesity in China is consistent with that of other countries, China still needs to improve its obesity monitoring system. As its prevalence increases, overweight and obesity not only cause a series of social problems at the individual, household, and societal levels, such as impacting the national fertility rate, but also impose a long-term burden on China's economy as related costs continue to increase in total health expenditure. By 2030, obesity-related medical costs will reach RMB 418 billion in China, which would account for about 22 percent of the total national health expenditure.

Given global experiences as well as the severe challenges imposed by overweight and obesity, it is urgent for China to strengthen its top-level policymaking in relevant fields and comprehensively improve systematic planning on all levels, from macro decision-making to meso-level cross-industry policy system establishment and implementation, in a bid to best

strengthen holistic prevention and control and mobilize all sectors of society to jointly deal with the challenges of the overweight and obesity epidemic. Thus, the following actions are recommended:

1. Macro-level Strategy: Obesity should be included in the national health plan as an independent disease, top-level design should be strengthened, and a special coordination mechanism should be established.

Obesity should be officially recognized as an independent chronic disease and included as a key condition in the *Healthy China Action Plan* and China's *Medium-to-Long Term Plan for the Prevention and Treatment of Chronic Diseases*. In addition, a special leadership coordination mechanism for obesity prevention and control should be established under the Healthy China Action Promotion Committee to coordinate cross-industry policy formulation.

2. Meso-Level: Establish an inter-industry, holistic, full life-cycle obesity prevention and treatment policy system for all age groups, covering the entire population.

Under the guidance of the government, relevant interdisciplinary expert committees should be set up to build a comprehensive full life-cycle obesity prevention and treatment system that spans different industries, serves the entire population, and covers health promotion, prevention, diagnosis, treatment, and health management. In non-medical fields, it is recommended to accelerate the implementation of a range of evidence-based interventions and improve relevant policy and legal systems.

3. At the implementation level: Integrate the full-cycle management of obesity prevention and treatment into the existing healthcare system, enable the creation of specialized diagnosis and treatment capacities for obesity, and strengthen the monitoring and information collection of interdisciplinary disease burden and related research.

1) Integrate the health promotion, prevention, diagnosis, treatment, and management of obesity into the existing healthcare policy implementation system to improve coverage and effectiveness.

2) Improve the formulation of obesity diagnosis and treatment policies, and enable capacity building for obesity diagnosis and treatment.

3) Strengthen monitoring, information collection, and related research regarding the burden of obesity and its associated diseases.

Novo Nordisk, as a leading global biopharmaceutical company specialized in diabetes, obesity, and other serious chronic diseases, is committed to preventing and eventually curing chronic diseases through its leading technological breakthroughs and expanding access to medicines. With its various product and extensive management experiences, Novo Nordisk is willing to deepen cooperation with the Chinese government, including actively sharing international experience

in obesity prevention and treatment and providing support for relevant public-private cooperation projects, and ultimately contributing to the realization of the *Healthy China 2030* objectives.

1. Background

Since its reform and opening-up, China has made great achievements in economic and social development. By 2022, China's per GDP reached USD 12,741,¹ higher than the average of USD 10,363 for upper-middle-income countries. Since the launch of the *Healthy China 2030* initiative in 2016, China now fares among top-performing middle- and high-income countries in terms of key health indicators. Between 2015 and 2021, life expectancy increased from 76.34 to 78.2 years, the maternal mortality rate fell from 21.8 to 16.1 per 100,000 live births, the infant mortality rate decreased from 8.1 to 5.0 per 1,000 live births, and the under-five mortality rate decreased from 10.7 to 7.1 per 1,000 live births in China.

However, China's rapid economic and social development changes have also led to a rise in chronic diseases, as an abundance of food, combined with sedentary lifestyles, brought about a rapid increase in the prevalence of people suffering from excessive weight and obesity. Over the past 40 years, body mass index (BMI) has been rising among all age groups, with both generalized and abdominal obesity becoming the main risk factors for the development of chronic disease among adults. According to the *Healthy China Action Plan (2019-2030)*, chronic diseases such as cardiovascular and cerebrovascular diseases, cancers, and diabetes account for more than 70 percent of the total disease-related medical burden, hindering the further improvement of a healthy life expectancy in China. Obesity has ultimately become a critical public health concern, both as a chronic disease in its own right, and as a risk factor for numerous other chronic diseases.

2. Globally, the rising prevalence of obesity imposes a significant disease burden on nations, leading to social and economic repercussions. Many countries have gained invaluable experience with obesity, adopting policy frameworks for prevention and treatment that can help China develop its own response.

Overweight and obesity can be defined as abnormal or excessive fat accumulation that may impair a person's health, and these conditions are usually chronic, relapsing, and multifactorial. Obesity is correlated with a variety of factors, such as genetics, biological differences, healthcare access, ultra-processed foods, and socioeconomic status. It is also a significant risk factor for several other non-communicable diseases (NCDs) such as diabetes, heart disease, and cancer.² Based

¹Xinhua News Agency: China's 2022 GDP Exceeds 120 trillion RMB. http://bj.news.cn/2023-01/17/c_1129292805.htm

² World Obesity Atlas [2022-3] <https://data.worldobesity.org/publications/World-Obesity-Atlas-2022>

on the global standard for adults, a BMI greater than or equal to 25 is considered overweight, whereas a BMI greater than or equal to 30 is considered obese.³ According to the WHO, the number of overweight adults in 2016 stood at 1.9 billion. Among them, 650 million were obese. More than 378 million children and adolescents were found to be overweight or obese as well.³ As of 2020, the World Obesity Federation (WOF) reported that global obesity prevalence had increased to around 764 million adults and 157 million children and adolescents under eighteen.⁴ The number of obese adults is projected to reach 1.03 billion in 2030, doubling the figure in 2010.² The rising global obesity prevalence causes diseases to increase, resulting in a heavier social and economic burden. During the COVID-19 pandemic, obese patients were at greater risk of severe illness and hospitalization, serving as a reminder that more efforts should be expended toward preventing and treating obesity in the future.

Concerning disease burden, obese patients are at a significantly higher risk of developing more than 200 diseases, including cancers, cardiovascular diseases, diabetes, and kidney diseases. The WHO Obesity Disease Burden Report highlighted that individuals with a BMI exceeding 35 kg/m² live on average six to seven fewer years in good overall health, and nine to ten fewer years free from CVD, respiratory disease, or cancer.⁵ Following the methodology framework used in the Global Burden of Disease (GBD), global death and disability-adjusted life years (DALYs) attributable to high BMI are analyzed. Data from studies by the US National Health Institute (NIH) indicated that DALYs and death attributable to high BMI increased by more than 100 percent between 1990 and 2017. In 2017, high BMI caused more than 147 million DALYs and 4.7 million deaths globally.⁶

During the COVID-19 pandemic, obese COVID patients were at higher risk of developing complications. After adjusting for potential confounding factors, studies have shown that obese groups had 2.42-fold higher odds of developing severe pneumonia than normal-weight groups. Additionally, there is a demonstrated correlation between high BMI and the likelihood of hospitalizations and intensive care unit (ICU) admissions—patients with BMIs higher than 30 and 35 are 1.8 times and 3.6 times, respectively, more likely to require intensive care compared to

³ WHO. Overweight and Obesity. [2020-4-1] <https://www.who.int/zh/news-room/fact-sheets/detail/obesity-and-overweight>

⁴ World Obesity Atlas 2022 [2022-3] <https://data.worldobesity.org/publications/World-Obesity-Atlas-2022>

⁵ WHO. Obesity Disease Burden Report.

<https://apps.who.int/iris/bitstream/handle/10665/353747/9789289057738-eng.pdf>

⁶ NIH. Obesity Disease Burden Attributable to High BMI

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7386577/#pmed.1003198.s002>

patients with BMIs lower than 30.⁷ Recent randomized controlled research findings demonstrated that patients who underwent successful weight-loss intervention and attained stable body weight prior to COVID-19 infection had a 60 percent lower risk of developing severe complications compared to patients who did not undergo obesity intervention.⁸ The evidence cited above further emphasizes obesity management as a critical component in public health strategies and as an important stepping stone in addressing related public health challenges.

Regarding the social burden, being overweight and obese can have a negative impact on a young person's health, self-esteem, and socioeconomic status later in life. Such repercussions could further exacerbate inequality and increase social burdens. A study conducted over seven years in the UK suggests that, compared to healthy groups, overweight groups received on average 0.3 years less education, are 20 percent less likely to be married, earn USD 6,710 less in household income, and are 10 percent more likely to fall below the poverty line.⁹

Regarding the economic burden, costs related to obesity management and treatment put tremendous pressure on nations' healthcare systems and economies. According to a GBD study, the direct costs of obesity refer to the cost of medical services to treat diseases correlated with high BMI. Whereas indirect costs refer to the loss of economic value due to a decline in personal productivity, increases in healthcare insurance premiums, unemployment, and premature deaths.¹⁰ According to WOF statistics released in 2020, obesity-related costs in the US, China, the UK, and Singapore represented 3.52 percent, 1.93 percent, 2.36 percent, and 1.05 percent of each country's GDP, respectively. These ratios are expected to increase to 4.5 percent, 3.61 percent, 2.49 percent, and 2.02 percent by 2050.¹¹

In April 2022, the **WHO released the *Acceleration Plan for the Prevention and Management of Obesity over a Life Course*** to support member states with implementing recommendations. The ***Action Plan*** became the overarching policy framework in global obesity prevention and management, covering prevention measures, treatment methods, and other related content. WHO recommended prevention measures such as regulations on the marketing of harmful food and

⁷ Obesity and outcomes in COVID-19: When an epidemic and pandemic collide. Mayo Clinic Proceedings. From <https://www.sciencedirect.com/science/article/pii/S0025619620304778>

⁸ Wheeler, T. (2021, December 29). Substantial weight loss can reduce risk of severe COVID-19 complications. Cleveland Clinic Newsroom.

⁹ Social and Economic Consequences of Overweight in Adolescence and Young Adulthood. <https://www.nejm.org/doi/full/10.1056/nejm199309303291406>

¹⁰ Economic Cost. Harvard School of Public Health. <https://www.hsph.harvard.edu/obesity-prevention-source/obesity-consequences/economic/>

¹¹ World Obesity Organization. Economic Impact of Obesity and Overweight. Country Results. <https://data.worldobesity.org/economic-impact-new/comparisons/>

beverages to protect children, and policies to promote field trips and physical activity in schools. In addition to these measures, WHO recommended that obesity prevention and management services should be integrated into primary health care and provide health guidance to patients through secondary and tertiary health care.¹²

Similar to WHO's *Acceleration Plan*, the UK National Health Service (NHS) developed a tiered care weight management pathway. Tier 1 is a behavioral intervention delivered by local and community healthcare teams. Tier 2 is lifestyle weight management services delivered by also local community weight management services that provide community-based diet, nutrition, lifestyle, and behavior change advice in a group setting. Normally, individuals can only access these services for a 12-week period. Tier 3 is non-surgical intensive medical management with a clinician-led multidisciplinary approach, in which patients are provided with diagnostics and innovative healthcare services. Tier 4 is bariatric surgery commissioned by clinical commission groups (CCGs) that are supplemented with pre-operative assessment and post-operative care and support.¹³

Singapore's Ministry of Health (MOH) released and implemented a series of obesity prevention and treatment policies and action plans entailing the following:¹⁴ a life-cycle approach obesity management strategy, the development of health-promoting public policies and guidelines, and the promotion of physical activity with incentives schemes.¹⁵ Moreover, Singapore's *Obesity Clinical Guidelines* provide patients with intervention options including lifestyle changes, medication, intra-gastric balloon therapies, and bariatric surgery, as well as clearly defined intervention assessment and execution standards.¹⁶

China can learn valuable lessons from other countries' experiences as it develops its own obesity management model. First and foremost, an effective overarching plan for obesity prevention and management must take entire populations, all aspects and lifecycle stages of obesity prevention, self-management, medical management, and specialized treatment into consideration.

3. In recent years, obesity has become a major public health concern, imposing a heavy disease burden and creating

¹² WHO. Workstreams of Acceleration Plans. https://apps.who.int/gb/ebwha/pdf_files/WHA75/A75_10Add6-en.pdf

¹³ NHS Tiered Care Weight Management Pathway <https://oen.org.uk/managing-obesity/nhs-tiered-care-weight-management-pathway/>

¹⁴ Obesity Prevention and management. <https://onlinelibrary.wiley.com/doi/full/10.1111/obr.12092>

¹⁵ Obesity Trend And Programs. <https://www.moh.gov.sg/news-highlights/details/obesity-trend-and-programmes>

¹⁶ Singapore 2016 Obesity ClinicalPractice Guidelines https://www.moh.gov.sg/docs/librariesprovider4/guidelines/obesity-cpg_main.pdf

significant social and economic impacts in China. The nation's health monitoring system also needs to be improved.

China's overweight and obesity issue is considered severe, with their incidence having rapidly increased in recent decades by both Chinese and international standards. According to the WHO standard, in which a BMI of 30kg/m² or greater is considered obese, China ranks first in the world for the number of obese children and second in the world for the number of obese adults. By Chinese standards (BMI \geq 28kg/m²), China ranks first in the world for the number of obese people. By both standards, the prevalence of obesity doubled between 2004 to 2014.¹⁷ According to the latest survey, more than 50 percent of adults, almost 20 percent of children and adolescents aged 6-17, and 10 percent of children under six are currently overweight or obese in China.¹⁸

As such, this critical situation imposes a heavy **disease burden** on China. Some global studies indicate that obesity increases the risk of 11 types of cancer¹⁹ and is closely linked to an additional 21 diseases.²⁰ While the disease burden of obesity in China is consistent with that of other countries, China still needs to improve its obesity monitoring system. Currently, among several nationwide surveys aimed at national physique and health monitoring, most are cross-sectional sampling surveys conducted every five years, using similar methodology and statistical indicators. Five indicators are used to measure obesity, namely BMI, obesity ratio, overweight ratio, waist circumference, and central obesity ratio. Among these indicators, complete data only exists for obesity and overweight ratios, whereas large gaps still exist in the data for other indicators.

Obesity and being overweight not only have multiple adverse effects on individual health and national physique, they also lead to **a series of social problems** and can impact fertility rates. According to a survey of women of childbearing age in more than a dozen cities across China, 18 percent of women were found to be infertile, and 80 percent of infertility cases could be attributed to being overweight or obese. Overweight or obese individuals may experience a decline in quality of life or may

¹⁷ Pan X-F, Wang L, Pan A. Obesity in China 2. Epidemiology and determinants of obesity in China. *Lancet Diabetes & Endocrinology* 2021; 9: 373-392.

¹⁸ The Information Office of the State Council held a press conference on the "Report on the Status of Nutrition and Chronic Diseases of Chinese Residents (2020)". The Publicity Department of the NHC. [2020-12-23] <http://www.nhc.gov.cn/xcs/s3574/202012/bc4379ddf4324e7f86f05d31cc1c4982.shtml>

¹⁹ Kyrgiou M, Kalliala I, Markozannes G, Gunter MJ, Paraskevaidis E, Gabra H, Martin-Hirsch P, Tsilidis KK. Adiposity and cancer at major anatomical sites: umbrella review of the literature. *BMJ*. 2017 Feb 28;356:j477.

²⁰ Kivimäki M, Strandberg T, Pentti J, Nyberg ST, Frank P, Jokela M, Ervasti J, Suominen SB, Vahtera J, Sipilä PN, Lindbohm JV, Ferrie JE. Body-mass index and risk of obesity-related complex multimorbidity: an observational multicohort study. *Lancet Diabetes Endocrinol*. 2022 Apr;10(4):253-263.

face discrimination in employment, education, or marriage. Yet, the general public lacks awareness of the health risks posed by obesity, how to prevent and control weight gain, and how to adequately manage their own health. Traditional notions about obesity in infants and adolescents are especially in urgent need of change.

The rising incidence of obesity and overweight will not only cause a series of social problems but also impose a **long-term burden on China's economy**. A study using data from the 2000-2009 China resident health and nutrition survey found that body weight has a significant impact on how much is spent on personal healthcare. Per capita medical expenditure on obesity-related conditions is calculated at approximately RMB 6.18 per medical event, accounting for 5.29 percent of the total personal medical expenditure. Nationwide, the annual medical and health expenditure on obesity-related conditions is RMB 24.35 billion, accounting for 2.46 percent of the total national healthcare expenditure.²¹ In 2010, the direct economic burden caused by overweight and obesity in China accounted for 4.5 percent of the total health expenditure that year.²² Without considering long-term increases in healthcare service and obesity-related indirect costs, the *Lancet* predicted in 2021 that obesity-related medical costs will reach RMB 418 billion in China in 2030, which would account for about 22 percent of the total national health expenditure.²³

4. Assisting with the development of systematic solutions to support top-level policy design of China's obesity prevention and treatment efforts

Based on international research and practice, Chinese nutritionists and health experts have reached a consensus on the complexity and severity of the challenges associated with being overweight and obese.²⁴ The current challenge China faces is closely associated with its unprecedented economic and technological development since its reform and opening up, which have created a variety of social and lifestyle changes, particularly regarding nutrition. Beyond individual choices and new lifestyle options, national genetic factors are also having a strong impact on obesity. Given the severity of the issue in China, it is urgent for China to strengthen its top-level policymaking in relevant fields and comprehensively improve systematic planning on all levels, from macro decision-making to meso-level cross-industry

²¹ Qin X, Pan J. The Medical Cost Attributable to Obesity and Overweight in China: Estimation Based on Longitudinal Surveys. *Health Econ.* 2016 Oct;25(10):1291-311.

²² Guangming Daily, Obesity Prevention and Control is Urgent, May 31, 2021.

https://epaper.gmw.cn/gmrb/html/2021-05/31/nw.D110000gmr_20210531_6-02.htm

²³ Wang, Youfa et al. Health policy and public health implications of obesity in China. *Lancet Diabetes & Endocrinology*, Volume 9, Issue 7, 446 – 461.

²⁴ Pan X-F, Wang L, Pan A. Obesity in China 2. Epidemiology and determinants of obesity in China. *Lancet Diabetes & Endocrinology* 2021; 9: 373-392

policy system establishment and implementation. In this manner, China can best strengthen holistic prevention and control and mobilize all sectors of society to jointly deal with the challenges of the overweight and obesity epidemic.

4.1 Macro-Level Strategy: Obesity should be included in the national health plan as an independent disease, top-level design should be strengthened, and a special coordination mechanism should be established.

Obesity should be officially recognized as an independent chronic disease and included as one of the actions in the *Healthy China Action Plan* and China's *Medium-to-Long Term Plan for the Prevention and Treatment of Chronic Diseases*. In addition, a special leadership coordination mechanism for obesity prevention and control should be established under the Healthy China Action Promotion Committee to coordinate cross-industry policy formulation.

Obesity was firstly recognized by the WHO as a chronic disease in 1997.²⁵ Subsequently, several medical organizations, such as the American Medical Association (AMA) and the European Association for the Study of Obesity (EASO), as well as countries including Italy in 2019, recognized obesity as an independent disease. In March 2021, the European Union (EU) recognized obesity as an independent disease and defined it as, “a chronic relapsing disease which in turn acts as a gateway to a range of other noncommunicable diseases (NCD),” providing a basis for obesity to be recognized as an independent NCD within the EU.²⁶

Based on the severe situation of the obesity epidemic, many governments including the UK and Italy have launched special obesity plans at a national level. In 2021, the UK government announced a new special funding scheme to invest GBP 100 million to support obese patients in achieving and maintaining a healthy weight. Additionally, after multiple rounds of multilateral consultations, the WHO published its Action Plan in April 2022, recommending that member states accelerate the establishment of obesity prevention programs, as well as elevate them to a national strategic priority.²⁷

²⁵ Obesity : Preventing and managing the global epidemic: Report of a WHO Consultation on Obesity, Geneva, 3-5 June 1997 <https://apps.who.int/iris/handle/10665/63854>

²⁶ Health Promotion and Disease Prevention Knowledge Gateway

https://knowledge4policy.ec.europa.eu/health-promotion-knowledge-gateway/obesity_en

²⁷ Acceleration Plan to Support Member States in Implementing the Recommendations for the Prevention and Management of Obesity over the Life Course https://apps.who.int/gb/ebwha/pdf_files/WHA75/A75_10Add6-en.pdf

The recognition of obesity as an independent disease and the establishment of a special coordination mechanism at the State-Council level will help implement various prevention and treatment programs, particularly within the medical and non-medical fields at a meso-level, helping to solve the crux of obesity as well as contributing to China's sustainable development.

4.2 Meso-Level: Establish an inter-industry, holistic, full life-cycle obesity prevention and treatment policy system for all age groups and in all aspects, covering the entire population.

Establish the concept of “Big Health, Big Healthcare”, and under the guidance of the government, set up relevant interdisciplinary expert committees for building a comprehensive full life-cycle obesity prevention and treatment system that spans different industries, serves the entire population, and covers health promotion, prevention, diagnosis, treatment, and health management. Government bodies at all levels should increase the allocation of funds and other resources for such programs.

In non-medical fields, it is recommended to accelerate the implementation of a range of evidence-based interventions and improve relevant policy and legal systems, with measures including carrying out effective tax policies for sugary drinks, enhancing food marketing management and nutrition labeling, and encouraging green and healthy food development with greater accessibility. It is further suggested that government agencies and NGOs work closely together to rethink and re-design the urban environment, improve public sports facilities, and increase the construction of fitness trails, riding lanes, sports parks, and multifunctional sports venues, to create a positive atmosphere for national fitness.

In the medical field, it is suggested to promote the development and improvement of the obesity prevention and treatment policy system through the following measures at the implementation level.

4.3 At the implementation level: Integrate the full-cycle management of obesity prevention and treatment into the existing healthcare system, enable the build-up of specialized diagnosis and treatment capacities for obesity, and strengthen the monitoring and information collection of interdisciplinary disease burden and related research.

4.3.1 Integrate health promotion, prevention, diagnosis, treatment, and management of obesity into the existing healthcare policy implementation system to improve its coverage and effectiveness.

- **Health Promotion**

From the publicity perspective, around **World Obesity Day** on March 4 and **World Obesity Prevention and Control Day** on May 11, the government should hold a high-level conference on overweight and obesity prevention and control. Top officials should declare a “war” on obesity to mobilize the entire society toward the goal of obesity prevention and control while coordinating various social forces including healthcare, nutrition, education, and others to participate in the campaign. Government bodies at all levels should increase investments and their overall efforts. To build a broad society-wide consensus on this issue, **National Healthy Lifestyle Day** on September 1 should be used as an opportunity to promote national awareness of overweight and obesity prevention and control. Such efforts should be integrated into the *Special Action for “Three Reductions and Three Healths”*^{*} and the *Special Action for Appropriate Exercise*, in concert with the deployment of digital technologies platforms to carry out health promotion and education activities related to overweight and obesity prevention and control.

From the implementation perspective, based on the current **National Healthy Lifestyle Campaign**, it is suggested to further strengthen the creation of supportive measures such as “Health Stations” and “Health Cabins,”^{**} the allocation of measuring equipment for height, weight, waist circumference, and BMI, as well as health consultation and personalized guidance in the 97 percent of counties covered by the campaign. Meanwhile, information technology (IT) development should be accelerated to strengthen weight-related data collection, and longitudinal research.

At the city level, combining with the “Healthy City” initiative conducted by the Office of the National Patriotic Health Campaign Committee, healthy weight and obesity prevention and management should be included as top priorities of the first batch of pilot cities, while overweight and obesity-related risk factors and indexes should be introduced into the “*National Healthy City Evaluation System*” more comprehensively. Based on the “*National Physical Fitness Measurement Standard*,” overweight and obese people should be targeted for health promotion and education. It is further suggested that local governments in good fiscal standing should create financial incentive mechanisms for weight management.

- **Prevention**

^{*} Targeting a reduction in salt, oil, and sugar, and improvements in oral health, healthy weight, and healthy bones.

^{**} Facilities through which health information is distributed and equipment located. These efforts aim to change the built environment to facilitate exercise, promote behavior changes, and distribute health information

The "*Healthy China 2030 Outline*" provided general requirements for strengthening the **integration of sports and medicine** and non-medical health interventions. The *National Fitness Plan (2021-2025)* required the promotion of **integrating sports and healthcare** and the establishment of a health promotion campaign featuring coordination between sports and health departments, as well as with the participation from the whole society. The *National Fitness Plan* also called to create scientific fitness clinics in health facilities at the primary care level and to promote exercise intervention for chronic diseases. Since 2017, Shanghai and Wenzhou have provided citizens with medical health checkup reports as well as national physical fitness monitoring reports, issuing prescriptions for medicine and directions for exercise when called for. It is suggested that the government further promote a relevant pilot, especially one keeping with the Shanghai and Wenzhou model, then fully include the fitness health test into the scope of national physical examination as an important method for obesity prevention and early intervention. At the same time, it is recommended that sports and health-related government departments should coordinate the research and formulation of indicators related to overweight and obesity and prescription formulation to improve the effectiveness of related pilot projects.

- **Diagnosis**

The central government has repeatedly encouraged the development of **physical examination centers** and promoted them to become important platforms for disease prevention and diagnosis. The *Healthy China 2030 Planning Outline* proposed to accelerate cross-field cooperation between commercial insurance companies and medical and physical examination institutions. The *Healthy China Action Plan* requires that the national physical fitness test be included in the **physical examination**. China's *Medium-to-Long Term Plan for the Prevention and Treatment of Chronic Diseases* emphasized improving and promoting the physical examination system for students and the elderly as well as boosting screening for multiple chronic diseases.

However, as of 2020, only around 30 percent of the total population participates in health examinations²⁸, which is a figure far lower than in most developed countries.²⁹ It is suggested that the government formulate a regular physical examination system for healthy, middle-aged, and elderly population groups, as

²⁸ National Health Commission "2020 China Health Statistics Yearbook"
<http://www.nhc.gov.cn/mohwsbwstjxxzx/tjtjn/202112/dcd39654d66c4e6abf4d7b1389becd01/files/7325fee02bf84676a15ebcfa827c9cd5.pdf> P120. The Indicator in the Yearbook regarding annual amount of health checkups done in hospitals is regarded as physical examinations done that year.

²⁹ Open Medical and Healthcare Alliance: China's physical Examination Industry Report
<https://www.omaha.org.cn/index.php?g=&m=article&a=index&id=137&cid=12>

well as free physical examination for key obese populations, then have it integrated into the physical fitness test initiative. At the same time, it is recommended that the government encourage physical examination centers to cooperate with public and private medical institutions to provide referral services for obese patients in real need of further consultation and treatment.

- **Treatment and Health Management**

The National Metabolic Management Center (MMC) was initiated by Professor Ning Guang, an academician of the Chinese Academy of Engineering. The Center aims to develop a full-cycle management model for diabetes, obesity, and other metabolic diseases. MMC has now expanded at county and town levels, promoting the development of specialized capacities such as obesity diagnosis and treatment clinics and chronic disease management centers. MMC's full-cycle management model, which aims for early diagnosis, prevention, and treatment, provides an important model for the treatment and management of obesity, typically as a metabolic disease closely associated with diabetes. Therefore, it is recommended that the government further promote the MMC model to provide treatment and health management for individuals with obesity, while spurring the development of specialized capacities for diagnosis and treatment.

Additionally, following the Peking Union Medical College Hospital model, medical institutions from multiple provinces have set up multidisciplinary teams for obesity diagnosis and treatment, developing integrated multidisciplinary centers. Although it comes with various advantages, including higher efficiency in clinical resource utilization, the multidisciplinary obesity model remains in an early stage of development in China, lacking supporting measures and regulations.³⁰ Thus, it is recommended that the government improve related supplementary regulations and promote their further development and implementation while coordinating with **the National Health Commission (NHC)'s recent initiative to develop the endocrine and metabolic national medical centers, regional hubs, and subgroups.**

- **Comprehensive disease policy platforms covering full-cycle disease management**

It is recommended to make utmost use of current comprehensive policy platforms on chronic disease prevention and treatment and primary healthcare management, which have been set up by NHC with primary care in mind and have extensive

³⁰ Situations and Future Development of Multi-disciplinary Care in Tier-3 Hospitals <https://www.cn-healthcare.com/article/20210623/content-556458.html>

coverage. These platforms are well-positioned to carry out obesity full-cycle management services pilot work.

As for the NHC's chronic disease prevention and management policy platforms, considering the impact of overweight and obesity on cardiovascular and cerebrovascular diseases, it is recommended to include the monitoring and full-cycle management of weight indicators in the **"Three Highs" Co-management Project** (covering hypertension, hyperglycemia, and hyperlipidemia) led by the National Cardiovascular Disease Center. This project could improve the professional knowledge of primary care medical staffs regarding obesity prevention and management in covered areas, as well as standardize patient data management. In addition, considering that being overweight and obese are risk factors for chronic diseases such as diabetes and cancer, it is recommended to include the screening and full-cycle management of weight indicators within the work scope of the **National Demonstration Areas for Comprehensive Prevention and Control of NCDs**. Also, it is suggested to provide relevant services for obese patients with poor outcomes after lifestyle intervention, while overweight patients with other complications should be referred to higher-level medical institutions.

On the NHC primary healthcare management policy platforms, based on WHO's *Acceleration Plan*, in view of the impact of overweight and obesity on national full life-cycle health and economic development, it is recommended to include the full-cycle management of obesity into the scope of **Essential Public Health Services** and to organize clinical and policy experts to jointly develop the *National Guidelines for the Prevention, Treatment and Management of Obesity in Primary Care*. In addition, **Family Doctor Contract Services** should be taken as the driving force to establish health records of residents' weight indicators, conduct public health education on weight management, and provide relevant services for obese patients with poor lifestyle intervention effects and overweight patients with other complications to refer to higher-level medical institutions. Also, it is suggested that control of the overweight and obesity ratio should be included in the evaluation and assessment system of the **National Primary Health Comprehensive Pilot Zone**, and training related to the diagnosis and treatment of obesity should be reinforced for primary care medical staff in order to accumulate practical obesity management experience at the primary care level.

4.3.2 Improve the formulation of obesity diagnosis and treatment policies, and enable capacity building for obesity diagnosis and treatment.

Since the first comprehensive document, the *Guidelines For Prevention and Control of Overweight and Obesity in Chinese Adults (Trial)*, was released in 2003, more than ten important documents with relevant guidelines and expert consensuses

have been issued. Although they cover management, nutrition, treatment, and other areas, the various guidelines documents have been drawn up by expert groups from different fields, with divergent recommendations for different treatments. The recommendations tend to focus more on conveying international treatment principles while lacking recognition and coordination at the government level. It is suggested that competent health authorities should lead and organize clinical and policy experts in the field of endocrinology and obesity to jointly discuss and formulate obesity clinical treatment guidelines, diagnosis and treatment pathways, and plan for tiered diagnosis and treatment services and technologies, as well as other related policies. In addition, given the window of opportunity of building an obesity/metabolic syndrome subgroup in national medical centers and regional medical hubs for endocrinology and metabolic diseases, the clinical application and promotion of obesity diagnosis and treatment policies should be explored, to enable the development and capacity building of the interdisciplinary diagnosis and treatment model for obesity.

4.3.3 Strengthen monitoring, information collection, and related research regarding the burden of obesity and its associated diseases.

Based on current health and physical monitoring systems, it is suggested to improve the full life-cycle weight management monitoring system, diversify obesity-related risk factors, increase the frequency of national surveys, and strengthen the monitoring of key populations including pregnant women, children under three years old, and others. Information sharing should also be encouraged to break down information silos among various public databases and health information datasets for developing basic data platforms and applications. Healthy weight research should also be comprehensively promoted to best promote the improvement of national and local policies and regulations.

5. Closing Remarks

As China has begun to take steps regarding its obesity prevention and control work under the current NCDs system, it is crucial for the government, experts, academia, enterprises, society, and other parties to join forces and make concerted efforts to further improve related top-level policies and implementation plans. Founded in Denmark in 1923, Novo Nordisk is a leading global biopharmaceutical company focused on the prevention and eventual cure of serious chronic diseases, such as diabetes and obesity, through its leading technological breakthroughs and expanding access to medicine. As 2023 marks the 100th anniversary of Novo Nordisk's founding, we are planning ahead to suitably commemorate the occasion. With resources in 80 countries and regions and product and management expertise in more than 170 markets, Novo Nordisk will continue to deepen our cooperation

with the Chinese governments in the future. We will actively share international experience in obesity prevention and treatment and provide support for relevant public-private cooperation projects, and ultimately contributing to the realization of the *Healthy China 2030* objectives.