Introduction

1

Heya Yi, Chuchu Ye, and Weizhong Yang

1.1 Significance of the "Belt and Road Initiative"

1.1.1 Proposal and Development of the "Belt and Road Initiative"

In September and October 2013, during a visit to Central and Southeast Asia, President Xi Jinping proposed an important initiative to jointly construct the "Silk Road Economic Belt" and the "Twenty-First Century Maritime Silk Road" (hereinafter referred to as the "Belt and Road Initiative") [1]. His proposal aroused the immediate attention of the international community. Availing itself of the historic symbolism of the ancient "Silk Road" and under the banner of peaceful development, the "Belt and Road Initiative" aims to actively develop economic cooperation partnerships with countries neighboring the project's routes while building a community of shared interests, futures, and responsibilities based on mutual political trust, economic integration, and cultural inclusiveness [2]. On March 28, 2015, the

The original version of this chapter was revised. A correction to this chapter is available at https://doi.org/10.1007/978-981-33-6958-0_15

H. Yi
Chinese Preventive Medicine Association, Beijing, People's Republic of China

C. Ye
Shanghai Pudong New Area Center for Disease Control and Prevention, Shanghai, People's Republic of China

W. Yang (✉)
Chinese Academy of Medical Sciences & Peking Union Medical College, Chinese Preventive Medicine Association, The UN Consultative Committee on Life Science and Human Health (CCLH) of China Association of Science and Technology (CAST), Beijing, P.R China
e-mail: yangwz@chinacdc.cn

W. Yang (ed.), *Prevention and Control of Infectious Diseases in BRI Countries*, https://doi.org/10.1007/978-981-33-6958-0_1

National Development and Reform Commission, the Ministry of Foreign Affairs and the Ministry of Commerce of the People's Republic of China issued "Vision and Actions of Jointly Building the Silk Road Economic Belt and the Twenty-First Century Maritime Silk Road." In an effort to clarify the "Belt and Road Initiative," this document elaborates on the project's historical context, principle of joint construction, logical framework, cooperative focus and cooperation mechanism, among other aspects. Based on a fundamental position of "policy coordination, connectivity of infrastructure and facilities, unimpeded trade, financial integration and people-to-people bonds," the document highlights the goals of promoting economic prosperity and regional economic cooperation among countries along the "Belt and Road," strengthening exchange and mutual learning among different civilizations, promoting world peace and development, and benefiting the people of all countries [2].

1.1.2 Significance of the "Belt and Road Initiative"

The "Belt and Road Initiative" is China's most important initiative for regional cooperation and a form of economic diplomacy involving the investment of a wide variety of resources. The project reflects China's needs for comprehensively deepening reform and opening up to the outside world and will serve the fundamental interests of all participating parties. It adheres to the concepts of joint discussion, joint construction, and mutual benefit and aims to achieve win–win cooperation in terms of communal development and common prosperity [3, 4].

1.1.3 China and Countries Along the Belt and Road

The "Belt and Road" will extend across Asia, Europe, and Africa. On one end is the energetic East Asia economic circle, while on the other lies the developed European economic circle. In between are the vast hinterland countries that hold great potential for economic development. The "Silk Road Economic Belt" seeks to create uninterrupted transport links between China and Europe (the Baltic Sea) via Central Asia and Russia, between China and the Persian Gulf and the Mediterranean through Central and West Asia, and between China and Southeast Asia, South Asia, and the Indian Ocean. The "Twenty-First Century Maritime Silk Road" is proposed to extend from China's coastal ports across the South China Sea to the Indian Ocean, Europe, and the South Pacific [5].

This book uses the following criteria in selecting 34 "Belt and Road" countries as key research objects: the existence of an intergovernmental framework of cooperation with China, close economic ties and frequent exchanges of governmental personnel with China, broad space for development, as well as medical and health cooperation needs and prospects, in particular, in terms of weakness in preventing and treating certain infectious diseases because of the influence of traditional religious, cultural, and social customs. In the Asia Pacific region, countries selected are Mongolia, Singapore, Malaysia, Thailand, Indonesia, the Philippines, Brunei,

Cambodia, Myanmar, Laos and Vietnam. In Central Asia, they are Kazakhstan, Uzbekistan, Turkmenistan, Tajikistan, and Kyrgyzstan. In West Asia, they are Iran, Iraq, Turkey, Israel, Saudi Arabia, and the United Arab Emirates. In South Asia, they are Afghanistan, Pakistan, India, Bangladesh, Sri Lanka, the Maldives, and Nepal. In Eastern Europe, they are Russia and Ukraine. Finally, in Africa, they are Kenya, Ethiopia, and Egypt.

1.2 Significance of Health Cooperation in the "Belt and Road Initiative"

1.2.1 Overview of Health Cooperation Between Countries Along the "Belt and Road" and China

Partial statistics in recent years have shown that China has worked closely in the health field with countries along the "Belt and Road" [6]. China has signed bilateral intergovernmental health cooperation agreements or memoranda of understanding with Mongolia, the Philippines, Laos, Cambodia, Malaysia, Myanmar, Singapore, Thailand, Brunei, Vietnam, Indonesia, Pakistan, Nepal, Maldives, Bangladesh, Sri Lanka, India, Afghanistan, Saudi Arabia, Turkey, Iran, Israel, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan, Russia, Ukraine, Egypt, and other countries. The cooperation covers human resources development in the health field, including health management, the health of women and children, the prevention and control of infectious and chronic diseases, health education, clinical diagnosis, and treatment technology, as well as medical and health services. In addition to bilateral cooperation through exchanges and cooperation platforms (including World Health Organization (WHO) multilateral mechanisms, the Forum on China-Africa Health Cooperation, the China-ASEAN Health Cooperation Forum, the China-CEEC Health Ministers' Forum, the China-Arab States Health Cooperation Forum, the BRICS Health Ministers Meeting, the Meeting of Health Ministers of the Shanghai Cooperation Organization, the G20 Health Ministers' Meeting, the Lancang-Mekong Cooperation program, the Greater Mekong Subregion program and the APEC Health Working Group), China and the "Belt and Road" countries are comprehensively increasing health cooperation and jointly seeking to safeguard regional health and security through various formats, such as high-level mutual visits, institutional exchange and dialogue, cooperative projects, and cooperation agreements.

1.2.2 Health Cooperation in the "Belt and Road Initiative"

Health cooperation, with the aim of improving people's health and well-being, is an area of cooperation with low political sensitivity and high social recognition [7]. It is not only an important aspect of international policy coordination but also a significant link to connect people. Deepening "Belt and Road" health exchanges and cooperation and constructing a "Silk Road" for health are important to a healthy

China and represent a popular foundation and strong argument for the "Belt and Road Initiative," as well as a requirement in building a community with a shared human future. In October 2015, the "Three-year Plan for the Implementation of the 'Belt and Road Initiative' Health Exchange and Cooperation (2015–2017)" was published by the former National Health and Family Planning Commission, and the efforts to realize a healthy "Silk Road" have yielded preliminary results. In January 2017, President Xi Jinping visited WHO headquarters. The Government of the People's Republic of China and the World Health Organization signed the "Memorandum of Understanding" on Cooperation in the Health Field of the "Belt and Road" a milestone in the cooperation between the two sides to improve the health of countries along the "Belt and Road." In November 2018, the National Health Commission published "Guidelines for Further Promoting the 'Belt and Road Initiative' for Health Cooperation and Exchange," which clarified cooperation in key areas of strengthening health safety and promoting health development and innovation.

1.2.3 Main Components of Health Cooperation in the "Belt and Road Initiative"

The primary components of health cooperation and exchange are as follows: strengthening the prevention and control of infectious diseases and the construction of a health emergency response capacity, enhancing the health system, promoting women and children's health, improving healthcare services and management, boosting the development of traditional medicine, promoting healthy aging, furthering the prevention and control of chronic diseases, advancing medical technology, research, development, and developing the health industry [7]. Health cooperation and exchanges have strengthened health security and public support for the "Belt and Road Initiative."

1.3 Infectious Diseases Remaining an Important Public Health Security Problem

1.3.1 Dual Threats of New and Old Infectious Diseases and the Transnational and Transcontinental Transmission of These Diseases [8–10]

In the last 40 years, the world has been faced with the dual threats of new and old infectious diseases, seeing a resurgence, due to natural disasters, ecological changes, wars, weakened public health systems, etc., of many ancient infectious diseases brought under control in the past.

A few months after the 2010 earthquake in Haiti, the largest cholera outbreak ever occurred in a single country after the twentieth century sickened more than 680,000 Haitians, killing more than 8000.

In 2002, Tajikistan announced the eradication of polio. However, from February to July 2010, Tajikistan saw an outbreak of wild poliovirus type 1 (originated in India). A total of 458 cases of wild poliovirus were reported across 35 administrative regions, causing the death of 26 people. Subsequently, the epidemic spread to three other polio-free countries: Russia (14 cases), Turkmenistan (3 cases), and Kazakhstan (1 case). The WHO Western Pacific Region, which includes China, was declared polio-free in 2000. However, an outbreak caused by an imported poliovirus occurred in 2011 in Xinjiang. WHO confirmed that it had been caused by a wild-type poliovirus imported from Pakistan, as evidence showed a high degree of homologous nucleotide sequencing in the viruses isolated in Hotan and in Pakistan. In recent years, Pakistan and Afghanistan faced domestic sustained circulation of WPV1 and VDPV outbreak, especially in the first half of the year 2020, both WPV1 cases and type 2 VDPV cases number reached the highest level compared with the same period during 2016–2019, as 55 WPV1 and 52 VDPV2 in Pakistan, 26 WPV1 and 29 VDPV2 cases in Afghanistan, which are signals of importation and wide-spread of polio-virus to other countries. Type 2 VDPV is becoming as risk as wild polio-virus after the SWITCH of polio vaccine from trivalent OPV to bivalent OPV, disposing of type 2 component in OPV vaccine, population's susceptibility to type 2 polio is increasing.

In October 2017, the largest outbreak of hepatitis A in the United States in the last 20 years sickened more than 600 individuals and resulted in more than 20 deaths.

Since the beginning of the twentieth century, tuberculosis (TB) has been brought under control in many countries. However, since the late 1980s, many developed and developing countries have experienced a sharp rise in TB to the extent that the WHO declared a global TB emergency in 1993. Today, the incidence of TB in many parts of the world remains high, and outbreaks continue to occur in certain areas. The medication resistance and ongoing transmission of *Mycobacterium tuberculosis* remain a serious challenge worldwide.

In 1997, the world's first human case of the highly pathogenic avian influenza virus H5N1 was observed in China's Hong Kong Special Administrative Region. Subsequent human avian influenza H5N1 outbreaks occurred in many countries in East Asia, Southeast Asia, and North Africa, all with high mortality. In March 2013, acute respiratory infections caused by the new H7N9 avian influenza virus were first detected in Shanghai, China. From 2013 to 2017, the H7N9 avian influenza cases reached more than 1000, and the mortality was also high. In the spring of 2009, an H1N1 influenza pandemic that began in Mexico and the United States spread to 214 countries, territories, and regions in less than a year, causing tens of millions of cases and 18,449 deaths. Another more than 200,000 died from associated respiratory diseases.

Zika virus disease was listed by WHO as "a public health emergency of international concern" from February to November 2016 and received much attention. Before 2007, the distribution of Zika virus disease was mainly limited to tropical Africa and Southeast Asia. However, outbreaks were reported in Pacific countries from 2013 to 2014. After Zika virus disease was reported in Brazil in 2015, the disease spread rapidly. As of 2017, vector transmission of Zika virus disease had

been found in 84 countries. Over the past 50 years, the reported incidence of dengue fever has increased 30-fold and is endemic or highly endemic in 128 tropical and subtropical countries in Asia, the Americas, Africa, and Europe. According to estimates, 390 million individuals worldwide are infected with dengue fever annually, among whom 96 million are severe incidences. Yellow fever was formerly endemic in tropical regions of Central and South America and Africa, with no cases reported in Asia. Angola has been overwhelmed with a widespread yellow fever epidemic since December 2015. As of the end of 2016, yellow fever had killed at least 376 individuals and spread to surrounding countries, causing at least 16 deaths in the Democratic Republic of the Congo. Since 2016, China has reported more than ten imported yellow fever cases from abroad. Rift Valley fever has been detected in more than 30 countries. The disease is mainly distributed in Eastern and Southern Africa, including Kenya, Zimbabwe, Zambia, Namibia, and Somalia. Outbreaks have also occurred in Saudi Arabia and Yemen in Asia. In 2016, the first case of imported Rift Valley fever was detected in China.

In August 2017, the plague outbreak in Madagascar, with more than 2000 cases and over 200 deaths, was the strongest in 50 years and arose widespread global concern.

In addition, over the last 40 years, new infectious disease pathogens or their corresponding diseases have appeared nearly every year worldwide, some of which have developed into widespread epidemics. Since the 1970s, repeated outbreaks of Ebola have occurred in Africa. In December 2013, an outbreak of Ebola began in Guinea in West Africa and later spread to other West African countries, such as Liberia, Sierra Leone, and Nigeria. This West African Ebola outbreak resulted in the highest recorded number of incidences and deaths and was the most widespread. WHO attached substantial importance to the outbreak, announcing on August 8, 2014, that the epidemic was “unusual” and constituted an “international public health emergency.” In February 2003, severe acute respiratory syndrome (SARS) caused by SARS coronavirus (SARS-Cov) was first detected in China. It spread rapidly around the world and caused more than 8000 infections in 29 countries (mainly adults aged 25–70 years) and more than 700 deaths. No case has been reported since 2005.

In September 2012, cases of Middle East Respiratory Syndrome (MERS) were first detected in Saudi Arabia, and subsequent cases of MERS were reported in several countries in Asia, Africa, Europe, and the Americas. In May 2015, after several imported cases found in South Korea, there was a clustered MERS outbreak. A total of 186 confirmed cases were reported, of which 36 were fatal. Two of these confirmed cases might be infections within a family, and the remaining ones were infections occurred in medical- and healthcare-related locations. There was one case of initial incidence, 29 second-generation cases, 125 third-generation cases, 25 fourth-generation cases, and six cases of unknown generation. With the exception of the initial incidence, secondary cases occurred in 12 cases, of which one case resulted in 84 subsequent infections. In late May 2015, a case of MERS imported from South Korea was found in Guangdong Province, China. Thanks to its effective public health measures, there were no second-generation cases.

In December 2019, pneumonia of unknown cases occurred in Wuhan City, Hubei Province, China. Laboratory tests revealed that it was caused by a novel coronavirus, which was later named 2019 Novel coronavirus (2019-nCoV) by the WHO. It caused a pandemic in 2020, and the pandemic continued to spread. According to the latest WHO epidemic report, as of CET, 1 November 2020, a total of 45,942,902 confirmed cases have been reported in 217 countries and regions on six continents, with a total of 1,192,644 deaths, and a death/case ratio of 2.6%.

In the 1980s, acquired immunodeficiency syndrome (AIDS) was first discovered in the United States. Then it spread worldwide and became a serious public health problem.

1.3.2 Risk Factors for Infectious Disease Transmission

Modern transportation has facilitated the movement of people and things around the world. There are approximately 5000 airports worldwide, with one million flights per week and approximately four billion trips per year. Pathogens do not require visas to travel freely, and thus, the transport system poses risks with respect to disease transmission. Both SARS and MERS were spread rapidly across borders and continents in a short period of time by travelers. Deforestation, large-scale dam construction, mining, oil and natural gas projects, global warming caused by CO_2 emissions, and changes in the ecological environment have all affected the distribution of pathogens and vector organisms, giving rise to the increased incidence or distribution changes in mosquito-borne dengue fever and Zika virus disease and increased risk with respect to water-borne diseases, like cholera. Natural disasters and accidents undermine the effect of safeguard measures for public health, like the water supply system, hence the outbreaks of infectious diseases. As war, natural disasters, and other factors weaken or even destroy the healthcare system, diseases once brought under control may regain virulence, and as a result, measures taken to eradicate the disease have to be adopted once again, like in the polio outbreak.

Unsafe blood, biological products, and medical practices due to regulatory failure or accidents can facilitate the transmission and even outbreak of iatrogenic disease. The outbreak of SARS in 2003 in China and MERS in 2015 in South Korea both involved high rates of hospital transmission, which caused substantial socioeconomic losses and social panic.

The misuse of antibiotics in humans, poultry, and livestock leads to antibiotic resistance and the spread of pathogens, which can increase the risk of infectious diseases. In the past 10 years, many countries have reported cases of carbapenem-resistant Enterobacteriaceae (CRE) infection, and this infection has exhibited a trend of rapid increase. Pressure from the environment and the host causes the pathogenic microorganisms to mutate such that nonpathogenic strains become pathogenic, and weakly virulent strains become strongly virulent, or new pathogenic strains.

In 2001, an incident involving white anthrax powder occurred in the United States. Biological terrorism represents another potential source of outbreaks of infectious diseases.

Before the total elimination of original risk factors for infectious diseases, new ones have emerged. Risk factors for infectious diseases are widespread. As a result, new infectious diseases have emerged continuously before the eradication of ancient ones. Coupled with people's limited understanding of infectious disease pathogens and their epidemic patterns, the occurrence and development of infectious diseases remain highly uncertain. The prevention and control of infectious diseases remains a very challenging task and must not be neglected. In implementing the "Belt and Road Initiative," it is necessary and important to thoroughly assess the risk of infectious diseases and adopt corresponding countermeasures.

1.4 Data Sources

This book uses data from the World Health Organization (WHO), United Nations International Children's Emergency Fund (UNICEF), Global Outbreak Alert and Response Network (GOARN), websites of international organizations such as ProMED, USAID, Greater Mekong communique, websites of national health administration departments and CDCs from several counties, domestic and international databases of scientific and technological papers, such as Wanfang, CNKI, PubMed, MEDLINE, etc. Relevant websites are as follows:

- http://www.fmprc.gov.cn/web/
- http://www.who.int/countries/en/
- http://www.who.int/topics/zh/
- http://www.who.int/gho/countries/en/
- http://www.who.int/immunization/monitoring_surveillance/data/en/
- http://www.who.int/ith/en/
- http://219.238.166.215/mcp/index.asp
- http://www.healthdata.org/gbd
- http://www.healthmap.org/zh/
- http://www.oecd.org/health/
- http://wwwnc.cdc.gov/travel

References

1. People's Daily Online. Carry forward the friendship among peoples and create a better future together. http://www.people.com.cn/24hour/n/2013/0908/c25408-22842973.html. Accessed 8 Sep 2013.
2. People's Daily Online. Xi Jinping addressed the Indonesian Parliament: Work together to build a China-ASEAN community of shared future. http://politics.people.com.cn/n/2013/1003/c1024-23101573.html. Accessed 3 Oct 2013.
3. Ge S. Global vision—"the Belt and Road". Int Stud. 2016;2:1–13.
4. Guoyou S. The strategic vision of "the Belt and Road" and new development of China's economic diplomacy. Collected papers of Division of International Studies. Chin Acad Soc Sci. 2017;10:255–67.

5. The vision and actions of jointly building the Silk Road Economic Belt and the 21st Century Maritime Silk Road. [N/OL]. Xinhuanet. Accessed 6 Apr 2015.
6. Siling Y. Governance and challenges of China's relations with countries along the Belt and Road. South Asian Studies. 2015;2:15–34.
7. Hongwei Y. Build a silk road of health in the context of the Belt and Road Initiative. China Health. 2016;7:40–1.
8. China Preventive Medicine Association. Report on disciplinary development in Public Health and Preventive Medicine 2016–2017. Beijing: China Science and Technology Press, 2018.
9. Weizhong Y. China's Health Emergency Response 2003–2013. Beijing: People's Medical Publishing House; 2014.
10. China Preventive Medicine Association. Report on disciplinary development in Public Health and Preventive Medicine 2014–2015. Beijing: China Science and Technology Press; 2016.