

Qiyong Liu, China CDC's Chief Expert of Vector Control

Peter Hao^{1,✉}; Yu Chen^{2,✉}; Zhenjun Li¹; Jingjing Xi^{1,✉}; Feng Tan^{1,✉}



Qiyong Liu is a leading expert and scientist for vector surveillance and control and leads national research on health and climate change in China. Qiyong Liu heads the World Health Organization (WHO) Collaborating Centre for Vector Surveillance and Management (WHOCVSM) and has been awarded over 20 national and international prestigious grants including the following: National Basic Research Program of China (973 Program), the National Natural Science Foundation of China (NSFC), National Programs for Science and Technology Development, Australian Agency for International Development (AusAID), China Prosperity Strategic Programme Fund (SPF), and Wellcome Trust. His ability to build

collaborations between influential multidisciplinary partners has yielded strong results and has led to his recognition with the Australia China Alumni of the Year Award 2019.

Qiyong Liu completed his undergraduate study at the Department of Biology of Shandong University in 1985, one of China's top universities, before continuing to Beijing to start work at the Department of Vector Biology and Control (DVBC), Institute of Epidemiology and Microbiology (IEM), Chinese Academy of Preventive Medicine (CAPM). Following the establishment of China CDC in 2002, this institution was renamed the National Institute for Communicable Disease Control and Prevention of China CDC. During this time, Qiyong Liu went abroad to Griffith University in Australia where he obtained a Master of Sciences in Public Health from 2004–2006 and a PhD from 2013 to 2014 in climate change and mosquito-borne disease. Combined, Qiyong Liu has more than 35 years of experience in public health and research.

With expertise in zoology, ecology, epidemiology, microbiology, and immunology, Qiyong Liu has dedicated himself to public health research with a focus on the control of disease vectors and vector-borne diseases and assessing climate-change-related health risks and adaptation. He has already become a renowned influential public health leader of global significance through his important roles and appointments in various international affairs and projects such as the 8th Communication for Leadership and Management Program, WHO Western Pacific Regional Office (WPRO; 2001–2002) in the Philippines, and the WHO consultant for vector control — responsible for risk assessment and control planning of vector borne disease in tsunami-affected area in Sri Lanka (2005) — a Medical Officer (STP) of the Communicable Disease Surveillance and Response, WHO WPRO (2007–2008), a Member of the Global Vector Control Standing Committee (GVCS) of the WHO, a Trustee of Innovative Vector Control Consortium (IVCC), and the Executive Chair of International Forum for Sustainable Vector Management (IFSVM) since 2006.

Prof. Cordia Chu, Director of the Centre for Environment and Population Health at Griffith University, supervised Qiyong Liu's Master and PhD research programs. Prof. Chu has highly recognized Liu's scientific achievements, especially his great efforts in the response to public health threats due to rapid changes in the transmission patterns and trends of vector-borne diseases (e.g., dengue, Zika, Chikungunya, Yellow fever) under the climate change scenarios. She described that *"His innovative, comprehensive, and ecological approach has greatly facilitated the sustainable management of vector-borne diseases, from effective surveillance for early warnings, to risk assessments, development of appropriate response strategies, community education, and mobilizing community participation. His expertise and contributions in public health-related policy making are far-reaching, and his research has provided important evidence to national and local governments in the development and improvement of public health systems and the prevention and control of vector-borne disease outbreaks, particularly during and after natural disasters."*

Given that vector surveillance is the key basis of vector-borne diseases control, Qiyong Liu has worked hard to promote the development of China's vector surveillance system from the manual recording and printing of reports to the current national surveillance systems that use the internet and big data. The manual paper-based system in 1985 was based on 4 pests nationwide, and recognizing the challenges and gaps that arrived with the 21st century,

Qiyong Liu developed the current system and put forward a sustainable vector management (SVM) strategy in 2004. The SVM innovations lie in the strategic transition from outbreak response to outbreak risk reduction for dengue in China. However, vector control for disease prevention requires broad international collaboration, and Qiyong Liu saw this need and established the IFSVM in 2006 to facilitate international communication and exchange. To lead and coordinate the global community and collaborative efforts, Qiyong Liu was then designated the head of the WHOCCVSM in October 2012. Since then, he has continued to develop constructive policies, guidelines, and innovative inventions to prevent and control vectors and vector-borne diseases. These works have been continuously referenced and recirculated by the WHO headquarters and the WHO WPRO.

Filling gaps in knowledge for the prevention and control of vectors and vector-borne diseases requires not only sophisticated quantitative modeling, precise scientific laboratory testing and assessments, and fieldwork in challenging conditions. To address these issues, Qiyong Liu has conducted research in hazardous and extreme environmental conditions and locations to collect and study disease-carrying vectors such as mosquitoes, ticks, and rodents. His research work in Southeast Asia, parts of Africa, and North America exposed him to multiple infectious agents, and his continued risk-taking reflects his commitment and passion to the field.

Qiyong Liu has frequently been deployed by the Chinese national government to provide expert advice to guide local governments, healthcare practitioners, and epidemiologists in the aftermath of natural disasters within in China and also as a WHO consultant to help countries to respond to emergencies or outbreaks to develop prevention strategies and control measures. So far, Qiyong Liu has helped over 40 countries in their responses including vector control and infectious disease prevention in tsunami-affected areas in Sri Lanka, dengue and Zika control in Southeast Asia and South America, infectious disease prevention after the Sichuan Province Earthquake, malaria reductions in Sierra Leone, and Chikungunya fever in Mauritius.

Qiyong Liu's pioneering and persistent work has been repeatedly recognized throughout the world. His integrative, innovative model for SVM, for instance, has been known in the international research community as "the Chinese Model" for control strategies for *Plasmodium vivax* malaria and dengue in varying scenarios. Qiyong Liu continues to work on improving existing strategies and developing new strategies as the chief expert in vector surveillance and control at China CDC.

doi: 10.46234/ccdcw2020.160

Corresponding authors: Jingjing Xi, xijj@chinacdc.cn; Feng Tan, tanfeng@chinacdc.cn.

¹ Chinese Center for Disease Control and Prevention, Beijing, China; ² National Institute of Environmental Health, Chinese Center for Disease Control and Prevention, Beijing, China.

[§] Joint first authors.

Submitted: July 15, 2020; Accepted: July 24, 2020