IPCRG practice driven answers on COVID-19 and respiratory questions

What percentage of the population is needed to be immune to SARS-CoV-2 variants to achieve population level immunity?

What the research says

Population immunity (also referred to as 'herd' immunity) is the indirect protection for individuals with no pre-existing immunity that is achieved when a certain proportion of a population has immunity to an infectious disease. This can be either through natural infection or vaccination. Population immunity is calculated based on the whole population, including children as well as adults. It is used to define a threshold proportion of individuals with immunity that should result in a decline in the incidence of infection. At least in the short term, the target for population immunity against SARS-CoV-2 may be to minimize the risk for severe COVID-19 illness and minimize the societal impact of the virus and enable a return toward normal life. Achieving a level of population immunity against SARS-CoV-2 that minimizes community spread of the virus will also be important in reducing the opportunity for the emergence of new variants of the virus. The proportion of the population with immunity needed to achieve population-level immunity depends on how infectious the disease is. For example, measles is a highly infectious disease and requires 95% of the population to have immunity to protect those without immunity.

For this reason, the proportion of individuals with immunity required to achieve population immunity will likely be higher for the more infectious SARS-CoV-2 variants such as the Delta variant.

The precise proportion of individuals required to have immunity against SARS-CoV-2 to achieve population-level immunity is currently unknown. In addition to immunity achieved through natural infection, vaccination rates in excess of 70% of the total population to achieve population-level immunity have been proposed (Raina MacIntyre et al 2021). This figure may also vary depending on the population, e.g. may be higher for a population with a high proportion of individuals at risk of severe disease or with compromised immune systems (e.g. due to poor nutrition).

The World Health Organization advocates use of vaccination against SARS-CoV-2 to achieve global population immunity (WHO 2021).

What this means for your clinical practice

- Vaccination against SARS-CoV-2 is essential to protect individuals from severe COVID-19 illness, to reduce the opportunity for mutations to arise, including those that may increase the transmissibility or pathogenicity, and to achieve population immunity
- Continue to advocate and encourage uptake of vaccination against SARS-CoV-2 vaccination for all eligible individuals according to National guidance

Useful links and supporting references

Raina MacIntyre C, et al. Modelling of COVID-19 vaccination strategies and herd immunity, in scenarios of limited and full vaccine supply in NSW, Australia. Vaccine 2021:In Press. Available at: https://www.sciencedirect.com/science/article/pii/S0264410X21005016?via%3Dihub. Accessed September 2021.

WHO. What is WHO's position on 'herd immunity' as a way of fighting COVID-19? Available at: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/coronavirus-disease-answers?query=herd+immunity&referrerPageUrl=https%3A%2F%2Fwww.who.int%2Femergencies%2Fdiseases%2Fnovel-coronavirus-2019%2Fcoronavirus-disease-answers. Accessed September 2021.

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