



Current Situation of Emerging Infectious Diseases and Their Global Significance

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Peer Review Information	Abstract
<i>Submission: 29 Jan 2025</i> <i>Revision: 04 March 2025</i> <i>Acceptance: 10 April 2025</i> Keywords <i>Emerging Infectious Diseases</i> <i>Global Health</i> <i>Infectious Disease Outbreaks</i> <i>Pandemic Preparedness</i>	Emerging infectious diseases (EIDs) are new infectious diseases surfacing in human populations or already endemic diseases quickly expanding in incidence or geography (World Health Organization [WHO], 2023). EIDs may emerge due to the emergence of a new pathogen as a result of evolution, transmission of local pathogens to a new geographic region, or growing resistance against conventional therapies. EIDs cannot be rivaled in their importance because they have the potential to destabilize public health infrastructure, impact economies, and break the chain of global preparedness. In this essay, EIDs are defined, the high-threat pathogens are named, and an examination of the global globalized world of global health and the threat posed by these diseases is made.

Understanding Emerging Infectious Diseases

EIDs can be emerging diseases or diseases that are increasingly on the rise in incidence because of etiological microbial, environmental, or human reasons. Others are, for example, the Ebola virus, which has hit numerous times in Africa, and drug-resistant tuberculosis, which is still taking a toll on health systems worldwide (Centers for Disease Control and Prevention [CDC], 2023).

Among some of the primary reasons that account for the alarming nature of EIDs is the potential for rapid spread across borders, an ideal example of which has been witnessed with SARS-CoV-2, the causative agent of COVID-19 (Hui et al., 2020). They can cause widespread morbidity and mortality with an unimaginable healthcare burden. It only required the COVID-19 pandemic itself to actually infect and kill millions of us and shatter economies globally, taking with it the vital need for forward

disease surveillance as well as global cooperation (WHO, 2023).

High-Threat Pathogens And Their Impact On Global Health

A few of the pathogens are hazardous as they can be easily transmitted from human to human, are fatal, or drug-resistant. Some of the most dreaded infectious diseases are as follows:

1. SARS-CoV-2 (COVID-19): SARS-CoV-2 emerged in the latter part of 2019 and triggered a global pandemic that took over 6 million lives worldwide (Johns Hopkins University, 2023). The pandemic revealed vulnerabilities in pandemic readiness that varied from disabling healthcare infrastructure to global supply chain disruption. Its infection rate, ability to evolve new strains, and impact on healthcare infrastructure made it a requirement for increased pandemic control initiatives and

- vaccine development activities (Hui et al., 2020).
2. Ebola Virus: Deadliest of viruses, Ebola kills more than 50% of its victims well-positioned to seize epidemics in command. The 2014-2016 West African epidemic and subsequent epidemics that have paralyzed the Democratic Republic of the Congo remind us that early intervention measures (WHO, 2023) must be put in place. Spread of the virus is brought about primarily by contact with body fluids, it thus requires strict infection control (WHO, 2023). Vaccine manufacturing, such as rVSV-ZEBOV, has vowed to stem future epidemics but at the expense of its affordability for bulk production and quick dissemination (Gostin et al., 2022).
3. Zika Virus: Zika virus is transmitted by Aedes mosquitoes, which was a global concern since it was linked to congenital impairment, i.e., microcephaly in infants. The 2015-2016 outbreak hastened vector control and sensitization efforts (CDC, 2023). Infection by Zika virus among pregnant women led to extreme developmental abnormalities in the infant, and this prompted tremendous vaccine research development and research for mosquito vector control. Though quite a contained phenomenon in the rest of us, our contemporary public health challenge is one to be feared (Fidler, 2021).
4. Avian Influenza (H5N1 and H7N9): H5N1 and H7N9 avian influenza viruses have the ability to mutate and infect humans and cause a pandemic. Recent re-emergence of influenza viruses in previous pandemics reminds us of continuous vigilance and strain update of vaccines (Gao et al., 2021). HPAI viruses have the potential to cause high case fatality respiratory disease. This reassortment with viruses already endemic in man as a host has potential for enhanced surveillance in live animal markets and poultry farms and strong pandemic preparedness (Hui et al., 2020).
5. Drug-Resistant Tuberculosis (XDR-TB): Tuberculosis is one of the most severe public health issues in the world, and extensive drug-resistant TB transmission makes tuberculosis incurable. WHO (2022) estimates antimicrobial resistance to be the most severe global public health threat. XDR-TB bacteria are resistant to the best first-line and second-line drugs, and regimens are weaker, more toxic, and longer. New drugs, better diagnostics, and more intensive public health

interventions halted its spread (Gostin et al., 2022).

Challenges In The Current Global Health Landscape

The COVID-19 pandemic highlighted the need for robust public health infrastructure, global cooperation, and scientific ingenuity. The EID response still faces some challenges.

- Climate Change and Disease Spread: Climate change and environmental degradation are increasing disease geographical ranges such as the vector of dengue and malaria (Caminade et al., 2019).
- Urbanization and Deforestation: Each entry of people into previously uncontacted regions increases the chances of zoonotic spillover events—disease spill-overs from animals to human beings (Daszak et al., 2020).
- Deteriorated Health Infrastructure: Even though they possess extremely poor existing health infrastructure in the majority of the low- and middle-income countries, they do not have even any form of infrastructure in which disease surveillance and control of outbreaks would be efficiently accomplished. They should strengthen their health infrastructure so that control of outbreaks in the future would be easy in them (Gostin et al., 2022).
- Vaccines and Misinformation: Misinformation and logistics are the global immunization challenges for vaccine technology development (Fidler, 2021).

Conclusion

Emergent infectious diseases pose a challenge to global health. Control and their capacity to impact millions necessitate the diversion of funds towards disease surveillance, vaccine production, and construction of health centers. They demand international response and additional expenditure on public health care and research and development. The lessons of past pandemics can inform the world how it can best prepare to face the consequences of the next epidemic.

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