



Preventing Cardiovascular Disease to support *Healthy China 2030* goals and promote economic development in China

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Executive Summary

The China Development Forum is an important platform that enables the Chinese government, global business leaders, and scholars to engage in meaningful discussions, and Novartis is honored to participate each year in this valuable assembly. This year's theme, "China on a New Journey of Modernisation," highlights the opportunities at hand in 2021 as the country enters the first year of its 14th Five-Year Plan amid rapidly changing technologies and social and economic landscapes. Novartis is heartened that the plan highlights health as a critical element and supports the continuation of the *Healthy China 2030* initiative.

Healthy China 2030 is an important policy framework that strives to prevent disease and promote improved health. The initiative is particularly relevant to cardiovascular disease (CVD), which remains the leading cause of death globally, as well as in China. Worldwide in 2019, CVD was the underlying cause of 9.6 million deaths among men and 8.9 million deaths among women, together around a third of all deaths. The highest number of CVD deaths occurred in China, followed by India, Russia, the United States, and Indonesia¹.

CVD is linked to many risk indicators. These include behavioral factors, such as smoking and obesity, as well as other health related conditions such as hyperlipidemia, hypertension, and aging. CVD incidence can be reduced and many cardiovascular events and fatalities prevented by addressing these factors using a holistic management approach driven by population-wide strategies. For example, people with CVD or who are at high risk need early detection and management using counselling and treatments.

In addition to the human cost, the country's high CVD burden also carries a significant economic price. In China, total medical expenditure for CVD in 2017 was RMB 540 billion², just more than 10% of China's total expenditure on health and equal to about 0.7% of national GDP.

Over the past 30 years, the Chinese government has taken targeted measures to reduce, prevent, and control chronic disease. While great progress in monitoring risk factors and improving public awareness is noticeable, CVD related incidence and mortality remain high. The reasons are multifaceted and complex, and contributing factors include the absence of comprehensive CVD treatment, frequent late diagnosis, and a disparate adherence to available treatment guidelines and preventative measures.

Novartis is committed to working with policy makers and healthcare professionals to improve and advance heart health around the world. In this light, we would like to contribute our experience and expertise in the field of CVD to China's efforts and propose to the Chinese government to take the following steps in the hope of helping improve cardiovascular health in China:

(1) Establish policies with key performance indicators (KPIs) to effectively address the CVD burden

The Chinese government is proposed to fully embrace the *Health in All Policies* concept connected to defined KPIs to drive effectively control and prevention of CVD.

(2) Explore innovative partnership models to improve CVD management

The establishment of multi-sectoral partnerships will help to raise capabilities in CVD management and allow improved access to treatment.

(3) Elevate CVD management capabilities at the primary care level

Special government attention to rural primary care will support improved CVD management and prevent health-related poverty in rural areas.

Novartis believes there is substantial opportunity to address the growing medical and economic threat caused by CVD through multi-sectoral partnerships that focus on holistic treatment concepts and prevention. We welcome the opportunity to contribute to and support the Chinese government's effort toward the goals of *Healthy China 2030*.

¹Cardiovascular Disease Burden, Deaths Are Rising Around the World, The Journal of the American College of Cardiology, Dec 2020; <https://www.acc.org/about-acc/press-releases/2020/12/09/18/30/cvd-burden-and-deaths-rising-around-the-world>

²Zhang YH. Chai PP. Zhai TM. Wan Q. Accounting and Analysis of China CVD Medical Cost in 2017. China Health Economics. 2020, 54 (9):859-865

1. Introduction

In the upcoming Five-Year-Plan period, the Chinese government will continue to advance the Healthy China 2030 initiative that focuses on managed care, strengthening the early response system to health threats, and preventing disease. Important initiatives targeted in Healthy China 2030 include improving health, controlling major risk factors, and increasing and improving the capacity and quality of health service provision.

These targets are critical in the area of cardiovascular disease (CVD), a major health issue in China. In China and elsewhere in 2019, CVD was the leading cause of death, responsible for 32% of all deaths in the United States, 30% in the United Kingdom, and 43% in China³.

CVD is a general term for a group of disorders of the heart and blood vessels. These disorders have many independent risk factors and lead to severe and costly outcomes such as heart attacks, strokes, heart failure, and death. Some of the risk factors leading to CVD are attributed to behaviors that can be modified or genetic conditions. Behavioral risk factors include tobacco use, unhealthy diet, lack of exercise, and excessive alcohol consumption. Medical risk factors, which are often triggered by unhealthy behavior, include obesity, hypertension, diabetes, and hyperlipidemia. These factors are widely understood to contribute to deaths, morbidity, and overall costs associated with CVD. As CVD is more prevalent in older people⁴, aging population trends in many countries, including China, are likely to contribute to an increasing disease burden. World demographic trends have led the United Nations, the World Health Organization (WHO), and other international institutions to recognize CVD as a global problem, requiring a comprehensive approach to manage the impact of aging populations and rising healthcare costs.

In addition to being a public health issue, CVD is also a major social and economic burden. The World Economic Forum (WEF) estimates that in 2015 CVD generated a global cost of USD 906 billion and the annual cost was forecast to surpass USD 1 trillion in 2025⁵. Poor health has a microeconomic impact affecting households and companies, as well as an aggregate macroeconomic effect that burdens a country's current and future gross domestic product (GDP). This aggregate impact can be calculated quantitatively and shows the significant economic opportunity available with successful progress toward CVD prevention.

Urgent action is needed to identify at-risk patients before symptoms arise and provide them with adequate intervention, including care and advice. Such action is critical to prevent CVD effectively, improving overall health and mitigating harm at the micro- and macro-economic levels.

Aligned with the *Healthy China 2030* initiative and related action plan, a clear focus on promoting public health and disease prevention represents a strategic shift from disease treatment to the holistic management and maintenance of individual health. The effort faces a crucial challenge: effective measures for preventing disease are difficult to implement in health systems today because these systems are mainly reactive and treat patients who are already sick. Most healthcare systems lack alignment amongst the relevant stakeholders on goals or incentives to foster prevention.

Novartis supports partnerships between governments and other relevant healthcare stakeholders, including industry, to develop tailored programs focused in the general population and believes this represents a promising approach to address the high disease burden of CVD that is both treatable and preventable.

2. Situational analysis in China and other countries

2.1 Global situation

2.1.1 Alarming numbers of CVD deaths illustrate high disease burden and economic risk

Disease burden

For the past 30 years, non-communicable diseases (NCDs) – and particularly CVD – have been recognized as the leading cause of premature death globally. Over almost three decades worldwide,

³ Institute of Health Metrics and Evaluation, <https://vizhub.healthdata.org/gbd-compare/>

⁴ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3297980/>

⁵ World Economic Forum. The Global Economic Burden of Non-communicable Diseases, page 22; <https://www.weforum.org/reports/global-economic-burden-non-communicable-diseases>

cases of CVD nearly doubled from 271 million in 1990 to 523 million in 2019. Over the same period the number of CVD deaths rose steadily from 12.1 million to 18.6 million⁶.

Faced with such alarming figures, all 194 member states of the WHO agreed in 2013 on global mechanisms to reduce the avoidable NCD burden under a "Global action plan for the prevention and control of NCDs 2013-2020"⁷. The plan aimed to reduce the number of premature deaths caused by NCDs by 25% by 2025 through nine voluntary global targets, including two that focused on preventing and controlling CVD. The global plan includes the need for setting up strategies to address behavioral risk factors, as well as medical-related actions that support the creation of and adherence to CVD guidelines, and providing access to essential medicines and technologies.

In 2018, however, the third high-level meeting on NCDs of the UN General Assembly concluded that many countries were behind in their efforts to achieve the voluntary global targets by 2025⁸ (Figure 1). Indeed, after years of decline, the incidence of CVD-related deaths has grown since 2017 in the United Kingdom and since 2010 in the United States. In China, the death rate has continually increased since 1990, with the exception of a small downturn in 2006 and 2007.

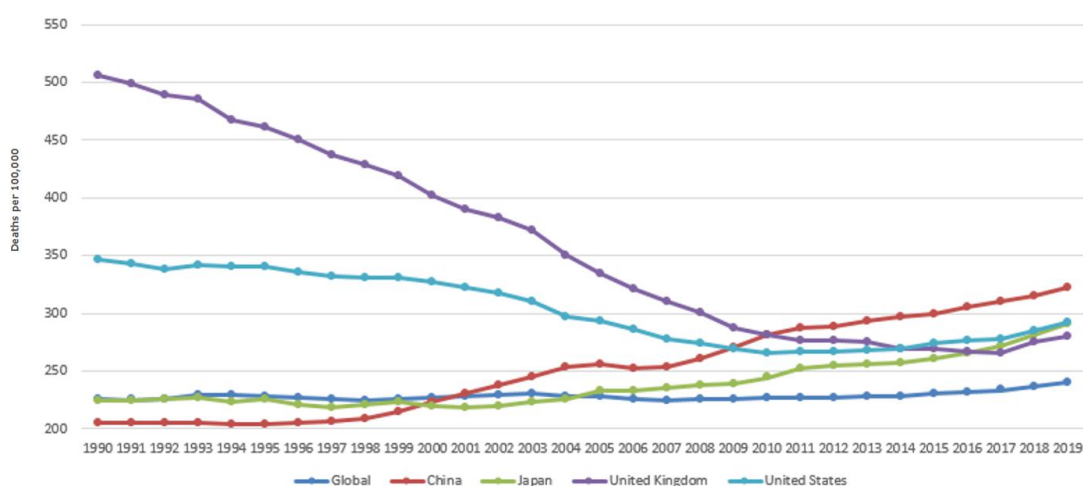


Figure 1: Development of rates of death caused by CVD in selected countries between 1990 and 2019⁹. Source: GBD tool Institute of Health Metrics and Evaluation.

Economic burden

In addition to the substantial personal burden of CVD, these diseases and their treatments carry high economic costs. The global cost of CVD in 2010 was estimated at USD 863 billion or an average per capita globally of USD 125, and it was estimated to rise to more than USD 1 trillion in 2030 – an increase of 22%. Overall, the accumulated cost for CVD could be as high as USD 20 trillion over the 20-year period or an average per capita cost globally of nearly USD 3,000. Currently about USD 474 billion or 55% of this burden is due to direct healthcare costs and the remaining 45% to productivity loss from disability, premature death, and time lost from work because of illness or the need to seek care⁴.

In 2017, the European Heart Network estimated the annual impact of CVD on the EU economy to be approximately EUR 210 billion. Of this amount, about 53% or EUR 111 billion were direct health care costs, 26% or EUR 54 billion were attributed to productivity losses, and 21% or EUR 45 billion were costs linked to informal care by family members¹⁰. In the United States, annual direct medical costs associated with CVD are projected to rise to USD 749 billion by 2035, while lost productivity costs could reach USD 368 billion annually¹¹. Together the total cost could reach USD 1.1 trillion a year in the United States.

⁶ Global Burden of Cardiovascular Diseases and Risk Factors, 1990–2019: Update From the GBD 2019 Study, JACC, Volume 76, Issue 25, 22 December 2020, Pages 2982-3021

Journal of the American College of Cardiology

⁷ www.who.int/publications/i/item/9789241506236

⁸ Non-communicable Diseases Country Profiles 2018, WHO report, <https://www.who.int/nmh/publications/ncd-profiles-2018/en>

⁹ <https://vizhub.healthdata.org/gbd-compare/>

¹⁰ CVD Statistics 2017 <http://www.ehnheart.org/cvd-statistics/cvd-statistics-2017.html>

¹¹ Cardiovascular disease: a costly burden for America. Projections through 2035 (2017). American Heart Association; <https://healthmetrics.heart.org/cardiovascular-disease-a-costly-burden/>

2.1.2 Global and national programs to improve control and prevention of CVD

Although incremental progress has been achieved, countries continue to face significant challenges with regard to their efforts to reduce the burden of CVD. These include: a greater prevalence of certain risk factors, such as obesity and diabetes; delays in diagnosing CVD risk factors; unsatisfactory adherence to recommended treatments; aging populations with increasingly complex healthcare needs; and insufficient access to specialized care. Changes in healthcare systems to better prevent, treat, and manage CVD will help to successfully reduce CVD related mortality rates.

Several efforts are underway. In 2020, the UN General Assembly launched the *Decade of Healthy Ageing 2021-2030*¹². This program seeks to bring stakeholders together, including governments, civil societies, international agencies, professionals, academics, the media, and the private sector, in a concerted effort to improve the lives of the elderly, their families, and their communities. The program includes collection and analysis of data on healthy aging from service facilities, addresses gaps in training on health provision for older people and their unique needs in emergencies, and provides coordination of care for older people among service providers. The *Decade* program also provides a platform for stakeholders to promote actions within countries, share information and guidance, and build capabilities. While the program is not specifically centered on CVD, its implementation may help improve early detection and treatment, as well as prevent CVD as a common cause of heart attacks and strokes in the elderly population.

In the United Kingdom in 2018, the National Health Service (NHS) established the *Long-Term Plan*¹³ that identifies – among many other features – CVD as a clinical priority and the condition with the greatest potential to save lives over the next 10 years. The plan seeks to prevent more than 150,000 heart attacks, strokes, and dementia cases over a decade. It outlines how the NHS, its partners in the voluntary and community sectors, and other national organizations, including medical associations, can work to achieve this goal. Specifically, the program targets reducing harmful low-density lipoprotein (LDL) cholesterol as a critical measure to prevent CVD and provides strategies for early detection and treatment of CVD. The program also recognizes working with community pharmacists and general practitioners as a great opportunity to assess patient risk through tests for high blood pressure and other indicators, including genetic ones. The program offers preventative treatments for individuals identified as high risk.

In addition, the UK Life Sciences Industrial Strategy was established to transform the country's healthcare system to identify disease earlier using risk and stratification, a method of categorizing patients and their needs based current health and other factors. In the last few years, the NHS has accelerated approvals of the most promising new medicines and health technologies, partly by expanding the Accelerated Access Collaborative (AAC), a forum established to encourage UK health innovation¹⁴. One goal of the effort is to develop an oligonucleotide manufacturing platform that increases production, reduces cost, and mitigates environmental impact. In January, 2020, Novartis announced it would work with the NHS through a manufacturing consortium to tackle CVD and help the country achieve the goals of the NHS' Long-Term Plan and the Life Sciences Industrial Strategy¹⁵.

In the United States, the Division of Heart Disease and Stroke Prevention, a part of the Centers for Disease Control and Prevention (CDC), has cooperative agreements in place to help control CVD. These programs seek to prevent, manage, and reduce heart disease and stroke with an emphasis on cutting risk factors, reducing health disparities within state, local, and tribal public health departments, and boosting surveillance and implementation research. As part of the five-year cooperative agreement signed in 2018, health departments will use clinical data to improve adherence to treatment guidelines, increasing engagement in self-management and lifestyle changes of patients with hypertension and hypercholesterolemia¹⁶. In 2018, CDC funded state and local health departments to design, test, and evaluate innovative approaches to address the disease burden of diabetes, heart disease, and stroke. The efforts focus on developing new ways to identify patients with high blood pressure and high blood

¹² <https://www.who.int/initiatives/decade-of-healthy-ageing>, <https://www.who.int/docs/default-source/decade-of-healthy-ageing/final-decade-proposal/decade-proposal-final-apr2020-en.pdf>

¹³ <https://www.longtermplan.nhs.uk/online-version/chapter-3-further-progress-on-care-quality-and-outcomes/better-care-for-major-health-conditions/cardiovascular-disease/>

¹⁴ Life Sciences Industrial Strategy Update (publishing.service.gov.uk)

¹⁵ Media Release, Novartis announces intent to collaborate with NHS England to tackle burden of cardiovascular disease in the UK January 13, 2020

¹⁶ <https://www.cdc.gov/dhdsp/programs/spha/overview.htm>

cholesterol, develop community programs, expand telehealth, and enhance referral, participation, and adherence of patients in cardiac rehabilitation programs.

2.2 Situation in China

2.2.1 High numbers of CVD deaths illustrate high disease burden and economic risk

Disease burden

The Chinese Center for Disease Control and Prevention defines NCDs as those with long duration and slow progression and categorizes four main types: CVD, including heart attack and stroke; diabetes, an independent risk factor for CVD; cancers; and chronic respiratory diseases¹⁷.

Echoing the global situation, the prevalence and mortality of CVD in China is increasing. According to the Chinese Cardiovascular Association, in 2019 there were about 330 million CVD patients in China or about one-quarter of the country's population. Compared to other diseases, including malignant tumors, CVD is the leading cause of death in China. In 2017, 46% of all deaths in China's rural areas were linked to CVD and about 43% in urban areas¹⁸.

Among the different types of CVD, atherosclerotic cardiovascular disease (ASCVD), the accumulation of fats, cholesterol, and other substances on artery walls, has been the leading cause of death in China over the past 30 years, with both mortality and incidence increasing (Figures 2a, 2b)¹⁹.

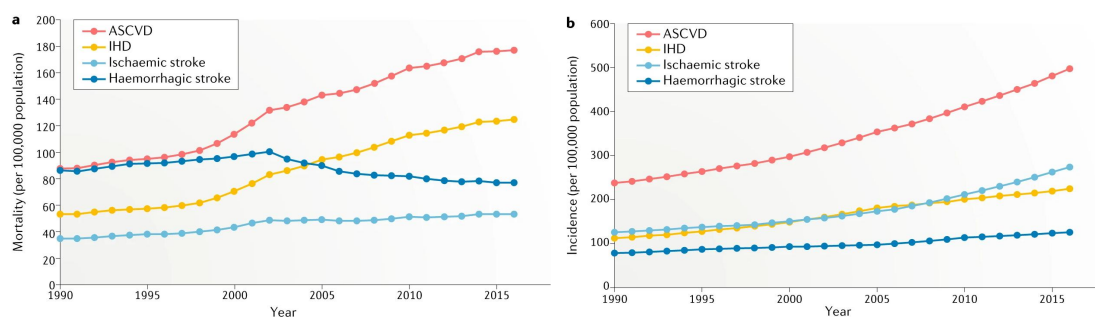


Figure 2: Trends in mortality and incidence of cardiovascular disease in China⁶: a) Mortality from atherosclerotic cardiovascular disease (ASCVD), ischemic heart disease (IHD), ischemic stroke, and hemorrhagic stroke in China. B) Incidence of ASCVD, IHD, ischemic stroke, and hemorrhagic stroke in China. Data were obtained from the open database of the Global Burden of Disease Study in the Global Health Data Exchange by the Institute of Health Metrics and Evaluation, 2018.

Economic and Socioeconomic Burden

The increasing number of CVD cases leads directly to greater expenditures linked to the diseases. Since 2004, the economic cost of CVD in China has risen, on average, faster than the country's GDP, creating an increased burden on resources. Between 2012 and 2016 alone, medical expenditures for CVD grew from RMB 310 billion to RMB 495 billion, an average of 11% a year²⁰. In 2017, the expenditures reached RMB 540 billion and accounted for more than 10% of China's total health expenditures²¹ or about 0.7% of GDP. While the proportion of CVD expenditures to total health spending has decreased, the overall spend has increased significantly. Indeed, costs associated with an aging population are growing faster than the economy, causing additional concern. The China Annual Report on Elderly Health of 2018 estimated that between 2015 and 2050 the total social expenditure in China on elderly care, including medical care, welfare, and facilities, will increase from 7% to 26% of GDP²². A 2016 study estimated that systematic treatment of patients with hypertension and dyslipidemia in China could generate economic value of USD 932 billion over 15 years, from 2016 to 2030, by avoiding millions of CVD deaths²³.

¹⁷ <http://www.chinacdc.cn/jkzt/mxfcrjbhsh/>

¹⁸ Report on Cardiovascular Diseases in China 2019

¹⁹ Zhao, D., Liu, J., Wang, M. et al. Epidemiology of cardiovascular disease in China: current features and implications. *Nat Rev Cardiol* 16, 203–212 (2019). <https://doi.org/10.1038/s41569-018-0119-4>

²⁰ Zhang YH. Chai PP. Zhai TM. Wan Q. Research on China CVD Medical Cost Accounting and Prediction. *China Health Economics*. 2019, 38 (5):18-22

²¹ Zhang YH. Chai PP. Zhai TM. Wan Q. Accounting and Analysis of China CVD Medical Cost in 2017. *China Health Economics*. 2020, 54 (9):859-865

²² Annual Report on Elderly Health in China 2018

²³ Stevens et al. *BMC Health Services Research* (2016) 16:175

2.2.2 Measures and policies to improve prevention and control of CVD

Since the 1990s, China's central government has explored feasibility models and measures to prevent and control chronic diseases, including a community-level pilot program on chronic disease prevention in 1996 and 34 additional pilots in 1997. A more comprehensive initiative for national prevention and control of chronic diseases began in 2010, integrating CVD, hypertension, and diabetes. These measures recorded a number of successes:

- (1) *Risk factor monitoring.* In 2002, China set up a preliminary integrated monitoring system to survey the health of the population across several factors, such as causes of death, number suffering from NCDs and associated risk factors, and nutritional levels²⁴. From 2004 to 2018, five monitoring programs were launched nationwide, bringing in a large amount of epidemiologic data, including information on metabolic, environmental, genetic non-modifiable, and readily modifiable risk factors. The modifiable risk factors included, in descending order of relevance to CVD, hypertension, smoking, dyslipidemia (including high LDL-cholesterol), diabetes, obesity, lack of exercise, and unhealthy diet. These modifiable factors are driving an increase of deaths, morbidity, and costs associated to CVD.
- (2) *Health awareness.* As the surveys were conducted, the health awareness of the population also increased. Knowledge of the dangers of hypertension, for example, rose from 30% of the respondents in 2002 to 52% in 2015. The awareness rate of diabetes of those 18 or older increased from 6% in 2002 to 36% in 2013 and of dyslipidemia from 3% in 2002 to 31% in 2010. From 2010 to 2016, the number of patients with standardized management of hypertension more than doubled from 42.2 million to 90.2 million.
- (3) *Agencies focusing on CVD.* Agencies were established specifically to guide national NCD control and prevention efforts, including the National Center for Chronic and Non-Communicable Disease Control and Prevention and the National Center for Cardiovascular Disease. About half of the provinces also opened offices dedicated to NCD control and prevention. In addition, medical alliances were formed or expanded and centers opened that focused on specific conditions, for instance chest pain or stroke, together contributing to tiered CVD diagnosis and treatment. Since 2017, the central government has worked to develop medical alliances in local regions to enhance tiered diagnosis and treatment and intensify NCD control and prevention at the primary-care level.

In the *Healthy China 2030* blueprint announced in 2016 and the action plan released in 2019, 15 special actions were delineated, including four directly related to CVD control and prevention. Both the *Healthy China 2030* action plan and the *Medium- and Long-Term Plan for NCD Prevention and Treatment in China* covering 2017 to 2025 set targets for CVD mortality for 2022, 2025 and 2030 (Table 1).

Targets / Year	Premature mortality of the main NCDs	Mortality per 100,000	Standardized management rate of hypertension	Annual blood lipid testing rate for residents over 35
2015 (baseline)	18.5%	238.4	50%	19.4% (2012)
2022	≤15.9%	≤209.7	≥60%	27%
2025	≤14.8%	≤205.1	≥70%	≥30%
2030	≤13%	≤190.7	≥70%	35%
Change by 2030	-30%	-20%	+40%	+80%

Table 1: Key indicators of CVD set by relevant policies (Healthy China 2030, Healthy China 2030 action plan 2019-2030, Medium- and Long-term Plan for NCD Prevention and Treatment in China)

The action plan also called for implementing chronic disease management at three levels – government, society, and individuals or families – with each level shouldering some responsibility. One report, “Nutrition and Chronic Disease Status of Chinese Residents 2020”, showed that the premature mortality rate caused by four major NCDs decreased from the baseline 18.5% in 2015 to 16.5% in 2019,

²⁴ <http://www.nhc.gov.cn/jkj/s7915v/201504/15695dca75d74dc48a7f2b6ded188c63.shtml>

already almost reaching the 2022 target of 15.9%. Unfortunately, costs and overall deaths linked to CVD continue to rise.

2.2.3 The high disease burden of CVD requires greater effort

Healthy China 2030 and other policy initiatives in China have achieved success in reducing risk factors linked to CVD and increasing public awareness. Despite these achievements, systemic obstacles remain that limit progress in lowering the CVD burden. Three main concerns center on capabilities, implementing preventative measures, and elderly care.

Capability gaps in primary medical institutions

The *Healthy China 2030* action plan encourages integrated control and prevention of CVD risk factors, including hypertension, high cholesterol, and hyperlipidemia, known collectively as 3H. However, the 3H factors are still treated individually, often in different hospital departments, with little regard to the connection with CVD. As a result, the impact that doctors have on healthy individuals is limited before a direct CVD diagnosis is made. Furthermore, diagnostic and treatment capabilities at many primary-care facilities are not strong enough to control the 3H factors efficiently, especially in remote and less-developed areas. Delays in diagnoses, inadequate adherence to treatments, and delays in accessing specialized care limit the effectiveness of CVD prevention and management. While the hypertension awareness rate reached 52% in 2015, the control rate of 17% remained relatively low. The control rate for diabetes in 2013, 16%, was also low. Improving capabilities in the healthcare system to prevent, treat, and manage CVD using available treatment guidelines would help reduce mortality rates.

Limited emphasis on implementation of preventative measures

The *Healthy China 2030* action plan stipulates risk assessment and early intervention for high-risk groups for efficient CVD prevention. In contrast, the healthcare system currently focuses more on those already diagnosed with CVD and is not engaging early or long enough with healthy people or those at risk for CVD, especially those who suffer from hyperlipidemia. For instance, blood lipid tests have become compulsory in physical examinations, assessing levels of tri-glyceride, total cholesterol, high-density lipid (HDL) cholesterol and LDL cholesterol. However, any abnormalities that are detected fail to get the needed attention from doctors and patients. As a result, there is often inadequate medical follow-up, which may lead to more severe health issues over time. Similarly, regular screening for diabetes and early medical intervention could help to prevent onset of CVD, a common complication.

More attention needed in elderly care

An aging population in China is a clear factor behind the higher incidence of CVD. Between 2000 and 2018, the proportion of China's population of people 60 or older rose from 10% to 18% and the proportion of those 65 or older from 6.8% to 11%²⁰. This trend is expected to continue, adding to the country's CVD burden. Research by Wang LM and others²⁵ concluded that in 2016, 58% of the Chinese 60 years old or older suffered from hypertension, 19% from diabetes, 11% from hypercholesterolemia, and 5% for stroke and 76% of this group suffered from more than one chronic disease. The Chinese Cardiovascular Association estimated in their report of 2018, that even if CVD risk factors remained unchanged, population growth and an aging population would increase the number cardiovascular events, such as angina pectoris, acute myocardial infarction, sudden cardiac death, and stroke, by more than 50% from 2010 to 2030²⁶.

3. Novartis views and proposals

In recent decades, the Chinese government posted remarkable achievements in healthcare. By making health part of the national strategy, the implementation of numerous policies and guidelines paved the way for healthcare system reform. Over the past 10 years, a universal health service system and a health security system have been gradually established and work on disease prevention and control has accelerated at multiple levels of government, all resulting in significant improvement in citizen health and life expectancy. The *Healthy China 2030* framework was established to improve managed care, strengthen the early response system to health threats, and prevent disease. The framework contains special regulations to achieve comprehensive management of disease, establish a tiered diagnosis

²⁵ Study of the prevalence and disease burden of chronic disease in the elderly in China; Wang LM et al; Zhong Hua Liu Xing Bing Xue Za Zhi. 2019 Mar 10; 40(3):277-283. doi: 10.3760/cma.j.issn.0254-6450.2019.03.005 (in Chinese)

²⁶ Report on Cardiovascular Diseases in China 2018

scheme, and advance medical alliances for capability building and scientific exchange. Nationwide monitoring has been conducted to detect risk factors and provide data-based evidence for treatment.

However, because of an aging of the population and the increasing medical, societal, and economic burden of CVD in China, CVD management encounters several challenges from a long-term perspective. To better meet the CVD prevention and control demands, Novartis' proposal to the Chinese government, as follows, presents initiatives for the short-term and longer term to address the CVD burden in China:

- (1) Establish policies with key performance indicators (KPIs) to effectively address the CVD burden.
- (2) Explore innovative partnership models to improve CVD management.
- (3) Elevate CVD management capabilities at the primary care level.

3.1 Establish policies with key performance indicators (KPIs) to effectively address CVD burden

The Chinese government's early and strong actions taken during the Covid-19 pandemic were central to bringing the outbreak under control. Novartis believes a similarly concerted government approach would be needed to address the medical and economic burden caused by CVD. In 2016, President Xi Jinping announced the application of the "Health in All Policies" (HiAP) approach to public policies across sectors. Under the concept²⁷, which reflects the WHO's promotion of intersectoral action for health in 1978, HiAP systematically takes into account the health and health-system implications of decisions, seeks synergies, and avoids harmful health impacts to improve population health and health equity. In addition, it strives to improve the accountability of policy makers for health impacts at all levels of government.

In line with the HiAP approach, *Healthy China 2030* defines health responsibilities at three levels – government, society, and individuals or families – for taking actions that contribute to synergies in addressing needs related to NCDs, including CVD. With regard to CVD, related indicators and comprehensive management of hypertension, hyperlipidemia, and diabetes as medical risk factors of CVD had already been included in *Healthy China 2030*. However, there is a lack of clarity about the implementation of an action plan in line with the policies and work sharing among different healthcare stakeholders. To bridge this gap, special leadership of the central government is required similar to the strong management shown in the context of the Covid-19 pandemic.

Therefore, Novartis supports establishment of a detailed work plan to implement holistic CVD treatment and prevention with defined key performance indicators (KPIs) for each stakeholder group. These KPIs should refer to executable and measurable targets to ensure CVD prevention and control. For example, improving the blood lipid testing rate has been included in *Healthy China 2030* (Table 1) as one measure. Based on the existing knowledge of risk factors, policies need to further specify blood lipid testing by inclusion of different lipid sub-types, such as tri-glyceride, total cholesterol, HDL cholesterol, and LDL cholesterol. KPIs should also be applied in the area of implementation of treatment guidelines, medical institution investment in qualification of personnel and equipment, citizen involvement, and, ultimately, success in achieving health targets. Since the elderly are especially prone to suffer from CVD, KPIs that monitor strengthening health management for NCD and CVD within this group are vital.

Novartis believes that implementation of KPIs on all government levels would support the execution and accelerate the achievement of the *Healthy China 2030* goals.

3.2 Explore innovative partnership models to improve CVD management

Efforts by the Chinese government to lower the human and economic burden of CVD have helped to increase awareness of hypertension and diabetes. However, morbidity and mortality continue to increase due to the aging population and some structural limitations as outlined earlier.

Most CVD conditions are preventable, and Novartis is offering to work with the Chinese government to explore options of a new type of partnership among different stakeholders using a systems-thinking approach that goes beyond conventional healthcare boundaries and practices. We believe a wider range of stakeholders including companies outside the traditional healthcare sector could help in identifying the best incentives for behavioral change toward higher engagement from citizens in their own health.

This partnership should enable full-scale prevention of CVD as we work toward shared goals that proactively identify risk factors, apply differentiated prevention programs on diverse population groups,

²⁷ https://www.euro.who.int/__data/assets/pdf_file/0007/188809/Health-in-All-Policies-final.pdf

and avoid risks through the introduction of new technologies for screening and diagnosing CVD. Such a partnership would foster more comprehensive management of CVD and relevant chronic diseases, like diabetes, hypertension, and hyperlipidemia, which are already targeted in the *Healthy China 2030* action plan. It would also accelerate patient access to potentially transformative therapies and improved health outcomes, giving hope to millions of CVD patients and, ultimately, reducing the economic burden on the healthcare system through avoided cardiovascular events and associated hospital admissions.

Novartis believes such a new partnership among government, industry, and others would improve and accelerate long-term CVD control and economic growth, fulfilling central objectives laid out in the *Healthy China 2030* action plan.

3.3 Elevate CVD management capabilities at primary care level

Novartis welcomes the attention given by the Chinese government to primary care, as shown through various healthcare reform measures including the establishment of a tiered diagnosis scheme designed to deal with most NCDs at primary care centers. As CVD incidence and mortality rates are higher in rural areas than in urban areas, special attention and more investment may be needed in rural primary care facilities. This proposal aligns with the *Rural Vitalization Strategy*, a development blueprint that intends to improve, among other aspects, health management in village clinics and county-level hospitals to serve the health needs of different populations, including the elderly²⁸.

As primary care facilities play a critical role in the CVD control and prevention, Novartis believes they should be a focus of our proposed partnership. Primary care could, for instance, benefit from a systematic training curriculum that includes current treatment guidelines, lessons on standards of care for NCDs and CVD, general elderly care, and a better understanding of behavioral and other risk factors connected to comorbidities in CVD patients. Also, medical infrastructure, such as equipment for screening, imaging technologies, and high-quality drug supply, should be guaranteed for optimal diagnosis and treatment.

Partnership programs could help to develop a system that connects medical resources, enables an exchange of healthcare personnel, and supports alliances among different hospitals and treatment centers. Alliances among different centers and hospitals, especially with lower-tier hospitals, would raise diagnostic and treatment standards and increase awareness and adherence to national CVD treatment guidelines. The programs could be complemented by advanced digital tools, including Internet hospitals and telemedicine, online pharmacies, and artificial intelligence technologies, that can help to improve diagnoses, identification of risk factors, and treatment compliance.

China achieved its goals for alleviating poverty set in the 13th Five-Year-Plan, ending in 2020, and the lives of those under its mandate improved greatly, including their health. Because of the long-term medical burden and economic impact presented by CVD, Novartis suggests including CVD management as a measure for targeted health-related poverty alleviation in the future, covering the reduction of individuals' risk factors, investment in infrastructure, and improved capabilities of health workers.

In the long-term, enhancing capacities and capabilities in rural primary care in the area of CVD would help to reduce the disease burden, prevent health-related poverty, and support achieving *Healthy China 2030* targets.

4. Conclusion

Novartis is committed to delivering science-based medical innovation and welcomes the Chinese government's ongoing efforts in healthcare. We are committed to offering innovative solutions and partnerships that could be valuable in achieving the goals of *Healthy China 2030*.

As CVD is the single leading cause of death globally and in China and the incidence of CVD in China is steadily increasing, we propose that the Chinese government engage in innovative partnerships that focus on the establishment of a comprehensive management system that addresses multiple CVD risk factors through prevention and treatment. Novartis believes that the great societal and economic burden brought by CVD can only be successfully addressed by partnerships among the government, industry, and other stakeholders. Novartis remains committed to collaborate with the Chinese government and to find new approaches to improve and accelerate long-term CVD control and boost economic growth, fulfilling central objectives laid out in the *Healthy China 2030* action plan.

²⁸ http://www.gov.cn/zhengce/2021-02/21/content_5588098.htm