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Commentary

Herd Immunity Equity and Access in Global Health

Hiroshi Tanaka*

Department of Epidemiology and Biostatistics, Makerere University School of Public Health, Kampala, Uganda

ABOVE THE STUDY

Herd immunity is a concept that has long been central to public health strategies. It refers to the indirect protection from infectious diseases that occurs when a significant portion of a population becomes immune, either through vaccination or previous infection. The principle is straightforward when enough people are immune, the spread of the disease is slowed or halted, protecting those who are vulnerable and cannot develop immunity themselves. While the idea is elegant in theory, its application in real world scenarios is complex, influenced by social behavior, pathogen characteristics and public policy. Herd immunity has been most successfully achieved through vaccination campaigns. Diseases such as smallpox and polio were dramatically reduced and in the case of smallpox, eradicated thanks to coordinated immunization efforts. The threshold for herd immunity varies depending on how contagious a disease is. For instance, measles, which is highly infectious, requires around 95 percent of the population to be immune to stop its spread, while less contagious diseases may require a lower threshold. Despite its successes, the concept of herd immunity is often misunderstood, especially when it comes to emerging diseases. Achieving herd immunity through natural infection alone, without vaccination, carries serious risks. Infecting a large portion of the population exposes many to severe illness, long term complications or death. The COVID 19 pandemic highlighted these dangers attempts to rely on natural infection would have overwhelmed healthcare systems and resulted in unacceptably high mortality. Vaccination, in contrast, provides a safer and controlled path toward population level immunity.

Herd immunity is not a static goal it is influenced by multiple factors, including pathogen evolution, waning immunity and population movement. Some viruses mutate rapidly, potentially reducing the effectiveness of prior immunity. Influenza is a classic example, requiring annual vaccination campaigns to maintain herd protection because the virus evolves each year. COVID 19 similarly demonstrated how variants can alter the landscape of immunity, sometimes reducing the protection conferred by previous infections or vaccines. Social behavior also plays a critical role in shaping herd immunity. Vaccine hesitancy, misinformation and unequal access can prevent populations from reaching the necessary threshold for indirect protection. Equity is another key dimension. Herd immunity is only meaningful when immunity is widespread across all segments of society. Vulnerable populations such as the elderly, immunocompromised, or those living in underserved areas rely on the immunity of others to remain protected. If disparities in vaccination or healthcare access persist, herd immunity may fail to shield the most at risk groups, even when overall population immunity appears sufficient. Global health efforts must therefore prioritize equitable distribution, both within countries and across borders, to ensure that no community is left unprotected.

Recent advances in immunology and vaccine technology offer hope for achieving herd immunity more effectively. mRNA vaccines, viral vector vaccines and other novel platforms allow rapid responses to emerging pathogens, enabling quicker population level protection. These tools make herd immunity a more achievable and sustainable goal, provided they are implemented thoughtfully and in conjunction with public health measures such as testing, masking and social distancing when necessary. However, it is important to recognize that herd immunity is not a cure all. It does not eliminate the need for ongoing vigilance, surveillance and healthcare infrastructure. Pathogens may persist at low levels and immunity can wane over time, requiring booster shots or new vaccine formulations. Public health strategies must remain adaptive, balancing vaccination programs with monitoring of pathogen evolution and changes in population immunity. Herd immunity should be viewed as part of a broader framework of disease prevention rather than a single endpoint. Herd immunity remains a powerful tool for controlling infectious diseases, but it is neither simple nor automatic.

Correspondence to: Hiroshi Tanaka, Department of Epidemiology and Biostatistics, Makerere University School of Public Health, Kampala, Uganda, Email: h.tanaka@gmail.com

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