Events & Large Groups

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s the rate of COVID-19 disease increases in the community, large group meetings become increasingly risky, in part because there is a greater chance that these groups will include infected people. **Clusters of cases from large group events can rapidly increase the number of infections.** In addition, super-spreading events, characterized by one individual spreading the virus to many, are common with COVID-19 and can result in multiple infections.

When people infected with COVID-19 attend large groups, many people are exposed. Let's start with an example of 10 infected people and assume that each attends a single event. The number exposed will markedly increase as group size increases. If each one attends an event or goes to a location with 100 other people, then 1,000 people would be exposed and need to be quarantined. If each of the 10 infected people instead attended a gathering of under 10 then fewer than 100 would be exposed. The graphics on the following pages illustrate these concepts visually.

In short, large events with many people make it difficult to prevent a substantial increase in infections.

Events, Large Groups Increase Risk During the COVID-19 Pandemic

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In addition, the exposed people who become infected may go on to infect others if they are not quarantined in a timely way. With larger numbers initially exposed compared to smaller numbers, and with further exposures occurring, it becomes clear that one single large event can trigger substantial disease. Large events can markedly increase the number of new infections as well as numbers who need to be quarantined. Also, with large events, the ability to trace everyone may not be possible, leading to more people unknowingly infecting others.

In this memo we present hypothetical scenarios to illustrate the spread from large gatherings and highlight additional risk factors that can contribute to and prevent further transmission.

The Takeaway

When the daily count of COVID-19 cases in a community is high, the likelihood of including an infected person in any large group also becomes high. If 1 of every 100 people in a community is infected, and a group event looks like the community, then a group of 100 people is likely to include one infected person, who may then expose the other 99 people. But if that same

CONTINUED ON PAGE 3

Notes: Strategies for combating the spread of COVID-19 and their likely effectiveness, a review of models for forecasting the spread and severity of COVID-19, and other topics will be the subject of additional working papers. The views expressed are those of the advisory group and do not necessarily reflect the views of Vanderbilt University School of Medicine or Vanderbilt University Medical Center. Please see <u>vumc.org/health-policy/covid-19-advisory-memos</u> for those papers.

Why large groups are risky

Groups of people in close contact and contained spaces have been identified as a contributor to broader spread of COVID-19. Below is an illustration of how limiting group sizes can reduce or inhibit the spread of COVID-19.

1 group of 100

In groups of 25...

A group of 100 people with just 1 infected person can become a "super-spreader" event.



If the same people were reduced to **groups limited to 25**, the risk of spreading is also reduced. The **1 infected person** only exposes **24 other people**, while **75** remain safe.

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In groups of 10...

In groups of 10, the 1 infected person only exposes 9 people, while 90 remain safe.



Other risk factors

Crowded places

Where there are large numbers of people nearby.

Close-contact settings

Where people are close together, many of whom might be unmasked.



AVOID THE "3 C'S"

When more of these factors exist, the risk increases.



TIME MATTERS The more time that is spent in *any* of these settings increases the risk further.



Health Policy



Reduce or eliminate the time spent in risky settings.



Wear a mask.



Open windows or doors if possible to increase air flow.



Keep a safe (>6 ft.) distance from others.



How a Single Spark Starts a COVID-19 Fire

Let's assume a scenario where 1 infected person attends a gathering — a work meeting in an office — of 25 adults. That one person exposes 24 people, some of whom can and likely will become infected. A few days later, one of those people attends a dinner party with 9 others. Another adult, who later became infected after being exposed at the meeting, attended another event of 50 people, where another 49 people are exposed and 4 become infected. Of course not everyone will attend large events with a high risk of spread and not everyone who is exposed will get sick – but there is greater risk both in terms of the number of people who could be infected and the odds that any group will include one or more people who are infected. In this scenario, 1 infected person ultimately leads to exposure and guarantine of 85 others, 9 of whom become infected, in a 7-day period.



infected person instead attended a group event limited to only 10 people, then only 9 additional people would be exposed. In each of those groups, these single infected persons could in the coming week trigger markedly different numbers of subsequent infections simply because of the number of people initially exposed.

Thus, large groups can result in a rapid increase in cases that compromises the ability of the public health system to control spread of the virus and of the health

household members

attendees, 7 days later

care system to handle the number of sick patients. Risk is highest in groups in which people are crowded and close together, unmasked, in an indoor, confined space for prolonged periods of time. Group events can be made safer by avoiding crowding, wearing masks, improving ventilation, and limiting their duration. However, with high rates of disease in a community, large gatherings can contribute to rapid disease spread that communities are not equipped to control.