

Achieving and sustaining herd immunity to SARS-CoV-2

Shelly Bolotin MSc PhD, Sarah Wilson MSc MD, Michelle Murti MPH MD

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1 Herd immunity provides indirect protection to people who are susceptible to an infectious disease

The herd immunity threshold is the minimum proportion of the population that must be immune to an infectious disease, usually due to vaccination, for the incidence of the disease to remain stable or decrease.¹

2 The herd immunity threshold correlates with the infectiousness of the pathogen

The herd immunity threshold for measles, one of the most infectious diseases, is about 94%.¹ For SARS-CoV-2 variants of concern, such as B.1.1.7 (Alpha), the threshold is about 80%² and it may be higher for newly emerging variants like B.1.617.2 (Delta).³

3 Effective vaccines with lasting protection are essential for achieving herd immunity

Vaccines are not perfect, and some vaccinated people can still become infected and transmit SARS-CoV-2.⁴ People who are immunosuppressed may not mount an adequate immune response. Outbreaks may occur despite high vaccine coverage in the population. Effectiveness varies by type of vaccine, number of doses administered and the particular SARS-CoV-2 variant in circulation. Based on estimates of the effectiveness of 2 vaccine doses against symptomatic infection with B.1.1.7 (Alpha) in Ontario (90% effectiveness), nearly 90% vaccine coverage in the population may be required for herd immunity.⁵ Increases in the prevalence of more infectious variants, and reduced vaccine effectiveness against them, would require even higher coverage. The duration of immunity from infection or vaccination is currently unknown.⁴

4 Vaccine hesitancy and structural barriers to vaccination may threaten herd immunity

High and even vaccine coverage is needed to achieve herd immunity. Achieving sufficient vaccine coverage depends on addressing vaccine hesitancy and barriers to vaccination that may result in pockets of susceptibility.

5 Maintaining herd immunity requires sustained effort

Maintaining herd immunity will depend on vaccines being effective against variants, addressing barriers to vaccination, and sustaining coverage if repeat vaccination is required and as the population changes (e.g., due to births, immigration). Even if herd immunity is not achieved, high vaccine coverage will substantially reduce rates of morbidity and mortality, and lessen the burden of COVID-19 on Canada's health care systems.

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Affiliations: Public Health Ontario, and Dalla Lana School of Public Health, University of Toronto, Toronto, Ont.

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Correspondence to: Shelly Bolotin, shelly.bolotin@oahpp.ca