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Commentary

Emerging Zoonotic Infections: Global Trends and Regional Preparedness

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DESCRIPTION

The past two decades have seen an alarming rise in zoonotic infectious diseases that originate in animals and spill over into human populations. From Ebola outbreaks in West Africa to avian influenza in Southeast Asia and the global COVID-19 pandemic, zoonosis now accounts for more than 60% of emerging infectious diseases worldwide. These trends reflect deeper systemic issues: Environmental degradation, globalization, rapid urbanization and intensifying human animal interactions. The global trend is unmistakable. As natural habitats are destroyed for agriculture and development, wildlife is pushed into closer contact with human populations, increasing the chances of cross-species transmission. Moreover, the global trade in animals both legal and illegal facilitates the movement of potential zoonotic pathogens across continents. Climate change also plays a pivotal role, altering the migration patterns of disease vectors like mosquitoes and ticks, thus expanding the geographic range of infections like dengue, Lyme disease and chikungunya.

Despite the clear trajectory of these threats, regional preparedness remains uneven. High-income countries, particularly in North America and Europe, have invested significantly in disease surveillance systems, research infrastructure and early warning networks. Initiatives like the European Centre for Disease Prevention and Control (ECDC) and the U.S. Centres for Disease Control and prevention (CDC) have enabled swift detection and response capabilities. However, even in well-resourced settings, the COVID-19 pandemic revealed gaps in preparedness, especially in inter-agency coordination and supply chain resilience. In contrast, many Low-And Middle-Income Countries (LMICs) face structural barriers that undermine their ability to detect and contain zoonotic outbreaks. Underfunded health systems, weak laboratory infrastructure and limited veterinary surveillance are persistent challenges. However, some LMICs have made impressive strides through partnerships with global health organizations and the implementation of One Health approaches, which integrate human, animal and environmental health disciplines.

One emerging trend that merits attention is the increasing use of genomic surveillance to track zoonotic pathogens. High-income countries are leading the way in sequencing viral genomes in near-real-time to monitor mutations and predict outbreaks. While potential, this technology is largely inaccessible to poorer regions, raising ethical concerns about global equity in outbreak response. Another issue is the role of misinformation and public mistrust, which can severely hamper zoonotic disease control. Whether it involves resistance to animal culling, vaccine hesitancy or denial of government interventions, social dynamics must be accounted for in regional preparedness strategies.

Moreover, wildlife markets and agricultural intensification continue to be hotbeds for zoonotic spill over. While some countries have introduced stricter regulations, enforcement remains patchy. The global community must prioritize stricter surveillance and control of high-risk environments, including wet markets, factory farms and deforestation zones. Importantly, global health security is only as strong as its weakest link. The interconnectedness of modern society means that an outbreak in a remote village can, within days, become a global crisis. This was made abundantly clear during the COVID-19 pandemic. As such, regional preparedness must be guided by principles of global solidarity, data sharing and equitable resource distribution. Preparedness should also be proactive, not reactive. Investments in animal health systems, environmental monitoring and cross-sector training programs are critical. Institutions in high-income countries can play a major role by providing technical assistance, funding and policy support to build capacity in lower-resourced settings.

CONCLUSION

Emerging zoonotic infections are no longer a distant threat confined to isolated ecosystems; they are a pressing global reality. While the trends point to increased frequency and complexity of zoonotic outbreaks, preparedness remains highly variable across regions. High-income countries have demonstrated technological and institutional strengths, but vulnerabilities persist even in their systems. In contrast, low-resource regions face immense challenges but have also shown remarkable resilience and innovation when properly supported. The future of zoonotic disease prevention lies in grab integrated, cross-disciplinary approaches like One Health and strengthening global

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cooperation. Regional preparedness must not only be about rapid response but also long-term investment in surveillance, education, and ecological stewardship. High-income countries have both the capacity and the responsibility to lead by example by supporting global efforts, promoting research collaboration and ensuring equitable access to resources and technologies. In an increasingly interconnected world, no region is immune and no strategy is complete without a global lens. The next zoonotic threat is not a matter of if, but when. The time to prepare is now and the time to collaborate is long overdue.