



A Monthly e Magazine
ISSN:2583-2212
May, 2023; 3(05), 857-859

Popular Article

Comprehensive Strategies for Managing Emerging Infectious Diseases: Moving Beyond Vaccines

Sanjana^{1*}, Tripti Pande² and Hilari Debbarma³

¹Ph.D. Scholar, Division of Biological Products, ICAR-Indian Veterinary Research Institute, Izatnagar, U.P., 243122.

²Ph.D. Scholar, Division of Biological Standardization, ICAR-Indian Veterinary Research Institute, Izatnagar, U.P., 243122.

³M.V.Sc. Scholar, Division of Biological Products, ICAR-Indian Veterinary Research Institute, Izatnagar, U.P., 243122.

<https://doi.org/10.5281/zenodo.7977059>

Abstract

Emerging infectious diseases significantly threaten global health, demanding comprehensive strategies for effective management and control. While vaccines play a crucial role in prevention, a holistic approach encompassing various interventions is essential. This article explores the importance of adopting a multifaceted approach that extends beyond vaccines in managing emerging infectious diseases. It highlights the significance of early detection, robust surveillance systems, non-pharmaceutical interventions, public health infrastructure, and global cooperation to achieve comprehensive and sustainable management of these diseases.

Introduction

Emerging infectious diseases like SARS-CoV-2, Ebola, and Zika continue challenging global health systems. While vaccines have been instrumental in controlling several diseases, a broader approach is necessary to address the complexity and dynamic nature of emerging pathogens. This article examines the components of a holistic approach to managing emerging infectious diseases and the importance of integrating multiple interventions.

Early Detection and Surveillance Systems

Early detection is crucial in containing emerging infectious diseases. Strengthening surveillance systems, both at local and global levels plays a pivotal role in identifying and responding to outbreaks swiftly. Enhanced laboratory capacity, real-time data sharing, and rapid diagnostic techniques enable timely intervention and facilitate targeted containment measures.

Different tool and methodologies are available for surveillance that can aid in early disease diagnosis are available. Spatial epidemiology in which environmental factors for agent survival are analyzed. Regression



modelling can be done to predict disease occurrence based on different variable. Digital surveillance can be done using outbreak reports and other health information from government platforms. Environment modelling and expert opinion are other such methods.

Non-Pharmaceutical Interventions

Non-pharmaceutical interventions (NPIs) complement vaccines in controlling the spread of emerging infectious diseases. These interventions include physical distancing, mask-wearing, hand hygiene, and environmental sanitation. Implementing NPIs in a timely and coordinated manner can significantly reduce transmission rates, especially in the absence of specific vaccines or during vaccine development stages. In order to control spread of influenza like respiratory disease in case of high risk of transmission barriers like masks, gowns, gloves and isolation are found effective and cheaper.

Public Health Infrastructure and Preparedness

A robust and resilient public health infrastructure is vital for managing emerging infectious diseases. Investments in healthcare systems, including a sufficient healthcare workforce, well-equipped laboratories, efficient surveillance networks, and accessible healthcare services, are essential for early response, efficient case management, and effective communication with the public. In preparedness eleven elements are considered- governance and leadership, workforce capacity, planning process, resources, practice and experience, risk analysis, community engagement, communication and learning and evaluation.

One Health Approach

The One Health approach recognizes the interconnectedness of human, animal, and environmental health. Collaboration between human health, animal health, and environmental sectors is crucial, considering the zoonotic origin of many emerging infectious diseases. This approach promotes joint surveillance, research, and coordinated response efforts to prevent and control emerging diseases at their source.

Global Cooperation and Collaboration

Emerging infectious diseases transcend national boundaries, necessitating global cooperation and collaboration. Sharing information, resources, and expertise among nations enables a coordinated response to outbreaks. International organizations, such as the World Health Organization (WHO), play a vital role in facilitating collaboration, harmonizing guidelines, and mobilizing resources for effective pandemic management.

Research and Innovation

Continued investment in research and innovation is essential for advancing our understanding of emerging infectious diseases. This includes the development of novel diagnostics, antiviral treatments, and therapeutics. Moreover, research should focus on the ecology of emerging pathogens, host-pathogen



interactions, and surveillance methodologies to inform proactive prevention and control strategies.

Community Engagement and Risk Communication

Engaging communities in risk communication and fostering public trust is crucial for successful pandemic management. Clear, transparent, and culturally sensitive communication can help mitigate misinformation, address vaccine hesitancy, and promote adherence to preventive measures.

Conclusion

A comprehensive strategy for managing emerging infectious diseases goes beyond relying solely on vaccines. It is imperative to adopt a holistic approach that encompasses various vital elements. Early detection of outbreaks, bolstering surveillance systems, implementing non-pharmaceutical interventions, developing resilient public health infrastructure, fostering collaboration through the One Health approach, promoting global cooperation, investing in research and innovation, and ensuring effective risk communication are all vital components of this approach. By embracing this multifaceted strategy, we can strengthen our preparedness and response to emerging infectious diseases, effectively safeguarding public health and minimizing the impact of future outbreaks.

References

- Afrough, B., Dowall, S., & Hewson, R. (2019). Emerging viruses and current strategies for vaccine intervention. *Clinical and experimental immunology*, 196(2), 157–166.
- Bloom, D. E., Brenzel, L., Cadarette, D., & Sullivan, J. (2017). Moving beyond traditional valuation of vaccination: Needs and opportunities. *Vaccine*, 35 Suppl 1, A29–A35.
- Lee, J. M., Jansen, R., Sanderson, K. E., Guerra, F., Keller-Olaman, S., Murti, M., ... & Khan, Y. (2023). Public health emergency preparedness for infectious disease emergencies: a scoping review of recent evidence. *BMC Public Health*, 23(1), 420.
- Rodríguez-Prieto, V., Vicente-Rubiano, M., Sánchez-Matamoros, A., Rubio-Guerri, C., Melero, M., Martínez-López, B., ..., & Sánchez-Vizcaíno, J. M. (2015). Systematic review of surveillance systems and methods for early detection of exotic, new and re-emerging diseases in animal populations. *Epidemiology & Infection*, 143(10), 2018-2042.
- Trovato, M., Sartorius, R., D'Apice, L., Manco, R., & De Berardinis, P. (2020). Viral emerging diseases: challenges in developing vaccination strategies. *Frontiers in Immunology*, 11, 2130.

