UK 'close contact' definition for track and trace should curb COVID-19 spread but at a cost

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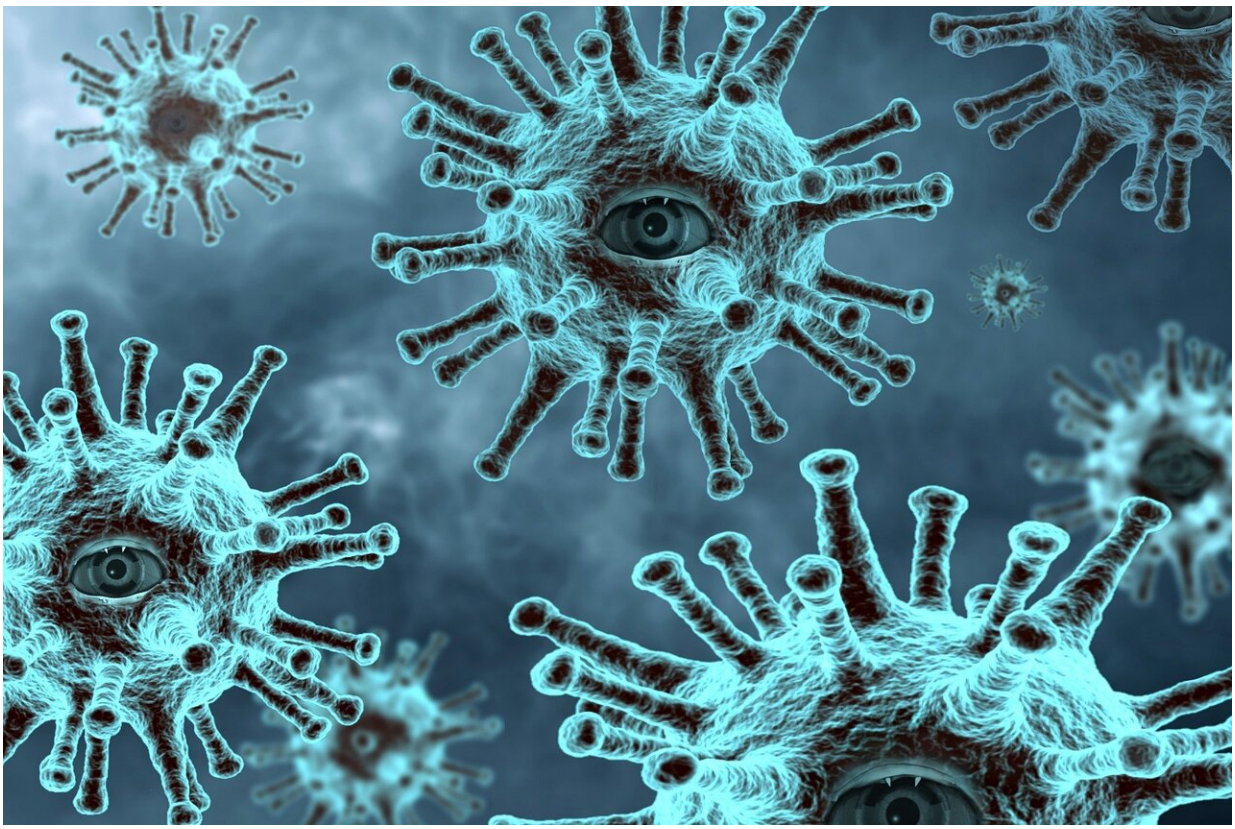

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15 or more minutes within 2 meters of distance—used for its coronavirus track and trace system, should curb the spread of COVID-19

infection, indicates research published online in the *Journal of Epidemiology & Community Health*.

But this will be at the cost of having to trace many uninfected people. And its ultimate success depends on the rapid detection and isolation of the contacts traced, say the researchers.

Although focused on containing the early stages of the COVID-19 outbreak in the UK, the study findings have clear implications for the current use of the test and trace system, they emphasize.

Contact tracing is especially effective in the early stages of an outbreak when treatment options are limited, say the researchers. It has been used before in the UK: 2009 flu pandemic; Ebola virus in 2014; and monkeypox in 2018. And it has long been used to stave off onward transmission of sexually transmitted infections.

Contact tracing is known to curb the spread of infections that are symptomless and take some time to be passed on. But it's not clear how effective it might be for new pathogens that spread quickly, such as SARS-CoV-2, the virus that causes COVID-19 infection.

To explore this further, the researchers drew on information supplied by respondents to a survey, asking them to state how many encounters they had had with others on a given day, as well as the context and duration of those encounters.

For the purposes of this study, the researchers defined an encounter with another person as a face to face conversation or skin on skin touch within a distance of 3 meters.

In all, 5802 respondents reported over 50,000 separate encounters, enabling the authors to conclude that over a period of 14 days the

average number of contacts was 217, although around 3% of respondents reported more than 1000 contacts during that time.

Of these, around one in four (27%; 59 contacts) met the UK definition of a close contact.

The researchers then used preliminary estimates of COVID-19 spread and the SEIR model, which captures the rate that people move from being Susceptible to infection, to Exposed to it, to Infectious, to Recovered, to predict the numbers of people in close contact with an infected person and traceable within two weeks.

They calculated that for every infected source person, an average of 36 (61%) close contacts could be identified and therefore traced, and that fewer than 1 in 6 infected people would generate any subsequent untraced infectious contacts.

But any one person is likely to have many encounters that are shorter than 15 minutes, such as when commuting or shopping, for example, and which would therefore fall outside the definition of a close contact. "Although unlikely to become infected [they] may pose a risk due to their greater abundance," warn the researchers.

And they predict that around 15% of infected cases would "generate at least one unidentified secondary case which would need detecting by other means" while 1 in 10 infected cases would generate "at least one person that couldn't even be identified.

"Similarly, we would expect around 3% of detected cases to not be able to identify their infecting individual," they write, but point out that these figures shouldn't be thought of as a failure of contact tracing; rather, a reflection of the uncertainties inherent in the approach.

Tightening the definition of a close contact to extend the time period could "dramatically lower" the number of contacts that would need to be traced, but would also increase the chances of infectious cases being missed, they explain.

A contact period of 4 or more hours would be unlikely to control an outbreak effectively, they suggest.

They acknowledge that their research has assumed that all primary infections start the process of contact tracing, which, given that many infected people don't have symptoms or seek medical care, is likely to be optimistic. And not all identified contacts will be traced sufficiently quickly to prevent further spread, they say.

But the current lower R number (reproductive ratio) and fewer contacts means that tracing doesn't have to be as effective to control the infection, they say.

And they conclude: "The current tracing strategy within the UK is likely to identify a sufficient proportion of infected individuals, such that subsequent spread could be prevented, although the ultimate success will depend on rapid detection of cases and isolation of contacts.

"Given the burden of tracing a large number of contacts to find new cases, there is the potential the system could be overwhelmed if imports of infection occur at a rapid rate," they warn.

More information: The efficacy of contact tracing for containment of the 2019 novel coronavirus (COVID-19), DOI: 10.1136/jech-2020-214051

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