

Non-household transmission of SARS-CoV-2 underscores importance of stay-at-home orders

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- Ghinai I, et al. "Community Transmission of SARS-CoV-2 at Two Family Gatherings — Chicago, Illinois, February–March 2020." *MMWR Morb Mortal Wkly Rep.* 2020;69:446–450, <http://dx.doi.org/10.15585/mmwr.mm6915e1>.

Editor's note: For the latest news on coronavirus disease 2019, visit <https://www.aapublications.org/news/2020/01/28/coronavirus>.

The SARS-CoV-2 virus primarily is spread by respiratory droplets, and transmission among close household contacts was demonstrated early in the pandemic. However, public health officials quickly recognized that the virus was quite contagious even among non-household contacts, prompting national stay-at-home recommendations beginning in early March.

The majority of states subsequently implemented some form of stay-at-home order, resulting in many Americans practicing social distancing. Although it is difficult to appreciate the impact of such practices, social distancing undoubtedly prevented infections, hospitalizations and deaths from COVID-19.

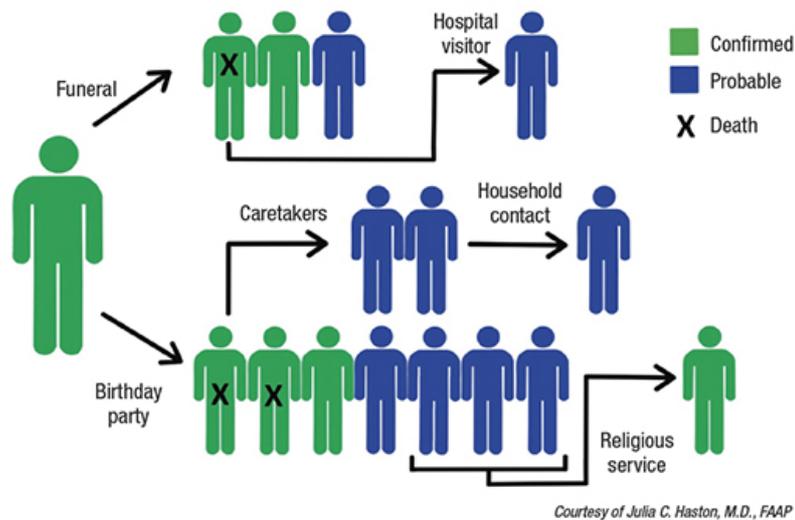
An investigation of a cluster of cases in Chicago prior to stay-at-home recommendations illustrated how rapidly this virus can spread and the danger presented by "super-spreading" events, where one individual spreads an infection to many others at a traceable event.

In February, when the disease was not yet widespread in Chicago, the Chicago Department of Public Health began an investigation of a cluster of COVID-19 cases that all resulted from a single source. The index case had recently traveled out of the state and was experiencing mild respiratory tract symptoms. The person shared two meals with family members of a recently deceased friend and attended the funeral while symptomatic. Within six days of the funeral, three members of the decedent's family had contracted illnesses consistent with COVID-19, two of whom were confirmed with SARS-CoV-2 testing. One of the three people died from the illness but not before infecting another individual (see figure).

Three days after the funeral, the index case attended a birthday party with nine other people. Of those, seven became ill with COVID-19-like illness, three of whom had laboratory-confirmed infection. Two of those with confirmed infection died. An additional four people were infected through caregiving practices, household contact and a church service.

In total, this cluster resulted in 16 infections (seven confirmed) among people ages 5 to 86 years and three deaths. All of those who died were over 60 years of age and had at least one underlying cardiovascular or respiratory medical condition.

Suspected transmission events in a cluster of COVID-19 cases in Chicago



All of these cases could have been prevented with appropriate social distancing practices. As the pandemic reached the United States and began affecting communities across the nation, the Centers for Disease Control and Prevention released guidance recommending individuals stay at least 6 feet away from other people, avoid gathering in groups and stay home as much as possible. These interventions were recommended in an attempt to slow the spread of disease in communities and protect those at highest risk of complications from the disease. However, the recommendations were not enforced in many cities and states until much later in the course of the pandemic.

Many may view birthday parties, funerals and religious services as “benign” forms of social gatherings, as these types of events often are attended by trusted family members or close friends. However, it is important to remember that SARS-CoV-2 may be carried and transmitted by anyone — even asymptomatic or mildly symptomatic family and friends.

The basic reproduction number (R_0) of SARS-CoV-2 has been estimated to be as high as 5.7, meaning that one infected person can be expected to spread the infection to 5.7 others, on average, in a population of susceptible individuals. This number is much higher than typically seen with more common respiratory tract infections, including seasonal influenza ($R_0 = 1.3$) and respiratory syncytial virus (RSV) ($R_0 = 3.0$). This means the virus is extremely contagious and has the potential to spread rapidly throughout communities, as has been demonstrated.

The cluster of cases described in Chicago highlights the importance of strict adherence to social distancing guidelines during an outbreak involving a highly contagious organism.

Since the virus emerged, much has been learned about SARS-CoV-2, which allows pediatricians to provide specific guidance to patients and their families about how they can protect themselves from COVID-19. Although respiratory transmission is most common and typically occurs between people who are within 6 feet of one another, studies have supported persistence of SARS-CoV-2 on surfaces and objects, thus

presenting the possibility of transmission through touching contaminated surfaces. As such, proper handwashing practices are essential in addition to wearing masks and avoiding contact with sick individuals.

Also, infected individuals who are asymptomatic are likely able to spread the disease to others. Therefore, masks should be worn at all times, especially in communities with ongoing high rates of transmission. In addition, everyone should follow social distancing recommendations, not just people with symptoms of illness.

As social distancing recommendations are lifted and businesses, schools, churches and workplaces reopen their doors, it will be important to remember lessons learned from super-spreading events. SARS-CoV-2 is very contagious and can spread by multiple modes of transmission. Pediatricians must continue to encourage patients and families to wash their hands frequently, stay home when ill and avoid contact with symptomatic people, including family members and friends.

Question

Which of the following viruses is the most contagious, as defined by the basic reproduction number?

- A. Influenza
- B. SARS-CoV-2
- C. RSV
- D. All of the above have similar basic reproduction numbers.

Answer: B. SARS-CoV-2

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