johb.info



Editorial

One Health Bulletin

Chikungunya crisis: Reinforcing One Health defenses against ecological pandemics

Jiahai Lu[1,2,3,4,5]✉

[1]*One Health Research Center, Wenzhou Medical University, Wenzhou 325035, China*

[2]*Zhejiang One Health Collaborative Innovation Center, Wenzhou 325035, China*

[3]*One Health Research Center, Hainan Medical University, Haikou 571199, China*

[4]*One Health Research Center, Baotou Medical College, Baotou 014040, China*

[5]*One Health Center of Excellence for Research and Training, School of Public Health, Sun Yat-sen University, Guangzhou 510080, China*

On July 8, 2025, a local outbreak of chikungunya, initiated by an imported case, was detected in Shunde District, Foshan City, Guangdong Province, China. Within 18 days, the number of confirmed cases surpassed 4 000[1]. This sudden outbreak highlighted the critical threat posed by vector-borne infectious diseases, which are not only as public health challenges but also as indicators of ecological imbalance. Compared with traditional zoonotic diseases, the prevention and control of vector-borne diseases, such as dengue, Zika, and chikungunya, has become significantly more complex. Specifically, traditional zoonotic diseases can often be managed through interventions such as restricting wildlife trade and regulating the livestock industry, whereas vector-borne diseases are intricately linked to ecological systems. Accumulated rainwater provides breeding habitats for mosquitoes, global warming expands the geographical reach of disease vectors, urbanization introduces artificial water bodies, and carbon emissions exacerbate disease transmission cycles. These factors collectively form an ecological infectious disease network involving "Environment-Animals-Climate-Human". Therefore, the challenge we face extends beyond a single virus or disease; it reflects an imbalance within the entire ecosystem.

Although deaths caused by chikungunya virus are uncommon[2], severe infections may result in encephalitis and encephalopathy, myocarditis, hepatitis, and multiple-organ system failure[3]. Therefore, it is crucial to remain vigilant, respond proactively, and make plans ahead. Our team has long been committed to advocating and practicing One Health, and has conducted systematic and comprehensive research on arthropod-borne infectious diseases such as chikungunya and dengue. In terms of disease early warning and monitoring, from 2016 to 2017, we carried out monitoring and screening for dengue, chikungunya, Zika, and malaria among international travelers arriving at Guangzhou Baiyun International Airport in China. The study revealed that overseas travel, as well as living or working abroad, were the primary risk factors associated with dengue and malaria among Chinese nationals. Furthermore, individuals diagnosed with these four mosquito-borne diseases were more likely to exhibit neurological, musculoskeletal, and dermatological symptoms and signs compared to patients with other febrile illnesses[4]. In the field of rapid disease diagnosis, we innovatively identified a novel IgM-specific linear epitope on the E2 protein for the serological diagnosis of chikungunya. Moreover, the indirect peptide ELISA we established has a significantly greater sensitivity in detecting clinical samples than commercial kits, thus complementing and improving existing IgM antibody detection methods[5]. In the field of novel vaccine development, we have successfully designed and characterized a multivalent thermostable scaffold based on lumazine synthase small ubiquitin-like modifier and a divalent nanovaccine covalently conjugated with chikungunya virus (CHIKV) E2 and Zika virus EDIII antigens[6]. In parallel, through the screening of a natural camel-derived phage library, we have identified multiple nanobodies specifically targeting CHIKV nonstructural protein 2. Our findings demonstrate that these nanobodies are capable of inhibiting early viral replication, thereby establishing a critical foundation for further investigation into the functional roles of CHIKV nonstructural protein 2 as well as the development of targeted therapeutic interventions[7].

To prevent and respond to new challenges posed by ecological infectious diseases, we should implement the One Health strategy. We held three international conferences on One Health in 2014, 2019 and 2025. The first conference, which was held in China in 2014 established a global network of One Health researchers. The

✉To whom correspondence may be addressed. E-mail: lujiahai@mail.sysu.edu.cn

This is an open access article distributed under the terms of the Creative Commons Attribution-Non-Commercial-No Derivatives License 4.0 (CCBY-NC-ND), where it is permissible to download and share the work provided it is properly cited. The work cannot be changed in any way or used commercially without permission from the journal.

For reprints contact: reprints@medknow.com

©2026 *One Health Bulletin* Produced by Wolters Kluwer- Medknow.

How to cite this article: Lu JH. Chikungunya crisis: Reinforcing One Health defenses against ecological pandemics. One Health Bull 2026; 6(3): 101-102. doi: 10.4103/ohbl.ohbl_58_25

Article history: Received 26 July 2025 Revision 27 July 2025
Accepted 27 July 2025 Available online 31 July 2025

2019 conference further strengthened this cooperation and eventually formed the "Pearl River Declaration". This declaration called for enhanced regional cooperation to address health threats in the Asia-Pacific region[8]. The 2025 conference focused on key technological research and practice of One Health and formed the "Pengcheng Declaration"[9].

For vector-borne infectious diseases such as chikungunya, it is essential to establish a One Health defense framework. Specifically, priority should be given to promoting early warning and predictive technologies, integrating satellite remote sensing and vector gene sequencing for real-time early warning. Regarding vaccine and drug development, currently only one CHIKV vaccine (IXCHIQ by Valneva)[10] is available worldwide and it is not yet available in China. China should accelerate the research and development of new vaccines such as mRNA, and the listing process of viral vector vaccines, and actively carry out the research and development of specific antiviral drugs. Special attention should be paid to environmental medical engineering construction, implementing "mosquito-free building standards" in urban planning. In addition, comprehensive monitoring of animal hosts should be conducted, alongside screening the evolutionary dynamics of viruses carried by primates and birds. Finally, regarding global collaborative governance, we should jointly build a "Belt and Road" vector joint prevention and control belt. A mosquito-free community is not a utopia, but a modern public health project based on the One Health strategy.

Conflict of interest statement

The author, Professor Jiahai Lu, serves as the Editor-in-Chief of *One Health Bulletin*. The views expressed are his own and do not necessarily represent the view of the *Journal*. To ensure the integrity and impartiality of the peer review process, this manuscript was handled and reviewed independently by the journal's editorial team, with no involvement from Professor Lu. The author declares no other competing interests.

Funding

This study received no extramural funding.

Disclaimer

The author contributed to this article in his personal capacity. The views expressed are his own and do not necessarily represent the view of the institutions he is affiliated with.

Data availability statement

The data supporting the findings of this study are available from the corresponding author upon request.

References

[1] Xuhou Chen. *The number of Chikungunya fever cases in Foshan has exceeded 4,000, and cases have emerged in Guangzhou, Yangjiang, Zhanjiang and other places*. [Online] Available from: https://www.thepaper.cn/newsDetail_forward_31247988. [Accessed on 26th July 2025]. (in Chinese)

[2] World Health Organization. *Chikungunya*. [Online] Available from: https://www.who.int/news-room/fact-sheets/detail/chikungunya. [Accessed on 26th July 2025].

[3]Burt FJ, Chen W, Miner JJ, Lenschow DJ, Merits A, Schnettler E, et al. Chikungunya virus: An update on t*he* biology and pathogenesis of this emerging pathogen. *Lancet Infect Dis* 2017; **17**(4): e107-e117.

[4] Feng X, Sun W, Birkhead GS, Wang XZ, Guo ZM, Lu JH. The surveillance of four mosquito-borne diseases in international travelers arriving at Guangzhou Baiyun International Airport, China, 2016-2017. *Travel Med Infect Dis* 2019; **32**:101513.

[5]Li QL, Dai J, Shi YX, Deng Q, Liao CH, Huang JC, et al. IgM-specific linear epitopes on the E2 protein for serodiagnosis of chikungunya. *Virus Res* 2024; **339**:199292.

[6] Li QL, Zhang JS, Deng Q, Liao CH, Qian J, Chen ZL, et al. A divalent chikungunya and Zika nanovaccine with thermostable self-assembly multivalent scaffold LS-SUMO. *Adv Healthc Mater* 2024; **13**(13): e2303619.

[7] Deng Q, Guo Z, Hu H, et al. Inhibition of chikungunya virus early replication by intracellular nanoantibodies targeting nsP2 Epitope Rich Region. *Antiviral Res* 2022; **208**: 105446.

[8] Deng Q, Lu JH. One health and human health. *Sci Bull* 2022; 6**7**: 37-46. (in Chinese)

[9] Wenzhou Medical University. *Wenzhou Medical University Leads Global "One Health" Governance New Practice–2025 International Symposium Facilitates the Implementation of the "Pengcheng Declaration"*. [Online] Available from: https://news.wmu.edu.cn/show/2/41824.html. [Accessed on 26th July 2025].

[10]Valneva. *Valneva's single–shot chikungunya vaccine–IXCHIQ®/ VLA1553*. [Online] Available from: https://valneva.com/research-development/chikungunya/. [Accessed on 26th July 2025].

Publisher' s note

The Publisher of the *Journal* remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Edited by Qi Y, Liang TC