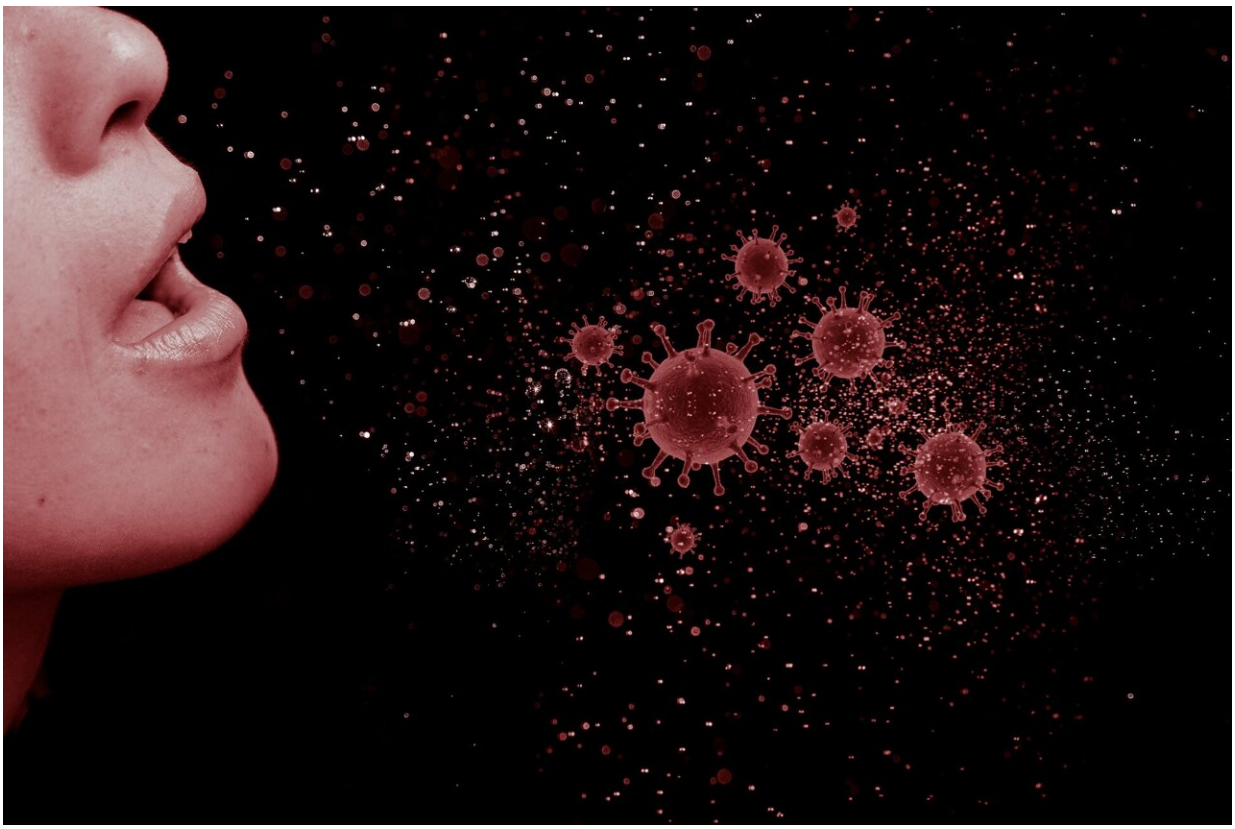
Modeling the potential role of super spreaders on COVID-19 transmission dynamics

April 19 2022, by David Bradley



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The term "superspreader event" has become well known since the emergence of the COVID-19 pandemic, although such events are not

without precedence throughout history. Such an event involves a large gathering of people wherein several individuals who are carriers of an infectious disease spread the disease to those with whom they come into contact at the event: Those newly infected individuals take away with them the potential to spread the disease to family, friends, work colleagues and many others.

Williams Chukwu of the Division of Infectious Diseases and Global Public Health at the University of California San Diego, U.S. and colleagues at the University of Zimbabwe and the University of Johannesburg, South Africa, explain that superspreader events can increase the public healthcare burden considerably in a short space of time. The researchers have now developed a mathematical model to look at the dynamics of the spread of COVID-19 at large events.

Their model takes into account two important variables that must be considered in assessing the risk and ultimate impact of large-scale events in the face of a major infectious disease: clinical, infectivity level and social or environmental contact level. Ultimately, it provides a way to assess the likely effect on wider public health of running large-scale events and what control measures might be put in place to reduce the risk of such an event being a superspreader.

Indeed, the measures the team suggests in the *International Journal of Mathematical Modelling and Numerical Optimisation* are those that have been implemented in many parts of the world with varying degrees of success in this pandemic and in previous pandemics—social distancing, curfews, wearing of face masks, use of hand sanitizers, and other measures. The team points out that the adoption and efficacy of vaccination programs should also be taken into account to reflect a more realistic model, where such programs have been instigated and events are being held.

More information: Josiah Mushanyu et al, Modelling the potential role of super spreaders on COVID-19 transmission dynamics, *International Journal of Mathematical Modelling and Numerical Optimisation* (2022). DOI: 10.1504/IJMMNO.2022.122123

Provided by Inderscience

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