PREFACE

MALARIA CONTROL AND ELIMINATION PROGRAMME IN THE PEOPLE'S REPUBLIC OF CHINA

The purpose of this special issue is to tell the story of China's successful control of malaria in recent decades and its careful planning to move the country to an elimination phase (Tambo et al., 2012; Zhou et al., 2014). China has made considerable progress on slowing malaria transmission over the past 60 years, but few health researchers and programme managers outside of China are aware of how this has been achieved.

Historical evidence on the prevalence of malaria goes back 4000 years. Over 30 million annual cases are estimated to have occurred prior to the establishment of the People's Republic of China in 1949 (Tang, 2009; Chen, 2014). After 1949, a number of initiatives were undertaken to control malaria, but incidence remained at more than 24 million through the early 1970s. Through sustained efforts in different control phases, the number of cases dramatically declined to less than 15,000 by 2009. At the same time, the scope of endemic areas was greatly narrowed. Falciparum malaria was eliminated by this time except in Hainan and Yunnan provinces (Yin et al., 2014). In 2010 China took the large step of initiating the National Malaria Elimination Programme (NMEP), described in the government document of 'Action Plan for Malaria Elimination in China' co-issued by 13 ministries in 2010. In the context of achieving the Millennium Development Goals as well as the global goal to eradicate malaria, China committed to eliminating malaria by 2020 (Gao et al., 2011).

Many challenges remain for China to achieve its elimination goal. This collection of papers discusses how China is moving from the control stage to the elimination stage. After reviewing the history of malaria control, papers in this volume discuss how to prepare for resurgence, how to deal with border issues and how to engender greater international cooperation (Figure 1).

First, Chapters 1 and 2 present national historical patterns of transmission of malaria as well as a feasibility analysis and a road map analysis on malaria elimination (Yin et al., 2014; Zhou et al., 2014). The first stage of control from 1950 to 1980 was characterised by high malaria prevalence

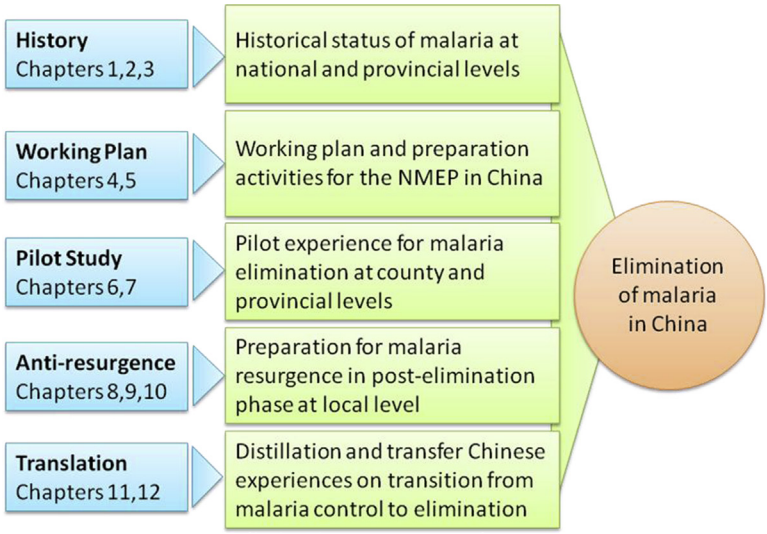

Figure 1 Organisation of the special issue.

with fluctuating peaks roughly every 10 years. During the second stage after 1980, there were slight rebounds but no incidence peaks due to sustained control efforts and improved capacity. This significant reduction of malaria incidence both in the control stage was demonstrated by the experiences at the provincial level in Hainan and Yunnan in Chapter 3 (Xia et al., 2014b). Chapter 3 discusses the situation in Yunnan and Hainan, which have experienced high malaria transmission with falciparum and vivax malaria epidemic year round. This is due to ecological conditions well suited for transmission and very efficient vectors, *Anopheles minimus* and *An. dirus.* Understanding progress and challenges in these provinces is critical not only to further elimination here but also in the entire country.

Second, Chapters 4 and 5 provide a view of preparations to launch the NMEP (Chen et al., 2014; Feng et al., 2014b). Chapter 4 introduces the working plan for surveillance and response systems in the malaria elimination phase, with the key indicators for an elimination plan. Imported cases provide particular challenges in the NMEP. To address this issue, sentinel surveillance was carried out in 2013 in Anhui, Henan, Zhejiang and Shaanxi provinces. At the same time, 13 provinces carried out screening of workers returning from abroad, and found 737 cases among 4358 persons screened. Chapter 5 analyses the challenges and needs of operational research in the NMEP. In particular, gaps were identified, which could hinder the progress of China's NMEP. Therefore, priorities for operational

research were recommended, including development of new screening tools, better diagnostic tool, entomological studies linking environmental and climate factors and integrated, multipronged strategies for malaria elimination in the People's Republic of China.

Third, Chapters 6 and 7 introduce an intervention strategy leading to transition from control to elimination phases in the lower epidemic regions, such as Shanghai, Zhejiang and Fujian provinces (Yang et al., 2014; Zhu et al., 2014). Chapter 6 reviews the surveillance strategy carried out in four pilot sites in Shanghai and Zhejiang provinces, to provide the guidelines for malaria elimination assessment at the national level. Chapter 7 presents the experiences with surveillance and response in the malaria postelimination phase in Fujian province, where no local case has been detected since 2002.

Fourth, there were many instances of malaria resurgence in different parts of the world historically following a period of successful suppression of malaria transmission. This is most often the result of a subsequent weakening of control programmes (Cohen et al., 2012). Chapters 8, 9 and 10 examine how programme managers in China can prepare for resurgence in the postelimination phase. Chapter 8 examines what can happen when malaria re-emerges after successful elimination (Zhang et al., 2014). There was a serious outbreak of vivax malaria in 2006 in the Huang-Huai plain in Central China. It was subsequently controlled with mass drug administration and case management. Chapters 9 and 10 examine imported malaria from Southeast Asia and Africa as a potential cause of resurgence (Feng et al., 2014a; Qian et al., 2014). The chapters draw a number of lessons to avoid future outbreaks with a particular emphasis on aggressive screening, ongoing malaria education and maintaining the ability to mount rapid responses.

Finally, as in many countries in the world, successful efforts in malaria control and elimination depend critically on strong intersectoral collaborations, clear intervention strategies supported by efficient health information systems, active involvement of communities and innovative operational research. Success stories described in Chapter 11 were gleaned from five projects supported by the Global Fund. With the efficient use of resources provided by the Global Fund, China has successfully transitioned from malaria control to malaria elimination (Wang et al., 2014). Therefore, China's considerable success in malaria control over the past 60 years presents opportunities to transfer knowledge to the African countries that are still faced with a significant burden of the disease. Chapter 12 examines knowledge transfer opportunities, especially in diagnostic systems, drug

delivery systems, improved reporting and related capacity building (Xia et al., 2014a). However, a well-coordinated, culturally sensitive approach is needed. China's experience suggests that pilot projects are the best way to test the transfer of the Chinese experience to the African context.

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