Promoting the Construction of a System for Preventing and Controlling Respiratory Infectious Diseases Among the Elderly, and Improving the Health of the Elderly

Pfizer

Executive Summary

The changing demographic structure and rapid aging of Chinese society pose a significant challenge to the country's economic and social development. The *Opinions of the State Council on the Implementation of the Healthy China Initiative* clearly stated that the health and happiness of the elderly are important symbols of a civilization's progress.[1] China has the world's largest elderly population[2] and one of the fastest rates of population aging.[3] Actively addressing population aging has a significant impact on Chinese society and people's well-being. It is also a crucial step towards achieving high-quality economic development and safeguarding national security and social stability.

Since the 18th CPC National Congress, China has set "actively addressing population aging" as a national strategy. China has since introduced and implemented medium- and long-term plans to address population aging, resulting in the establishment of a comprehensive top-level design and the implementation of major reforms and measures, which have laid a solid foundation for China's ability to cope with its aging population. In 2016, China issued the *Outline of the Healthy China 2030 Plan,*[4] which emphasized that protecting the health of the entire population is the fundamental goal of building a healthy China. The *Plan* is based on two focal points – the whole population and the entire life cycle – while emphasizing the provision of health services that are equitably accessible and systematically continuous. Addressing the health problems of the elderly, as one of the key population groups, is of great significance to realizing the goal of a higher level of health for all. The *Plan* puts forward the key task of promoting healthy aging, emphasizing "advancing the construction of a medical and health service system for the elderly, and promoting the extension of medical and health services to communities and families" and "strengthening health guidance and comprehensive interventions for common and chronic diseases in the elderly, and reinforcing health management for the elderly."[5]

The 14th Five-Year Plan period presents an important window of opportunity for addressing population aging. It is expected that China will become a moderately aging society during this period, and become a significantly aging society by around 2035.[6] During this critical period, China has taken the initiative to more proactively implement national strategy on population aging by issuing the *Opinions of the State Council on the Implementation of the Healthy China Initiative.* This document proposes the implementation of an "Elderly Health Promotion Action" to help improve the health of the elderly, enhance their quality of life, and achieve healthy aging. [7] Since the launch of the "Elderly Health Promotion Action" under the Healthy China initiative in 2019, the health literacy level among the elderly has continued to improve, with life expectancy rising from 77.3 years in 2019[8] to 78.6 years in 2023.[9] In the concluding year of the 14th Five-Year Plan period, the 2025 government work report proposes to "strengthen the construction of professional teams in nursing, pediatrics, pathology, general medicine and geriatrics."[10] This initiative fully reflects China's long-term planning in healthcare policy, protecting the health of the elderly through high-quality medical care.

Disease prevention, as a vital component of healthy aging, plays a positive and effective role in addressing the prominent health issues of the elderly population. The Healthy China initiative emphasizes prevention as its primary focus by prioritizing it prominent in the overall planning. The Healthy China initiative promotes advancing the line of defense for disease prevention and treatment and adopting effective intervention measures.[11] The *National Medium- and Long-Term Plan for Responding Proactively to the Aging Population* calls for the establishment and improvement of an integrated and continuous health service system for the elderly that includes health education and preventive health measures.[12]

Vaccination is an important preventive tool for controlling respiratory infectious diseases and improving health of the elderly. Preventive vaccination can protect the whole population throughout a patient's life cycle. For the elderly, especially those with underlying diseases, vaccination is not only essential but its safety and effectiveness for elderly patients have been validated.[13] Several guidelines on chronic disease prevention and treatment have identified the elderly as a key target group and recommend the elderly population to be vaccinated against common infectious diseases.[14] [15] [16] As a population group that is highly susceptible to respiratory infectious diseases, elderly individuals urgently need preventive measures to safeguard their health. [17] The *Healthy China Initiative (2019–2030)*[18], issued by the Healthy China Action Promotion Committee in July 2019, recommends that high-risk populations such as the elderly and patients with chronic respiratory diseases proactively receive influenza and pneumococcal

vaccines. The General Office of the National Health Commission has issued the *Key information for the Prevention of Incapacity in Older Adults*, which recommends that the elderly receive pneumococcal and shingles vaccines regularly, and that they receive influenza vaccines under a physician's guidance before the influenza epidemic season.[19] Taking pneumococcal disease as an example, in China, pneumococcal disease is a common respiratory infection that poses a serious threat to the health of the elderly population. Studies show that *Streptococcus pneumoniae* bacteria is one of the main pathogens responsible for community-acquired pneumonia (CAP),[20] with the hospital mortality rate for elderly CAP patients reaching 5.7%.[21] China has designated promoting pneumococcal vaccination as a key task in the *Healthy China Initiative (2019-2030)*.[22] However, for the time being, the vaccination rate for the elderly in China is generally low. Vaccination efforts for the elderly face certain "bottlenecks" and constraints.[23]

Accelerating vaccine innovation is not only of significant importance in building a respiratory infectious disease prevention and control system for the elderly, but also meets the people's demand for high-quality pharmaceutical products, thereby realizing the goal of healthy aging. The accelerated launch of the COVID-19 vaccine provides an important example for the prevention and control of respiratory infectious diseases among the elderly in China. By February 2023, there were 241,688,000 people over the age of 60 who had received the COVID-19 vaccine in China.[24] The National Medical Products Administration (NMPA) and other departments accelerated the vaccine approval process of the COVID-19 vaccine through conditional approval, enabling the COVID-19 vaccine to benefit the general population as quickly as possible and providing a strong guarantee for epidemic prevention and control. The *Opinions on Comprehensively Deepening the Regulatory Reform of Drugs and Medical Devices to Promote the High-Quality Development of the Pharmaceutical Industry*, issued by the General Office of the State Council, set the goal of building a globally competitive innovation ecosystem to transition China from a big pharmaceutical country to a pharmaceutical powerhouse, better meeting the people's demand for high-quality drugs and medical devices.[25] With the advancement of Healthy China and the high-quality development of the pharmaceutical industry, China needs to improve the review and approval mechanisms for innovative vaccine products to address the unmet needs of patients regarding respiratory infectious diseases in a timely manner and to control the growth of medical expenses and socio-economic costs.

As a leading global biopharmaceutical company, Pfizer is committed to supporting China in strengthening capacity-building for the prevention and control of respiratory infectious disease and safeguarding the health of the elderly. We are committed to contributing to these efforts and propose the following

recommendations for reference in the formulation of future policy actions:

- **Actively promote conditional approval to facilitate the introduction of innovative vaccines:** Utilize the experience gained from the conditional approval of COVID-19 vaccines to expedite the approval of innovative vaccines for respiratory infectious disease. The introduction of mature and innovative vaccines already approved in other markets can reduce the incidence of respiratory infectious disease among the elderly, reduce the length and frequency of hospitalization for the elderly, and alleviate the socioeconomic burden.
- **Optimize infectious disease monitoring system to provide high-quality evidence for vaccine introduction decision-making:** National health authorities can leverage existing data monitoring networks to build a nationwide surveillance system for respiratory infectious diseases, particularly for pneumococcal disease. This system should assess vaccination coverage, the disease burden and economic burden of vaccine-preventable diseases. The system should also measure the preventive effect of individual vaccines and their impact on disease incidence, providing solid evidence for the selection and application of effective vaccines.
- **Establish diversified payment channels for vaccines covered by immunization programs to improve the affordability of vaccines for respiratory infectious diseases:** Introduce multi-payer mechanisms, including commercial health insurance and city-customized affordable medical insurance (e.g., *huiminbao*), and encourage pilot programs in eligible regions to leverage multi-payer mechanisms to incorporate urgently needed and innovative vaccines into elderly immunization programs.
- **Increase the number of vaccination sites for respiratory infectious diseases for key population groups including the elderly to improve the coverage and convenience of vaccination services:** Scientifically plan and establish vaccination sites to provide convenient vaccination services for the elderly and high-risk groups.
- **Strengthen health education for the public by raising awareness of respiratory infectious disease and vaccination and encourage vaccination:** Strengthen public education on respiratory infectious diseases and vaccines, particularly among the elderly and other high-risk groups, to boost vaccine confidence and encourage vaccination.
- **Strengthen grass-roots health capacity-building, improve the**

awareness of primary-level healthcare practitioners regarding the prevention and treatment of respiratory infectious diseases: Comprehensively enhance the capacity of primary-level medical institutions to prevent and control respiratory infectious diseases by increasing financial investment, improving infrastructure, and strengthening personnel training. Establish primary-level training mechanisms, provide regular training to primary-level medical staff on the diagnosis and treatment of respiratory infectious disease and vaccination.

1. Introduction

Pneumococcal disease is a major global public health challenge and a leading cause of morbidity and mortality among the elderly in China. *Streptococcus pneumoniae* bacteria are primary pathogens causing severe diseases such as pneumonia, meningitis, and bacteremia, as well as common conditions like acute middle ear infection (otitis media) and sinusitis. Pneumococcal disease is prevalent among infants, the elderly, and individuals with underlying health conditions.[26] In 2021, the Institute for Health Metrics and Evaluation (IHME) at the University of Washington conducted a study of 18 common pathogen categories. The study found that lower respiratory infections induced by *Streptococcus pneumoniae* bacteria have the highest rates of morbidity and mortality, contributing to an estimated 97.9 million cases and 505,000 deaths worldwide in 2021.[27] Data from the Chinese Center for Disease Control and Prevention (CDC) show that *Streptococcus pneumoniae* bacteria are the most frequently detected bacterial pathogen in acute respiratory infections in China, present in 29.9% of acute respiratory cases.[28] Nationwide surveillance shows that for patients over 60 years of age, 25.4% of pneumonia patients and 26.4% of patients with non-pneumonic respiratory infections test positive for *Streptococcus pneumoniae* bacteria.[29] The public health challenges posed by pneumococcal disease cannot be overlooked.

Under the Healthy China strategy, China has made significant strides in the prevention and control of respiratory infectious disease, as well as in improving the health of the elderly population. The "Healthy China 2030" strategy emphasizes "strengthening the prevention and control of major infectious diseases, improving surveillance and early warning mechanisms for infectious diseases", and "strengthening health guidance and integrated interventions for common and chronic diseases of the elderly, as well as enhancing health management for the elderly".[30] China has currently established acute respiratory infectious diseases, including COVID-19 and influenza, surveillance capabilities in 1,041 sentinel hospitals, covering all prefecture-level cities and representative counties.[31] China's CDC releases weekly, multi-pathogen surveillance results and regular health advisories to reduce the risk of respiratory infections.[32] Since the launch of the "Healthy China Initiative – Elderly Health Promotion Action" in 2019, the health literacy level among the elderly has continued to improve, with life expectancy rising from 77.3 years in 2019[33] to 78.6 years in 2023.[34] In recent years, China has attached great importance to the development of disease control, vigorously promoting the prevention and control of respiratory infectious diseases among the elderly. The *National Disease Prevention and Control Action Plan (2024-2025)* identified the elderly and children as key population groups for acute respiratory infection prevention and control.[35] China CDC's vaccination guidelines identify the elderly as a key population and actively advocate for timely vaccination among the

elderly.[36] [37]

The development of innovative vaccines, as a hallmark of new quality productive forces, reflects a nation's scientific and technological capabilities. The *14th Five-Year Plan for Pharmaceutical Industry Development* emphasizes attracting global pharmaceutical innovation resources to China and encouraging multinational companies to register innovative drugs and medical devices in China first.[38] The enactment and implementation of the *Drug Administration Law* and the *Vaccine Administration Law*, along with drug review and approval reform, have provided solid legislative and policy support for accelerating the research and development of vaccines in China and for enhancing the production capacity of vaccines in China. The accelerated development and rapid market launch of COVID-19 vaccine products was made possible due to existing laws and regulations. The registration of the COVID-19 vaccine took only 11 months from the completion of initial overseas Phase III clinical trials to obtaining conditional approval for market launch.[39] The accelerated approval of COVID-19 vaccines not only contributed significantly to disease prevention and control but also helped the vaccine industry to accumulate valuable experience in innovation.

In the new era of rapid development of the global biomedical industry, accelerating the approval of innovative vaccines is key to enhancing China's innovative vaccine R&D capability, which will also accelerate the process of building a globally competitive pharmaceutical innovation ecosystem. As a global leader in vaccines, Pfizer is committed to becoming an integral part of China's healthcare system. We aim to leverage our research and development experience and resources, continue collaborating with government agencies and Chinese society, accelerate the introduction of innovative breakthrough vaccines to benefit Chinese patients and the general population, and ultimately contribute to the realization of the "Healthy China" vision.

2. Accelerating Approval of Innovative Vaccines will Help to Optimize the Prevention and Control of Respiratory Infectious Disease among the Elderly

2.1 Taking pneumococcal disease as an example, vaccination is a key measure for preventing respiratory infectious disease

In China, elderly people face a high disease burden due to pneumococcal disease, in particular as a result of community-acquired pneumonia (CAP) and meningitis. The 2010 Global Burden of Disease (GBD) study found that among the three major bacterial meningitides in China, pneumococcal meningitis created the highest disease burden. The mortality rate of pneumococcal meningitis increases significantly with age, reaching 14.1% in the 50-69 age group and 29.0% in

patients aged 70 and above.[40] Studies show that the *Streptococcus pneumoniae* bacteria is one of the main pathogens causing CAP in the elderly in China.[41] Elderly CAP patients' overall in-hospital mortality rate were 5.7%.[42] Pneumonia-related hospitalization also increases the short- and long-term risks of cardiovascular disease, further increasing the disease burden associated with pneumococcal disease.[43] Given the lack of active surveillance for pneumococcal disease in China, the burden may be significantly underestimated.

Meanwhile, studies have found that *Streptococcus pneumoniae* bacteria have developed a high resistance to antimicrobial drugs, which further complicates treatment and increases pressure on the healthcare system. A systematic review found that 43.3% of pneumococcal isolates from adult pneumonia patients in China were intermediately or fully resistant to penicillin.[44] A 2018-2020 study on drug sensitivity of hospitalized patients with pneumococcal disease found that 91.8% of pneumococcal strains in patients aged 65 and above were multidrug-resistant.[45] Antimicrobial resistance can lead to prolonged hospitalization, higher treatment costs, and greater difficulty in treatment. This will increase cost of patient care, take up more healthcare resources, and place a heavy burden on the healthcare system.[46]

Given the severe challenges posed by pneumococcal disease, vaccination is the best option for preventing illness and reducing the disease burden. Since 2003, the World Health Organization (WHO) has recommended vaccination to mitigate the global public health impact of pneumococcal disease.[47] In China, the *Healthy China Initiative (2019-2030)* designated pneumococcal vaccination as a key task.[48] China also issued several national vaccination guidelines related to pneumococcal disease, such as the *Technical Guidelines for the Application of Pneumococcal Disease-Related Vaccines (2012 Edition)*[49] and the *Technical Guidelines for Influenza Vaccination in China (2023-2024).*[50] Additionally, the *Expert Consensus on Vaccination Against Common Infectious Diseases in the Community-Dwelling Elderly*[51] and the *Expert Consensus on Immunoprophylaxis of Pneumococcal Disease (2020 Edition),*[52] as well as guidelines for major chronic diseases like chronic obstructive pulmonary disease, community-acquired pneumonia, and diabetes, recommend regular pneumococcal vaccination for the elderly to reduce the risk of infection. These policy and technical consensus documents provide a scientific foundation and practical guidance for pneumococcal vaccination, and may contribute to improving vaccination rates, protecting elderly health, and realizing the strategic goals of Healthy China.

2.2 Enhancing respiratory infectious disease prevention and control requires accelerating the approval of innovative vaccines

While vaccines for the prevention of pneumococcal infection are available in China, there are still unmet medical needs in disease prevention and control. Currently, vaccines targeting pneumococcal disease available in China have no or limited effectiveness against community acquired pneumonia,[53] [54] which is the most common presentation of pneumococcal disease in the elderly. Innovative vaccines with better protective effects are urgently needed for the prevention of respiratory infectious diseases in the elderly.

The 20-valent pneumococcal conjugate vaccine (PCV20) has significant immunological advantages and is widely used in 63 countries and regions. Compared with regular polysaccharide vaccines, pneumococcal conjugate vaccines (PCVs) offer better protection against pneumococcal infections. An observational study comparing regular polysaccharide vaccines and pneumococcal conjugate vaccines in the same adult population found that pneumococcal conjugate vaccines are more effective than regular polysaccharide vaccines in preventing pneumococcal pneumonia and all-cause pneumonia.[55] PCV induces the production of serotype-specific immune responses associated with functional activity and establishes immune memory.[56] PCV also prevents mucosal diseases such as nasopharyngeal carriage and non-bacteremic pneumonia. PCV provides long-term protection and is effective in strengthening the immune responses upon subsequent vaccinations. In conclusion, PCV20 can effectively reduce incidence of related diseases.

Notably, PCV20 has been approved for clinical trials in China and Phase I clinical trials are expected to begin in May 2025. Under the standard approval pathway, PCV20 is anticipated to be approved for market in 2030, resulting in an eight-year gap between its first approval in the United States in 2021 and eventual approval in China.

2.3 China's regulatory reform provides strong policy support and institutional safeguards for the development of the vaccine industry

To encourage pharmaceutical innovation, accelerate the market entry of innovative drugs, and reduce the disease burden on patients, China's drug review and approval reforms have yielded fruitful outcomes. In 2015, the Chinese government-initiated reforms in the drug review and approval systems to enhance regulatory efficiency, expedite new drug approvals, encourage new drug development, and transition China from a "big pharmaceutical country" to a "pharmaceutical powerhouse." In 2020, the National Medical Products Administration (NMPA) issued the revised *Measures for the Administration of Drug Registration*, emphasizing clinical value-oriented innovation and establishing a series of mechanisms for accelerating approval**,** including priority

review and conditional approval, to encourage and expedite the approval of urgently needed innovative drugs and vaccines.[57]

As the most effective and economical means of preventing and controlling infectious diseases, vaccines receive significant attention in research, development, and approval. China's *Vaccine Administration Law*, enacted on December 1, 2019, is the world's first comprehensive law on vaccine management. The law specifically introduced priority review and approval for innovative vaccines that are urgently needed for disease prevention and control.[58] During the COVID-19 pandemic, the NMPA and other departments expedited the approval process for COVID-19 vaccines through conditional approval, enabling accelerated vaccine access for the population and providing strong support for epidemic control. Since the COVID-19 outbreak, five companies' COVID-19 vaccines have received conditional approval or emergency use authorization in China.[59] From 2017 to 2021, the vaccine industry in China developed rapidly, nearly doubling in scale and achieving a compound annual growth rate (CAGR) of 24.3%,[60] significantly higher than the global vaccine market growth rate of 13.5%.[61]

Despite significant progress, China's vaccine industry still faces challenges such as long R&D cycles, high investment costs, and high risks, which hinder its high-quality development. Accelerating the approval of innovative vaccines that are already approved and clinically validated abroad can significantly reduce the resources and time required for research and development by domestic enterprises, which will stimulate local vaccine innovation and contribute to the high-quality development of the biopharmaceutical industry. For instance, once PCV20 receives approval in China, local vaccines can be exempt from Phase I-III clinical trials and could advance their launch timelines by 12-36 months through comparability studies. Additionally, local vaccines can expand the indicated population groups for the vaccine through bridging studies, enabling more people to benefit from vaccination and alleviating pressure on the public health system. Furthermore, post-approval commitments (PAC) will further promote the integration of medical and preventive care, enhance domestic respiratory infectious disease prevention and control capabilities, and enable the coordinated development of the entire vaccine supply chain.

3. Policy Recommendations

Under the guidance of the Healthy China strategy, China has made remarkable achievements in the prevention and control of respiratory infectious diseases and the improvement of the health of the elderly population. With the advancement of Healthy China and the high-quality development of the biopharmaceutical industry, China needs to fully utilize the existing fast-track approval mechanism for innovative vaccine products to accelerate their market access. This will

enhance the capacity for preventing and controlling respiratory infectious diseases and support the growth of the domestic vaccine industry. As a globally leading innovative vaccine company, Pfizer fully supports China's efforts to strengthen the construction of its respiratory infectious disease prevention and control system, encouraging the development of the local vaccine industry and contributing to safeguarding the health of the people.

3.1 Actively promote conditional approval to facilitate the introduction of innovative vaccines and support the prevention and control of respiratory infectious diseases

The rapid approval and launch of COVID-19 vaccines played a crucial role in the prevention and control of the COVID-19 pandemic. The strong collaboration between pharmaceutical regulators, disease prevention and control departments, and other relevant bureaus ensured the efficient implementation of existing innovative measures such as optimized review processes and conditional approvals. Conditional approvals significantly shortened vaccine approval times while ensuring the safety and effectiveness of vaccines, which not only effectively alleviated pressure on medical resources during the pandemic, but also significantly reduced the disease's severity and mortality rate, laying a solid foundation for achieving herd immunity.

At present, China still faces serious challenges in dealing with respiratory infectious diseases. Therefore, we recommend actions to leverage the experience accumulated from the conditional approval of domestic COVID-19 vaccines to accelerate the approval efficiency of innovative vaccine products for respiratory infectious diseases. By accelerating the introduction of innovative vaccine products that have been approved overseas and proven clinically effective, the incidence of respiratory infectious diseases among the elderly population can be reduced, while the number and duration of hospitalizations caused by these diseases can be significantly lowered. This will effectively control rising medical costs, reduce the socio-economic burden, and provide strong support for the prevention and control of respiratory infectious diseases in China.

3.2 Establish a comprehensive infectious disease monitoring system to provide high-quality evidence for vaccine introduction decision-making

Pneumococcal infection has not yet been included in China's established infectious disease reporting system, resulting in a long-term lack of comprehensive and systematic disease monitoring data. Existing disease burden and epidemiological data rely mainly on local studies conducted by medical institutions, lacking a systematic national overview. It is worth noting that although clinical observations show that the

burden of pneumococcal infection among the elderly population is relatively heavy, specific disease burden remains unclear. Key indicators on a national scale such as the incidence rate, mortality rate, and distribution of *Streptococcus pneumoniae* bacteria strains remain absent. In recent years, several more developed regions in China (such as Beijing, Shanghai, Guangzhou, etc.) have taken the lead in including polysaccharide vaccines for pneumococcal disease in the immunization program for the elderly. However, there is still a lack of timely and systematic tracking and evaluation of epidemiological changes after vaccination.

The lack of key evidence-based practices mentioned above not only affects the assessment of the disease burden of pneumococcal disease but also poses challenges to the formation of vaccine policy and optimization of immunization strategies. To address these challenges, we recommend that China improve its infectious disease health monitoring system and conduct relevant research to fill the evidence gap, providing a scientific basis for the introduction of new vaccines. Specifically, we recommend that China build a national pneumococcal disease monitoring system within the public health monitoring data network. Under the leadership of relevant government departments, China can organize disease prevention and control centers at all levels and medical and health institutions to systematically collect data on various innovative vaccines, especially vaccines such as PCV, as well as information on preventable diseases and the economic burden of diseases.[62] After vaccines are introduced, evaluations of their disease prevention effects and overall impact could be conducted. These evaluations are especially important when multiple types of vaccines are available, as they provide scientific evidence for the selection of the most effective vaccines.

3.3 Establish diversified payment channels for vaccines not covered by immunization program to improve the affordability of vaccines for respiratory infectious diseases

Some cities and regions in China currently designate regular polysaccharide vaccines as free vaccines for the elderly. However, in other regions, the elderly population has a low willingness to be vaccinated due to the high cost of vaccines, making it difficult to establish an effective immune barrier. We recommend improving the payment system for innovative vaccines, exploring the establishment of a multi-level medical security mechanism to complement basic medical insurance. This could involve actively introducing multi-party co-payment channels such as commercial medical insurance and city-customized affordable medical insurance (also known as *huiminbao*) and encouraging insurance institutions to expand the supply of insurance products, thus effectively improving patients' ability to pay for innovative vaccines. We also recommend rolling out pilot program for multi-party payment mechanisms in qualified regions, which could include urgently needed and innovative vaccines in immunization

programs for the elderly. These pilot programs could conduct systematic evaluations of the disease prevention impact, vaccine safety, and health economic benefits of each vaccine, providing experience and evidence for promoting vaccine products in other regions of China and even nationwide.

3.4 Increase the number of vaccination sites for respiratory infectious diseases for key population groups such as the elderly, and improve the coverage and convenience of vaccination services

The scientific planning and installation of vaccination sites is one crucial measure to improve the vaccination rate. We recommend setting up vaccination sites near key areas and places such as residential communities and elderly care institutions and providing targeted vaccination services for respiratory infectious diseases to key and high-risk populations such as the elderly, improving the vaccination rate for these key population groups. Individuals who have difficulty receiving vaccination can be provided with mobile vaccination service sites, in-home vaccination services, and other measures to facilitate vaccination.

3.5 Strengthen health education for the public, raise awareness of respiratory infectious disease and vaccination, and encourage vaccination

Data shows that in regions where the pneumococcal vaccine immunization program has been implemented in China, the vaccination rate among the elderly population is still at a relatively low level. For example, the vaccination rate in Shanghai is only 30%, and the vaccination rate in Chengdu is 45%.[63] Neither city has reached their expected immunization program targets. In regions not included in the immunization program, vaccination rates are even lower. This suggests that there remains significant room for improvement in vaccine awareness among the elderly population in China. Therefore, we recommend leveraging new media platforms to conduct campaigns on respiratory infectious diseases and vaccines for the elderly and high-risk populations, aiming to enhance public confidence in vaccination and, consequently, increase vaccination rates. Community-level hospitals, in collaboration with urban and rural community organizations, village (residential) committees on public health, etc., can proactively communicate with key populations such as the elderly. During the peak period for influenza and pneumonia and other key respiratory infectious diseases, such as in autumn and winter, community-level institutions can provide guidance to the elderly on receiving vaccination. In addition, we also recommend regular updates to the expert consensus on immunoprophylaxis for pneumococcal disease and relevant technical guidelines for vaccination. This will ensure that the public can has

timely access to the latest and most optimal prevention and treatment methods. The current *Expert Consensus on Immunoprophylaxis of Pneumococcal Disease (2020 Edition)* and *Technical Guidelines for the Application of Pneumococcal Disease-Related Vaccines (2012 Edition)* do not yet include recommendations for innovative vaccines (such as PCV20) against pneumococcal disease.

3.6 Strengthen grass-roots health capacity-building, improve the awareness of primary-level healthcare practitioners regarding the prevention and treatment of respiratory infectious diseases, and promote the use of vaccines as an effective preventive measure

"Moving forward the line of defense" for respiratory infectious diseases requires implementing the principle of "using prevention as the main tool." [64] To fully enhance primary-level medical institutions' capacity to prevent and control respiratory infectious diseases, we suggest focusing on bolstering the capacity of the primary-level medical and health service system through efforts such as increasing financial investment, improving infrastructure, and supporting talent cultivation. It is also important to establish and improve the training mechanism for primary-level healthcare practitioners and to regularly carry out targeted training programs for primary-level medical staff on respiratory infectious disease treatment and vaccination. Promoting the use of vaccination as an effective preventive measure is a critical step towards accelerating the construction of a strong defense for the health of key populations.

4. Conclusion

In the face of the severe challenges posed by respiratory infectious diseases, vaccination serves as an important measure to prevent related diseases and reduce the disease burden. Under the guidance of the Healthy China Strategy, China has already achieved remarkable progress in the prevention and control of respiratory infectious diseases and improving the health of the elderly population. We recommend that China accelerate the approval of innovative vaccines, improve the infectious disease monitoring system, promote diversified reimbursement methods for vaccines not covered by immunization programs, provide more convenient and accessible vaccination services, strengthen public health education, and enhance primary-level healthcare institutions' capacity in preventing and controlling respiratory infectious diseases. We believe that these measures will help China further consolidate its capacity for combating respiratory infectious diseases, effectively safeguard the health of the elderly population, and promote the innovative development of the domestic vaccine industry.

Pfizer is always committed to collaborating with the Chinese government and all

sectors of Chinese society to accelerate R&D and innovation and to enhance Chinese patients' access to innovative vaccines. We will firmly support the "Healthy China 2030" strategy and the high-quality development of China's biopharmaceutical industry. We look forward to further discussions and exchanges with relevant government agencies, experts, and partners.

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