

# Current Status of Diabetes Prevention and Control in China and Early-Stage Intervention Strategies

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**Abstract:** In recent years, the prevalence of diabetes in China has continued to rise, with the adult prevalence expected to reach 12.8% by 2023. To control this trend, the government has introduced several policies and invested substantial funds in the prevention and treatment of diabetes, achieving certain results. Prediabetes is a stage where blood glucose metabolism can still be restored. For individuals in this stage, dietary and exercise intervention programs are recommended to prevent or delay the onset of diabetes, improve quality of life, and reduce the burden of disease on individuals, families, and society.

**Keywords:** Prediabetes; Dietary intervention; Exercise interventions

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## 1. Introduction

Diabetes mellitus is a common chronic disease primarily characterized by hyperglycemia caused by insufficient insulin secretion or insulin resistance. Its pathogenesis is not fully understood but is mostly related to genetics, lifestyle, and other factors <sup>[1]</sup>. Currently, there is no cure for diabetes; patients must take oral medications or insulin injections to control blood sugar. Improper drug or insulin dosages, an unbalanced diet, inappropriate exercise, or unscientific exercise methods, as well as excessive physical exertion, can cause blood sugar fluctuations. Extremely low blood sugar can damage the central nervous system and even lead to cardiovascular and cerebrovascular diseases. Prolonged high blood sugar can cause skin diseases, neuropathy, foot diseases, retinopathy, kidney disease, heart disease, and other serious complications that may endanger the patient's life.

Prediabetes refers to a stage of abnormal blood glucose metabolism that lies between the normal range and diabetes <sup>[2]</sup>. Individuals at this stage show a slight increase in blood glucose levels but do not yet meet the diagnostic criteria for diabetes. Statistical results indicate that if individuals with prediabetes do not strengthen

blood sugar control, they will develop diabetes over time. Numerous studies have shown that establishing a healthy lifestyle and maintaining blood sugar within a reasonable range during the prediabetes stage can delay or even prevent the onset of diabetes [3]. Therefore, prediabetes is a crucial stage for diabetes prevention and control.

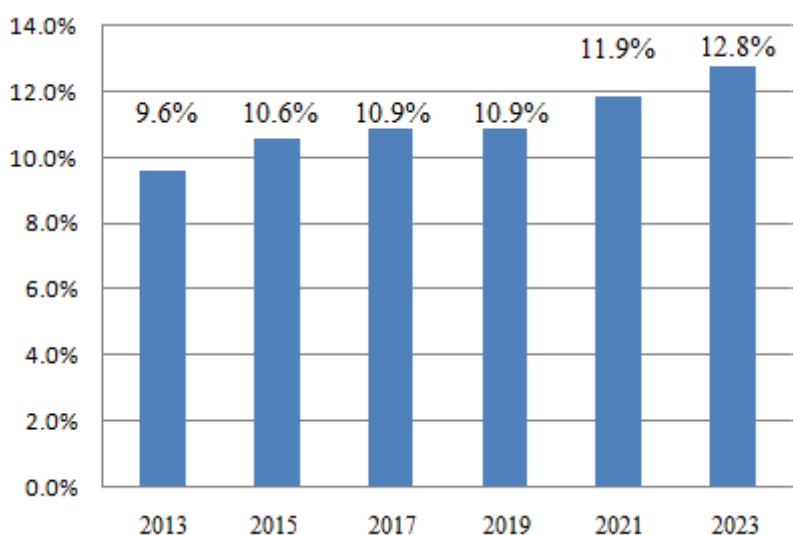
## 2. Current development trends and prevention and control measures of diabetes in China

### 2.1. Development trends

Since the reform and opening up, China's economic development has achieved great success, greatly improving the material living standards of the people, and providing a wider variety of dietary options. However, some individuals lack awareness of health management, leading to more casual dietary structures, overeating, and excessive consumption of sugar, fat, and salt, combined with a lack of physical activity. According to research by relevant scholars, approximately 600 million adults in China are currently overweight, with an obesity rate of about 50% within the corresponding population [4]. Among the obese population, many exhibit symptoms of the "three highs" (high blood sugar, high blood pressure, and high cholesterol), and there are numerous potential patients who may develop diabetes [5].

With the continued improvement in material and cultural living standards, as well as advancements in medical and health services, the aging of the population has intensified, resulting in a rise in the number of patients with age-related and chronic diseases. According to relevant statistics, the number of adults with type 2 diabetes in China has increased in recent years, as shown in **Figure 1**. As indicated by **Figure 1**, the growth rate of type 2 diabetes patients in China has been significant, increasing from 98 million in 2013 to 125 million in 2023, with a projected rise to 127 million in 2024. This trend places considerable pressure on patients, families, and society as a whole.

China also has a large population of individuals with pre-diabetes, with more than 100 million people estimated to currently have unstable blood sugar levels [6]. Studies show that 5%–10% of individuals with pre-diabetes develop diabetes each year, and without intervention, approximately 70% will eventually progress to diabetes [7].



**Figure 1.** The prevalence rate of adult diabetes in China from 2013 to 2023 shows a discouraging trend in diabetes

## 2.2. Prevention and control measures

To control the development of diabetes, China has introduced relevant diabetes prevention and control policies since 1995, promoting a “prevention first” approach. In 2008, the National Health and Family Planning Commission issued the “Key Points of Diabetes Prevention and Control Publicity Knowledge,” providing guidance for diabetes prevention, control, and related knowledge dissemination <sup>[8]</sup>. In 2012, the Ministry of Health led 15 departments in jointly issuing the “China Chronic Disease Prevention and Control Work Plan (2012–2015),” which was the first national plan for the comprehensive prevention and control of chronic diseases formulated by the Chinese government. It set the direction for chronic disease prevention and control during the 12th Five-Year Plan period, making it a significant milestone in the fight against chronic diseases <sup>[9]</sup>.

Since 2003, China has issued seven editions of the programmatic document for diabetes prevention and control—the National Guidelines for Grassroots Diabetes Prevention and Control Management—to guide diabetic patients and pre-diabetic individuals in the prevention and treatment of diabetes. The 2022 edition of the guidelines included a chapter on the prevention and treatment of traditional Chinese medicine, clarifying its efficacy in coordinating blood sugar control, improving symptoms, and preventing and treating complications, thereby providing a new approach to diabetes prevention and treatment <sup>[10]</sup>.

In 2017, the State Council issued the Medium and Long-term Plan for the Prevention and Treatment of Chronic Diseases in China (2017–2025), which outlined the work priorities for chronic disease prevention and treatment based on the country’s evolving disease trends. It also made comprehensive plans and deployments for the prevention and treatment of diabetes <sup>[11]</sup>. The Expert Consensus on Adult Prediabetes Intervention in China (2023 edition), published in 2023, provided specific guidance on prevention and control methods for individuals with prediabetes. In general, China’s diabetes prevention and control policies have become increasingly comprehensive and detailed, and their targeted and guiding effects have continued to improve.

To improve the level of medical and health services and make it easier for patients to access medical care, the government has repeatedly introduced policies to integrate medical and health resources. In 1997, the state issued the Decision of the Central Committee of the Communist Party of China and The State Council on Health Reform and Development, which explicitly called for the reform of the health service system and the active development of community health services <sup>[12]</sup>. In 2002, 10 ministries and commissions, led by the Ministry of Health, jointly issued the Opinions on Accelerating the Development of Urban Community Health Services, which clearly outlined the requirements for improving the level of community medical and health services <sup>[13]</sup>.

In recent years, several documents have been issued to guide the construction of the community health service system. Under the government’s macro-control, the community medical and health service system has developed rapidly, establishing a medical and health service network that covers all residents within communities, significantly improving the level of medical and health services. Community health service departments have created patient records for those with chronic diseases within their jurisdictions, conducted regular follow-ups, and provided effective health management guidance. These efforts have greatly improved the ability to treat and prevent diabetes. After years of development, China has established a three-tier diabetes treatment, prevention, and control system consisting of “hospital - community health service department - family,” which has enhanced the knowledge and ability of pre-diabetic individuals and diabetes patients regarding prevention and control. With active participation from the whole society, diabetes prevention and control efforts have achieved certain successes.

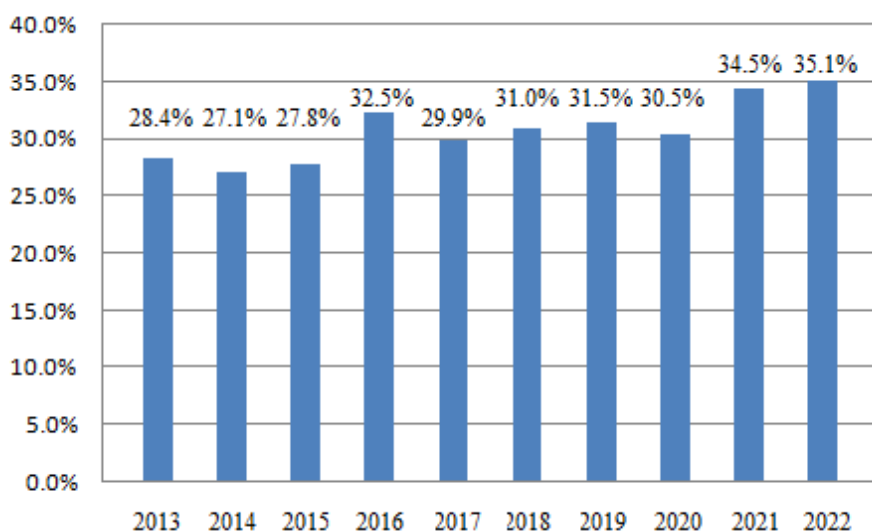
As the number of people with diabetes increases, so too does the number of diabetes-related deaths. In 2021, approximately 830,000 people in China died from diabetes. Despite the high fatality rate, the rates of disease awareness, treatment, and blood sugar control among diabetic patients in China remain low. In 2023, the disease awareness rate, treatment rate, and blood sugar control compliance rate among diabetes patients were only around one-third, indicating that the diabetes prevention and control situation is far from optimistic.

### 3. Study on prevention and control strategies of prediabetes

Diet and lifestyle play an important role in controlling blood sugar levels. A scientific diet and healthy lifestyle can effectively prevent or delay the onset of diabetes and even reverse blood sugar levels to a normal state <sup>[14]</sup>. However, due to weak awareness and a lack of knowledge about prevention and control, most pre-diabetic individuals do not realize the importance of diabetes prevention and control and lack the subjective awareness to take preventive action. Therefore, it is necessary to intervene in the lifestyle of pre-diabetic individuals <sup>[15]</sup>.

#### 3.1. Improve awareness of prevention and control and strengthen health management

Pre-diabetic individuals should place more emphasis on diabetes prevention and control, become more aware of their health status through regular check-ups, and address any weak areas of their health with targeted management. In recent years, excluding the impact of special factors like the epidemic, the number of health check-ups in China has stabilized at over 30% and is on the rise, as shown in **Figure 2**. The level of medical and health services has made great progress, significantly increasing the coverage of health examinations.



**Figure 2.** National health examination rate from 2013 to 2022

According to surveys of the pre-diabetic population, although this group requires regular monitoring of their health conditions, many individuals neglect routine check-ups. Some have never undergone a health examination and are unaware of their physical condition until they experience symptoms such as “three more and one less” (increased urination, increased thirst, increased hunger, and weight loss). By then, they may have missed the optimal time for diabetes prevention and control. Therefore, it is crucial for individuals to improve

their awareness of health management, undergo regular check-ups, monitor their blood sugar levels, and, if necessary, seek guidance from healthcare professionals for better health management.

## **3.2. Master prevention and control knowledge and strengthen life management**

### **3.2.1. Scientific diet**

Pre-diabetic individuals should aim to have three fixed meals per day at regular intervals, with controlled portion sizes to avoid overeating. A regular eating schedule helps reduce blood sugar fluctuations, while a well-balanced diet ensures proper nutrient intake. Studies have shown that the “Mediterranean diet” plays a significant role in preventing type 2 diabetes. This diet emphasizes consuming ample vegetables, grains, soy products, and nuts while meeting energy needs. It also advocates moderate consumption of dairy and meat products, particularly fish, with limited intake of sweets, eggs, and other meats. Olive oil is the preferred cooking oil, and moderate red wine consumption is encouraged <sup>[16]</sup>.

Pre-diabetic individuals can adopt aspects of this plan but should consider factors such as their regional, ethnic, and dietary habits. When creating a daily meal plan, they must account for nutrient intake—such as carbohydrates, proteins, vitamins, and minerals—while regularly monitoring blood sugar levels. The intake of carbohydrates at each meal should be adjusted based on changes in physical activity, exercise, and blood sugar levels to determine the most suitable diet. Notably, carbohydrates like grains and rice are essential for providing the body with energy, but due to their high sugar content, they must be consumed in moderation to avoid spikes in blood sugar. Conversely, reducing intake excessively may lead to hypoglycemia and place stress on organs like the liver.

### **3.2.2. Moderate exercise**

A significant amount of research and practice has demonstrated that moderate exercise plays a crucial role in lowering blood sugar levels and preventing diabetes <sup>[17]</sup>. Pre-diabetic individuals, depending on their physical condition, can start with aerobic exercises such as slow walking and gradually increase the intensity. Over time, as the body adapts to low-intensity activities, younger and more physically capable individuals can transition to brisk walking, jogging, swimming, or playing non-competitive sports. Older individuals or those with lower physical capacity can continue with slow walking or switch to exercises like tai chi.

Ultimately, the type, intensity, and duration of exercise should be tailored to individual physical conditions, and consistency is key to achieving stable blood sugar control. Exercise should ideally begin 0.5 hours after meals to prevent overloading the digestive system while reducing post-meal blood sugar peaks to stabilize overall blood sugar levels. The amount and duration of exercise should be moderate to avoid hypoglycemia.

## **4. Conclusion**

Diabetes prevention and control is a systematic, meticulous, and long-term effort. Pre-diabetic individuals must place greater emphasis on diabetes prevention and control, acquire relevant knowledge, maintain a cheerful and optimistic attitude, and face the situation proactively. It is essential to establish healthy living habits—“control what goes into your mouth, and keep your legs moving.” A scientific diet and strict control over food intake are crucial to managing blood sugar fluctuations. Engaging in moderate exercise helps enhance physical fitness and strengthens the body’s ability to resist disease. Preventing and controlling diabetes is not a task that can be

accomplished overnight; persistence is key to preventing or delaying the onset of diabetes, improving quality of life, and reducing the burden of the disease on individuals, families, and society.

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## Disclosure statement

The authors declare no conflict of interest.

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