



GLOBAL INFECTIOUS DISEASES REPORTS

Global Status of Infectious Diseases from January to June of 2025

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Abstract

In the first half of 2025, cholera, mpox, measles, dengue fever, chikungunya, malaria, and Zika virus spread globally, and severe outbreaks occurred in the Democratic Republic of the Congo (DRC) and Afghanistan. The primary drivers were enhanced pathogen adaptability and healthcare system vulnerabilities. These diseases showed remarkable spatial heterogeneity and dynamic evolution, influenced by climate, healthcare resources, and vector control. Temperature and precipitation played major roles in mosquito-borne disease transmission, and rising temperatures and altered precipitation patterns extended the zones of vector suitability. Four major challenges in arboviral disease control are summarized herein: vector ecology complexity, diagnostic-therapeutic access disparities, fragility of public health infrastructure, and climate-driven transmission expansion. Future prospects and recommendations include enhancing international cooperation, innovating prevention and control technologies, boosting public health system capacity, and addressing climate change to decrease the risk of mosquito-borne disease transmission.

Keywords: Global Infectious Diseases, Healthcare Systems, Climate Change, Vector Control

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INTRODUCTION

In recent years, global infectious disease control has faced complex and severe challenges. Among these diseases, influenza virus, cholera, mpox, and measles have garnered widespread attention. These diseases, characterized by high infectivity and mortality rates, pose severe threats to human health and global public health security. The influenza virus frequently undergoes mutation, thus leading to the continual emergence of new strains and high incidence of infection [1]. Cholera, caused by *Vibrio cholerae*, spreads primarily through contaminated water and food, and severe cases can result in dehydration and even death [2]. The incidence

of mpox, which is transmitted through close contact and respiratory droplets, has increased in recent years. Measles, a highly contagious viral disease, affects primarily children and can cause severe complications. The transmission of these diseases is influenced by various factors, such as climate change, population mobility, and disparities in healthcare systems, thereby posing major challenges to global infectious disease prevention and control.

Mosquito-borne diseases, such as dengue fever, chikungunya, malaria, and Zika virus disease, have also gained broad attention. These diseases are endemic to tropical and subtropical regions but have spread to other areas through international

travel and trade, and currently pose major threats to global public health security.

Dengue fever, chikungunya fever, Zika virus disease, and malaria are transmitted primarily through mosquito bites. The main vectors for these diseases are *Aedes* mosquitoes (which transmit dengue, chikungunya, and Zika virus) and *Anopheles* mosquitoes (which transmit malaria). These mosquitoes are found predominantly in tropical and subtropical regions. In early stages of infection, all four diseases elicit similar symptoms, including fever, headache, and muscle and joint pain [3].

To enhance the visualization of the geographical distribution and patterns of infectious disease development, we used Shusi Tech's Global Epidemic Information Monitoring System to perform a systematic and comprehensive analysis of the five most prevalent global infectious diseases from January to June of 2025 FIGURE 1 (Fig 1).

Influenza outbreak

In 2025, the number of seasonal influenza cases reached a record high. As of early May, an estimated 480,000 confirmed influenza cases had been reported in the United States, more than 96% of which were influenza A. The 19,000 recorded influenza-related deaths surpassed

the number of deaths attributed to winter COVID-19 for the first time. Canada also experienced a substantial increase in influenza infection rates. Particularly in February and March, the number of new weekly influenza cases in Canada reached tens of thousands and far exceeded the peak observed in the 2023–2024 flu season. According to statistics from the Public Health Agency of Sweden, as of April 20, 2025, approximately 23,000 people in Sweden had been diagnosed with influenza, and the average weekly increase exceeded 1,000 new infections. Additionally, cases of respiratory syncytial virus and SARS-CoV-2 infections in Sweden are also increasing. Meanwhile, as influenza cases continue to increase in other European countries and across Asia, the influenza epidemic is a global concern.

Cholera outbreak

The Global Cholera Outbreak Overview for 2025 indicated a severe surge in Africa (Fig 2). In Angola, the number of cases increased from 14,090 (505 deaths) in April to 26,723 (751 deaths) by June, and resulted in a high case fatality rate (CFR) of 2.8%. Additionally, the Democratic Republic of the Congo (DRC) reported substantial numbers: the world health organization (WHO)

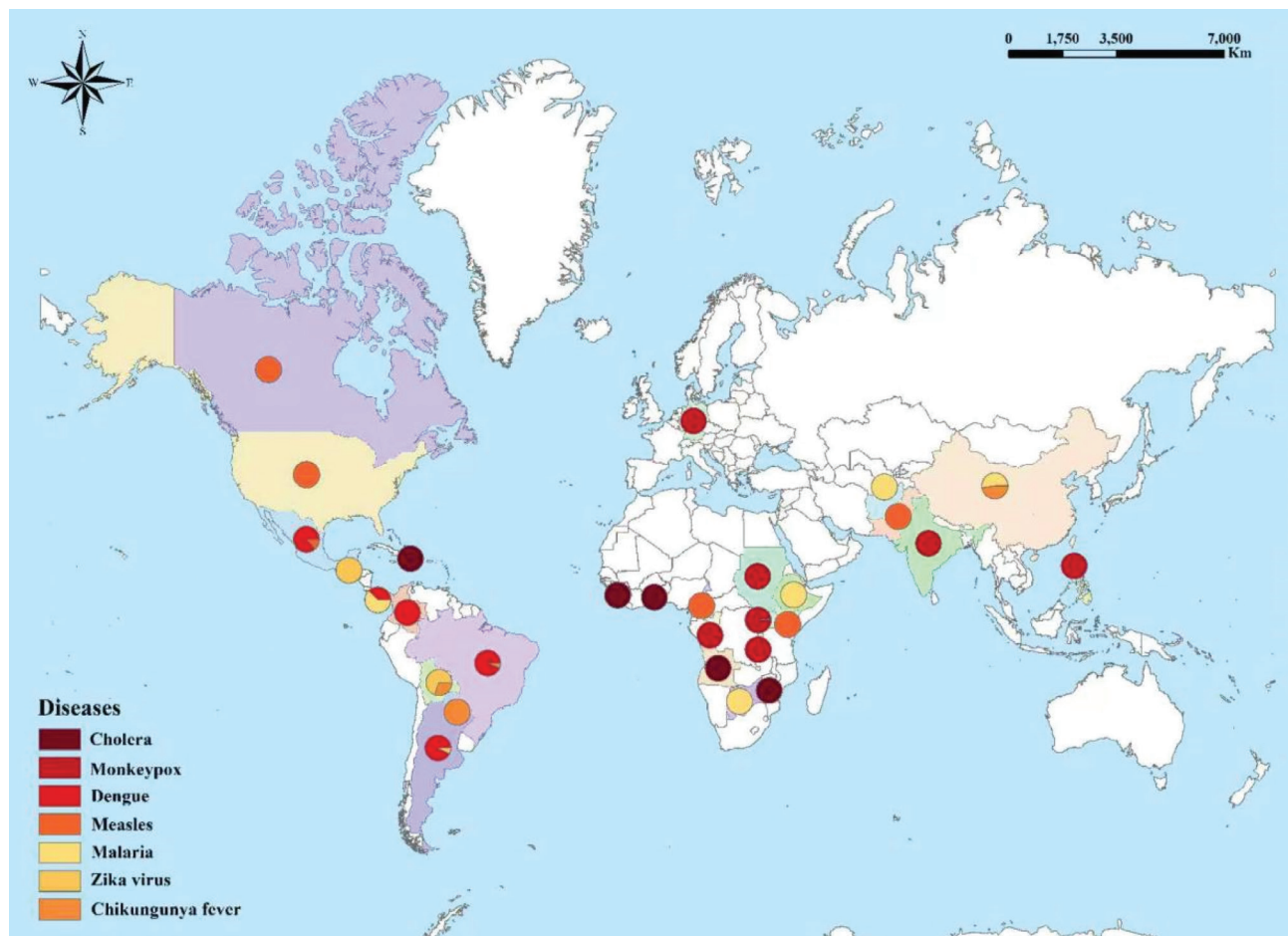


FIGURE 1 | Global distribution of the seven most prevalent infectious diseases from January to June 2025.

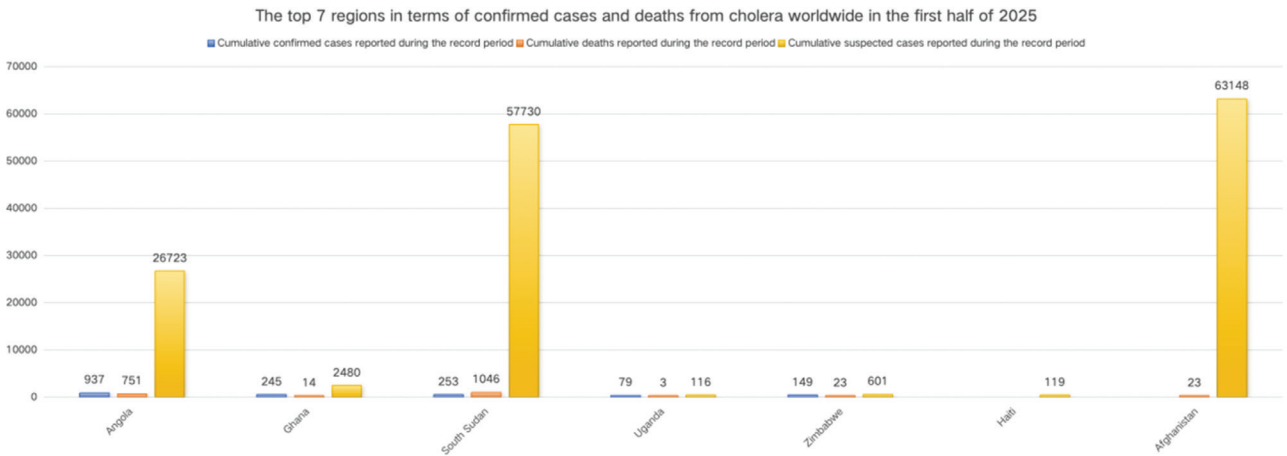


FIGURE 2 | Top seven regions in terms of confirmed cholera cases and deaths worldwide in the first half of 2025.

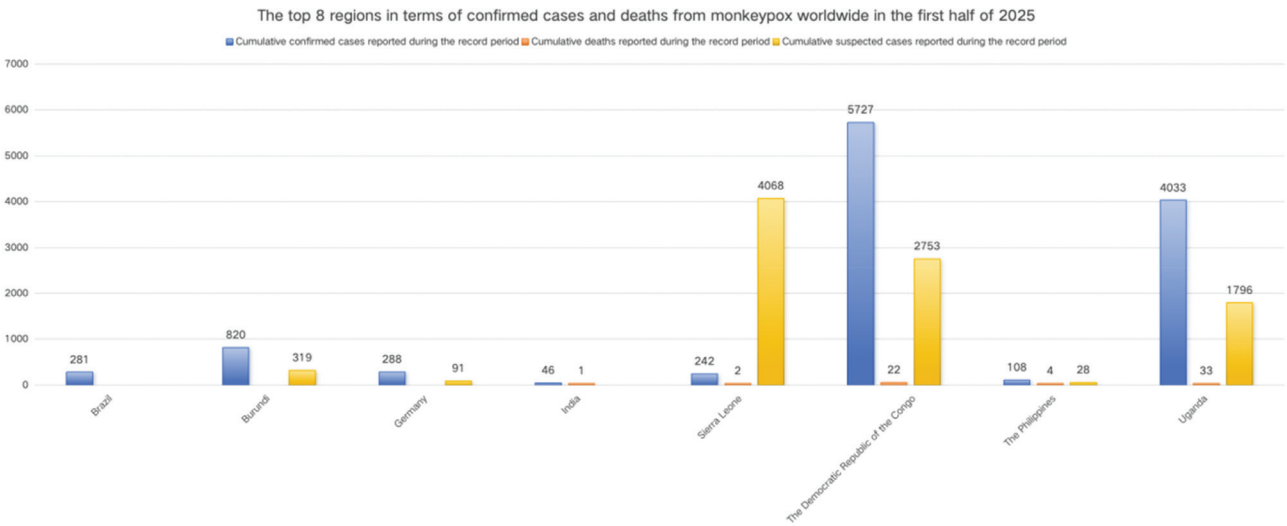


FIGURE 3 | Top eight regions in terms of confirmed mpox cases and deaths worldwide in the first half of 2025.

recorded 27,008 cases and 576 deaths from January to May 2025, and by June, the country had recorded 57,730 cases and 1,046 deaths (CFR: 1.81%). Similarly, South Sudan reported 57,730 cases and 1,046 deaths by June 2025 (CFR: 1.81%). Multiple disease outbreaks across Africa were driven largely by poor sanitation and limited access to clean water. Notably, Afghanistan experienced a surge from 46,461 to 63,148 cases by June 2025 yet maintained a strikingly low CFR of 0.04%. Meanwhile, Haiti continued to battle endemic cholera and recorded 89,966 cumulative cases since 2022; the weekly case numbers fluctuated between 16 and 42 in mid-2025, thereby reflecting cyclical transmission amid persistent funding shortfalls for water infrastructure.

Mpox outbreak

In the global mpox outbreak in 2025, transmission escalated in Africa (Fig 3). The DRC has remained the epicenter. By April 2025, 5,727 cases and 22 deaths (CFR: 0.4%) were

reported, and the monthly case number increases exceeded 1,000, because of intensified human-to-human spread through household contact. Furthermore, Uganda experienced rapid community transmission: the WHO documented 4,033 cases and 33 deaths by April, and the number of cases surged to 1,171 between mid-March and early April. Subsequently, Sierra Leone experienced a concerning rise to 4,068 cases from May to June, which was accompanied by increasing fatalities. Beyond Africa, sporadic infections emerged globally. The United States reported 156 cases by May 2025, whereas Germany recorded 146 cases by March and 142 additional cases by May, thereby indicating local transmission alongside travel-related introduction. Additionally, Brazil documented 281 cases by March and 66 new cases in May.

Measles outbreak

The Global Measles Outbreak Overview in 2025 highlighted widespread transmission (Fig 4). Cameroon

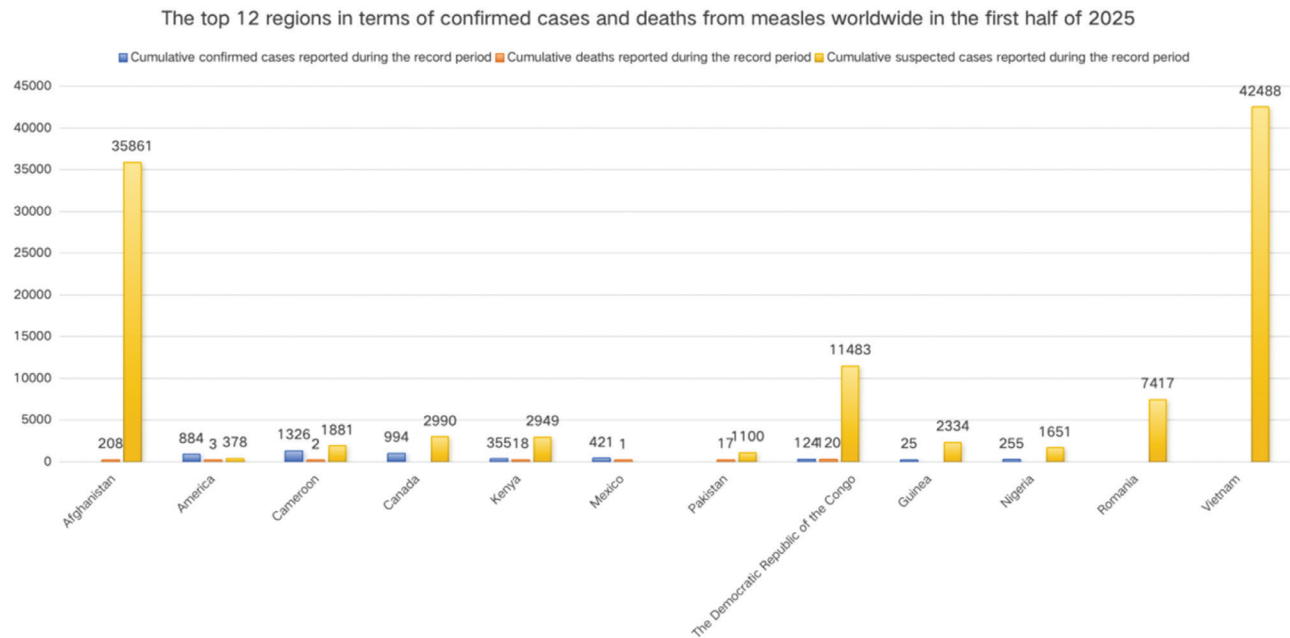


FIGURE 4 | Top 12 regions in terms of confirmed measles cases and deaths worldwide in the first half of 2025.

reported 1,881 cases by June 2025, and a peak of 413 new cases in a single week, thus reflecting rapid community spread. Concurrently, the DRC documented 8,145 cases and 104 deaths by February 2025, and the weekly surges exceeded 1,800 cases. These outbreaks were concentrated in urban areas with low vaccination coverage, particularly among children younger than 5 years. In Afghanistan, 35,861 cases and 208 deaths were recorded by May 2025 (CFR: 0.6%). Meanwhile, Vietnam faced its largest outbreak in decades and recorded 42,488 cases by March 2025. A substantial resurgence was also evident in high-income countries. Canada confirmed 2,990 cases by June 2025. Romania, the most affected country in Europe, reported 7,417 cases by May 2025, which were driven largely by vaccine hesitancy.

Dengue outbreak

According to global dengue surveillance data for 2025, more than 2 million suspected cases and more than 1,000 deaths were reported cumulatively from January to June, thus resulting in an overall case-fatality rate of 0.14%. In South America, Brazil reported the highest number of cases (more than 1.867 million cases and 703 deaths; Fig 5). During the last week of April, Brazil saw a surge of 150,000 new cases in a single week. In May, the new cases in a single week reached an alarming 288,000 cases. Other countries in the region also reported substantial numbers: Argentina reported 10,700 cases, Colombia reported 52,900 cases and 27 deaths, and Peru reported 29,100 cases and 33 deaths.

In Southeast Asia, Indonesia reported 42,700 cases and 173 deaths. Sri Lanka recorded 14,800 cases from January to April, and from May to June, the number of new cases

per week exceeded 1,300. Thailand reported 6,267 cases from January to February, and in May alone, the number of new cases reached 4,683. Other active regions included Pakistan, which reported 1,293 cases, and Sudan, which reported 1,441 cases.

Chikungunya outbreak

In the first half of 2025, global surveillance data indicated that the cumulative number of reported chikungunya fever cases exceeded 200,000. Brazil experienced the most severe outbreak, and reported more than 100,000 cumulative cases and more than 50 deaths (Fig 6). Other substantially affected countries in South America included Argentina (>2,000 cumulative cases), Bolivia (>300 cases), and Peru (>50 cases). France, the European epicenter, reported more than 39,000 cumulative cases. In Asia, a limited number of imported cases were reported in Taiwan Province, China, whereas no large-scale local transmission has been documented to date.

Malaria outbreak

Africa remained the global epicenter of malaria transmission during the first half of 2025 (Fig 7). Ethiopia, Kenya, and Namibia collectively reported more than 2.7 million suspected cases, which accounted for most global cases. Notably high case fatality rates were observed, particularly in Namibia and Kenya. Ethiopia experienced a peak transmission period between January and April. In a single week in April, 115,716 new cases, representing 43% of Africa's total cases during that period, and more than 100 deaths, were reported. The case numbers began to slowly decline after May. In Asia, Afghanistan reported the most severe outbreak, and the cumulative number of cases exceeded 15,000

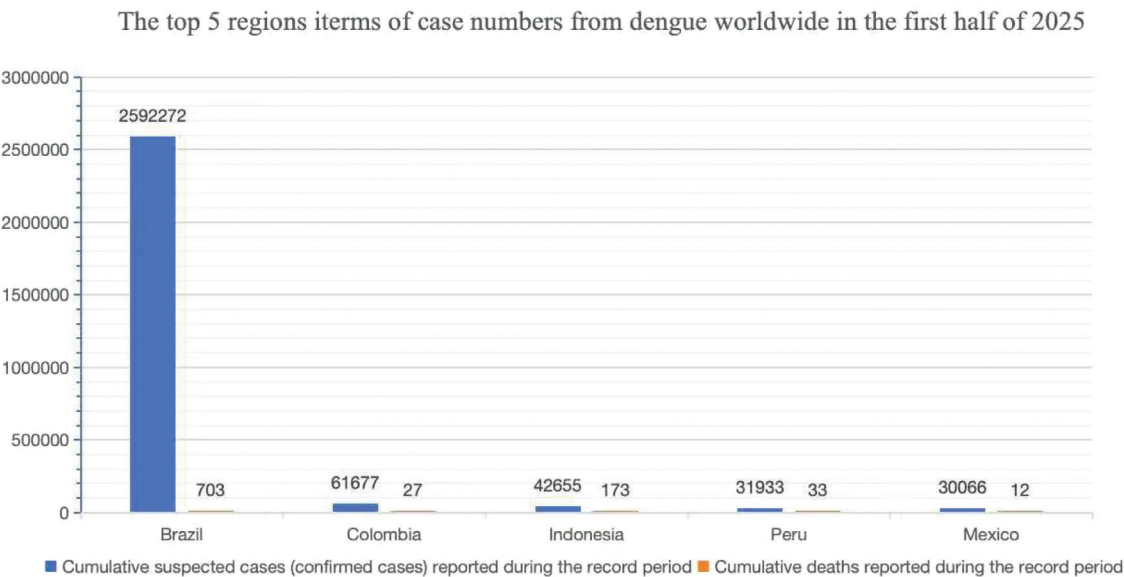


FIGURE 5 | Top five regions in terms of dengue case numbers worldwide in the first half of 2025.

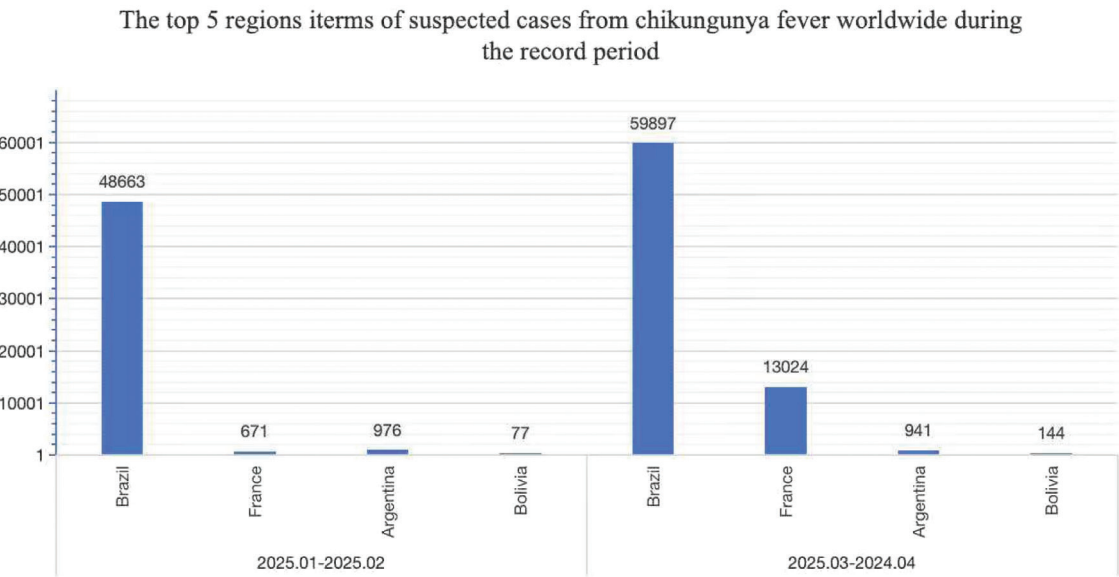


FIGURE 6 | Top five regions in terms of suspected chikungunya fever cases worldwide during the record period.

by the end of June. Between March and June, transmission accelerated and culminated in 1,838 new cases weekly. In the Americas, Panama reported the highest burden, comprising more than 6,000 cumulative cases in the 6-month period. Transmission persisted through May and June, and the number of weekly new cases consistently exceeded 50.

Zika virus outbreak

From January to June 2025, the Zika virus spread across seven countries in the Americas and Africa, and was responsible for more than 8,500 cumulative reported cases, including 657 laboratory-confirmed cases and two deaths (both in Brazil) (Fig 8). Argentina, Bolivia, and

Brazil reported the most cases, accounting for 98.2% of global cases, thus indicating continued Zika virus activity in South America. Brazil recorded 7,714 suspected cases (92.1% of global cases), 637 confirmed cases, and two deaths, and therefore was the primary focus of the outbreak. The epidemic peaked from March to April (summer and autumn in the Southern Hemisphere), in alignment with the epidemic patterns of mosquito-borne diseases.

Scattered infectious diseases

In addition to the aforementioned infectious disease epidemics, numerous other cases were reported globally (details in S1 Table).

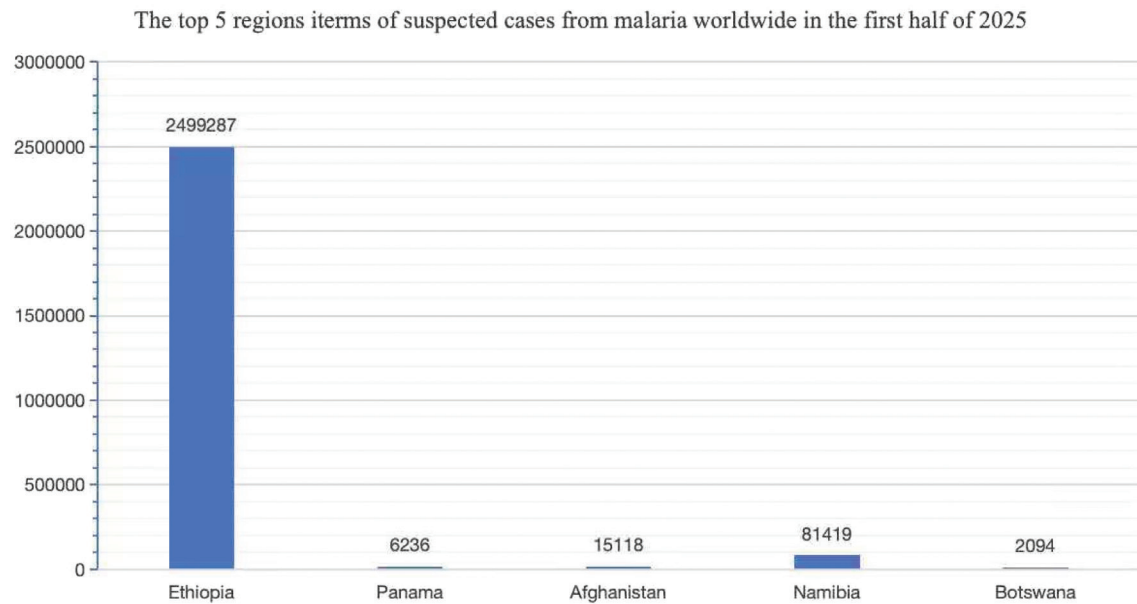


FIGURE 7 | Top five regions in terms of suspected malaria cases worldwide in the first half of 2025.

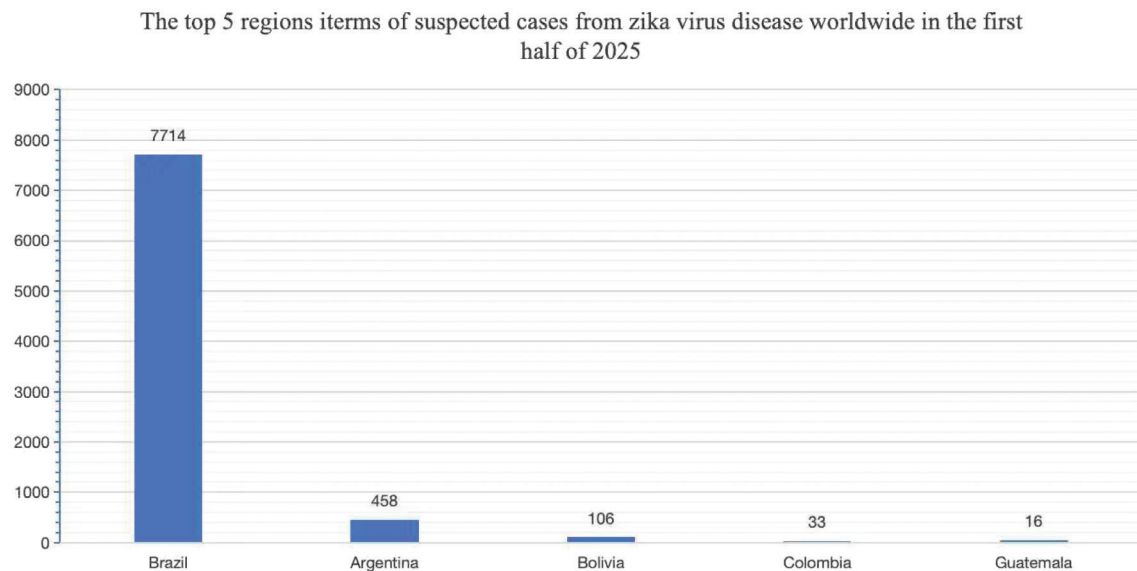


FIGURE 8 | Top five regions in terms of suspected Zika virus disease cases worldwide in the first half of 2025.

DISCUSSION

During the first half of 2025, cholera, mpox, and measles continued to spread globally. Particularly severe outbreaks were observed in the DRC and Afghanistan. The primary drivers of these outbreaks were enhanced pathogen adaptability and vulnerabilities within healthcare systems [4, 5]. Specifically, mpox and measles primarily spread through skin contact. Their high viral adaptability enabled rapid transmission among immunologically vulnerable populations, particularly children and local populations with low herd immunity. In addition, these diseases triggered

heterogeneous host immune responses. This complexity made early diagnosis difficult and hindered effective isolation measures. Concurrently, resource-constrained regions such as the DRC and Afghanistan faced compounded crises. Insufficient medical infrastructure accelerated the spread of these diseases [6]. Meanwhile, in developed countries, waning vaccine-induced herd immunity led to a resurgence of previously controlled diseases. These factors underscore the urgent need for governments to implement scientifically based vaccination programs.

In the first half of 2025, global infectious diseases such as dengue fever, chikungunya, malaria, and Zika virus

showed remarkable spatial heterogeneity and dynamic evolution. Dengue fever cases were highly synchronized with the rainy season in Southeast Asia. Brazil, the core of the dengue and chikungunya epidemics, recorded more than 1.86 million dengue cases by April and accounted for more than 80% of global chikungunya cases. Non-traditional epidemic areas such as Germany also reported more than 1,000 dengue cases, thus suggesting cross-continental spread risks. Malaria remained a major challenge in Africa, Asia, and Latin America. Zika virus transmission remained active in the Americas, particularly in Brazil and Argentina, and some African regions also reported cases. These epidemics were affected by factors such as climate, healthcare resources, and vector control. The co-infection rate of dengue and chikungunya in South America exceeded 90%.

Temperature and precipitation play major roles in mosquito-borne disease transmission. Rising temperatures and altered precipitation patterns extended vector suitability zones. *Aedes* and *Anopheles* mosquitoes have been found to thrive in warm, humid conditions (optimal temperature 26–32°C) [3]. Higher temperatures and humidity increase mosquito numbers and the incidence of mosquito-borne diseases, because heat accelerates viral replication in mosquitoes, shortens the extrinsic incubation period, and increases the chance of transmission. Consequently, average temperature is positively associated with the incidence of these diseases.

Heavy rainfall can decrease mosquito-borne disease transmission by flushing away standing water and larvae, decreasing mosquito numbers, and lowering environmental temperatures. Therefore, heavy rainfall might lower the incidence of such diseases [3]. These findings highlight the critical importance of controlling mosquito populations as a key preventive measure against these diseases. Given that climate change is increasing global temperatures, the incidence of mosquito-borne diseases is likely to rise.

Four challenges in arboviral disease control are summarized as follows.

1. Vector ecology complexity: The reproductive dynamics and activity patterns of primary *Aedes* vectors are modulated by multidimensional factors, including climatic gradients and habitat modification. In insecticide resistance hotspots (e.g., Southeast Asia and Latin America), the evolution of vector resistance has markedly compromised the efficacy of conventional chemical interventions and created critical control bottlenecks.
2. Diagnostic-therapeutic access disparities: Endemic areas, particularly resource-constrained remote regions, face dual barriers of inadequate diagnostic network coverage and antiviral drug shortages. Delayed case identification and treatment gaps accelerate community transmission chains, and substantially increase the rates of severe disease progression and mortality.
3. Fragility of public health infrastructure: Structural deficiencies in affected countries, including fragmented surveillance systems, workforce shortages, and emergency

equipment deficits, can result in delayed outbreak detection and suboptimal response efficiency during emerging arboviral outbreaks.

4. Climate-driven transmission expansion: Rising temperatures and altered precipitation patterns substantially extend vector suitability zones.

Future prospects and recommendations are as follows. (1) Enhance international cooperation: Controlling mosquito-borne viral diseases requires global efforts. International organizations such as WHO and UNICEF should continue to coordinate and promote cooperation and resource sharing among countries. (2) Innovate prevention and control technologies: Developing and promoting new antiviral drugs, vaccines, and insecticides is crucial. R&D and applications of novel antiviral drugs and vaccines must be accelerated. In addition, advanced technologies, such as gene editing and biotechnology, should be used to create new control tools. For example, breeding non-blood-sucking mosquitoes that prey on *Aedes* mosquitoes would enhance mosquito-based biocontrol. (3) Increase public health system capacity: Public health systems in virus-prevalent countries should be strengthened, and their ability to monitor, diagnose, and treat mosquito-borne diseases should be improved. These goals could be achieved by training professionals, providing advanced equipment, and enhancing disease-surveillance systems. In addition, public health education is necessary to increase awareness regarding the risks and prevention of mosquito-borne diseases. (4) Address climate change: Close monitoring of the environment, improving sanitary conditions, and adjusting agricultural practices are necessary to decrease the risk of mosquito-borne disease transmission.

CONCLUSION

In our currently, infectious diseases can spread worldwide rapidly. To prevent the spread of the aforementioned infectious diseases in the Northern Hemisphere, particularly from July to August, high vigilance and proactive measures are necessary.

ETHICS STATEMENT

No direct interactions with human or animal subjects were involved. Therefore, ethical approval and informed consent were not required.

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Dayong Gu conceived and designed the project. The data were collected by Xiang Guo, Qi Xiang, and Yan Wu, and were sorted by Lin Lin and Dongliang Liu. The figures and chart were made by Taihan Li and Yi Luo. The manuscript was written and revised by Guodan Li and Yinfu Sun. Dayong Gu and Wenjin Yu supervised the study. This research was supported by the National Key Research and Development Program of China (No. 2022YFC2302700), Guangdong Science and Technology Foundation (Nos. 2021A1515220084 and 2020B1111160001), and Shenzhen Science and Technology Foundation (ZDSYS20210623092001003, GJHZ20200731095604013, JSGG20220301090003004, and GJHZ20210705142007022).

CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest.

SUPPLEMENTARY MATERIAL

Supplementary Material can be downloaded from https://zoonoses-journal.org/wp-content/uploads/2025/09/zoonoses20251002_Suppl.pdf.

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