

ABSTRACT & COMMENTARY

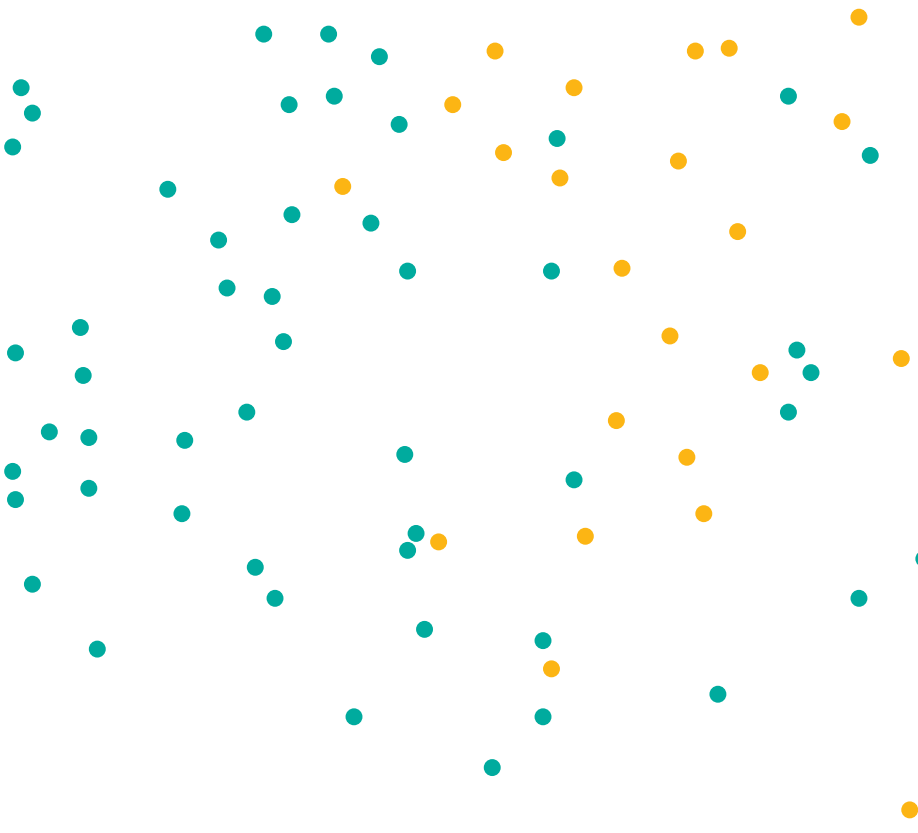
Quantifying the Risk of SARS-CoV-2 Transmission in the United States

Stan Deresinski, MD, Clinical Professor of Medicine, Stanford University

Synopsis—In the United States, the rate of symptomatic transmission of SARS-CoV-2 to contacts was only 0.45%, but was 10.5% in household contacts; there were tertiary symptomatic transmissions. However, since only symptomatic individuals underwent testing, the actual overall rate of transmission with or without resultant symptomatic illness is likely to be higher.

On Jan. 20, 2020, state and local health departments in the United States, together with Centers for Disease Control and Prevention (CDC) teams, began identifying and monitoring all close contacts of patients with confirmed COVID-19.¹ By Feb. 26, 12 travel-related cases and three with no travel history (two of whom were close household contacts of cases) had been diagnosed. These were in addition to 46 cases in repatriated U.S. citizens.

Examination of the first 10 travel-related cases led to the identification of 445 close contacts, with a range of one to 201 per case. Nineteen of the 445 lived in the same household as the case, and five of these continued to have exposure to a case who had been isolated at home. In addition, 104 (23%) were community members who had spent ≥ 10 minutes

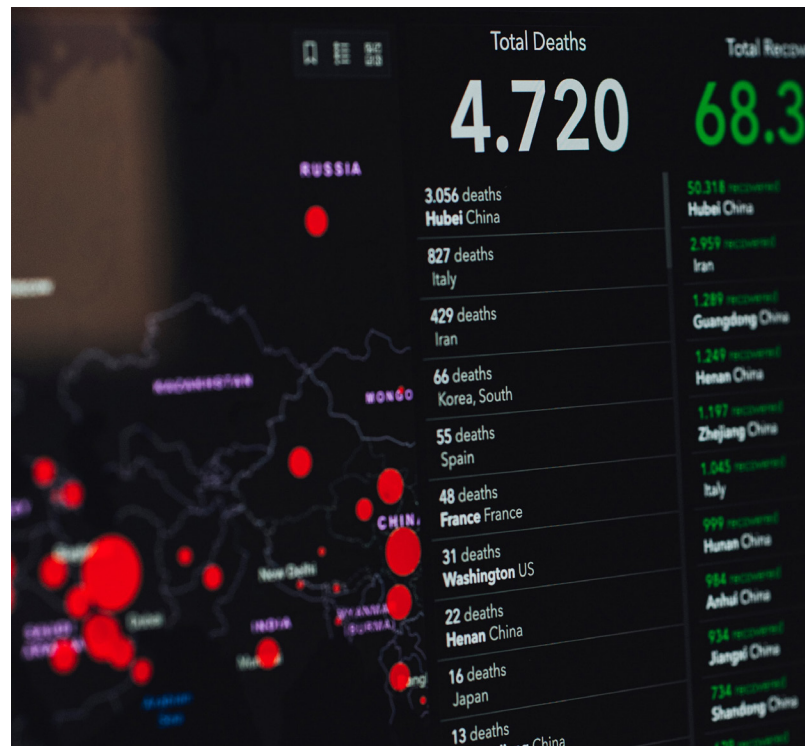


within 6 feet of a case patient, while 100 (22%) were community members exposed to a patient in a healthcare setting, and 222 (50%) were healthcare personnel.

Contacts were actively monitored for new or worsening symptoms for 14 days. During that time, 54 (12%) met criteria and became persons under investigation (PUI) and were tested for evidence of COVID-19. These people were tested, and two (both household contacts) of the 54 proved to be infected, for a calculated symptomatic attack rate of only 0.45%. However, among household members, this rate was 10.5%. Of interest is that both household secondary cases were not among those with continued contact with a case patient after the latter's diagnosis.

To determine the risk of transmission from the two secondary cases (tertiary transmission), 146 of their contacts were monitored for 14 days. While 18 (12%) developed symptoms, none were infected.

Photo by Markus Spiske, via Unsplash



COMMENTARY

In this epidemiological study, the secondary attack rate among symptomatic contacts was only 0.45% overall, but was 10.5% among symptomatic household contacts. At the same time, the tertiary symptomatic attack rate was 0%, indicating an apparent lack of sustained serial transmission of infection. However, it must be emphasized that these results may underestimate the true rate of overall transmission, since only symptomatic contacts underwent testing and we know that COVID-19 infections may be asymptomatic.

Nonetheless, the fact that the rate of transmission causing symptomatic infection is approximately 20 times higher in household contacts than in general contacts is an indication that the risk is determined in large part by the intimacy and duration of contact. More work is to be done.