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Emerging and Re-emerging Diseases: Understanding the Impact of Vaccine Hesitancy and Environmental Changes

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Introduction

In recent years, the global health landscape has witnessed the emergence of new infectious diseases and the resurgence of previously controlled diseases. Factors such as vaccine hesitancy and environmental changes have played significant roles in these phenomena, posing challenges to public health systems worldwide. This article explores the dynamics of newly identified diseases like Ebola virus disease and Zika virus, alongside the resurgence of diseases such as measles and pertussis, examining the underlying factors, impacts, and strategies for prevention and control.

Description

Ebola virus disease is a severe and often fatal illness caused by the Ebola virus, characterized by fever, severe headache, muscle pain, weakness, vomiting, diarrhea, and in some cases, internal and external bleeding. The disease was first identified in 1976, with outbreaks occurring primarily in Central and West Africa. The 2014-2016 West Africa Ebola outbreak was the largest and most complex, highlighting the devastating impact of the disease on affected communities and the global health response. Zika virus is primarily transmitted through the bite of infected Aedes mosquitoes, with symptoms including fever, rash, joint pain, and conjunctivitis. While Zika virus outbreaks had occurred sporadically since its discovery in the 1950s, the 2015-2016 outbreak in the Americas raised global concern due to its association with congenital birth defects, particularly microcephaly in newborns born to infected mothers. Increased international travel and trade contribute to the rapid spread of infectious diseases across borders. Deforestation, urbanization, and climate change alter ecosystems, bringing humans into closer contact with disease-carrying vectors (e.g., mosquitoes) and wildlife reservoirs. Limited healthcare resources and infrastructure in affected regions can hinder early detection, surveillance, and response to disease outbreaks. Measles is a highly contagious viral disease characterized by fever, cough, runny nose, and a distinctive rash. Before the introduction of measles vaccines, measles caused millions of deaths worldwide annually. Despite the availability of a safe and effective vaccine, measles outbreaks have resurged in recent years, fueled by vaccine hesitancy and suboptimal vaccination coverage rates in some communities. Pertussis is a respiratory infection caused by the bacterium Bordetella pertussis, characterized by severe coughing fits followed by a "whooping" sound when inhaling. While pertussis vaccines have reduced the incidence of the disease, outbreaks still occur due to waning immunity in vaccinated individuals and vaccine hesitancy leading to incomplete vaccination schedules. Misinformation, mistrust of vaccines, and complacency contribute to vaccine hesitancy, leading to lower vaccination rates and reduced community immunity (herd immunity). Pockets of under-vaccinated or unvaccinated individuals create susceptible populations where diseases can spread rapidly during outbreaks. Disparities in vaccine access and coverage contribute to the persistence of vaccine-preventable diseases in certain regions, perpetuating transmission and outbreaks. Outbreaks of diseases like Ebola virus disease and Zika virus strain healthcare systems, requiring resources for case management, surveillance, and outbreak response. Disease outbreaks result in economic losses due to healthcare expenditures, productivity losses, and disruptions to travel and trade. Outbreaks can lead to fear, stigmatization, and social disruption within affected communities, impacting livelihoods and well-being.

Conclusion

In conclusion, understanding the dynamics of newly identified and resurging diseases requires a multifaceted approach that addresses biological, environmental, social, and behavioral factors. By prioritizing prevention, vaccination, and strengthening healthcare systems, we can mitigate the impact of these diseases on public health and work towards a healthier, more resilient global community.

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