Understanding the 'symptom-less' COVID-19 carriers key to stopping spread

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Lockdowns will not create enough herd immunity to control and eradicate COVID-19, but the measure is probably our best approach while we wait for a vaccine or faster and more thorough mass testing, according to physicists at the University of Aberdeen.

They estimate that in the specific outbreaks they modeled, only around eight percent of the population will have been exposed to the infection which they say will not lead to the levels of herd immunity required.

They say testing, including those showing no symptoms, is essential to combat the spread of COVID-19.

The paper by Dr. Francisco J. Pérez-Reche and Professor Norval Strachan has yet to be peer reviewed but can be downloaded from *medRxiv*—the preprint server for health services.

The researchers constructed a mathematical model based on tested and untested infectious individuals using data from the early stages of the outbreak in Germany, Italy, Spain, UK and the Hubei province in China.

The team found that the predicted percentage of untested individuals, who may be 'silent carriers' of the infection was 50-80% of the cases in these areas.

They found that Germany was likely to have the lowest percentage of unreported cases.

Combining their predictions with studies in Iceland and the Diamond Princess cruise, the researchers conclude that people who have the infection but display no symptoms are likely to be the main contribution to the 'untested cases' figure in all analysed outbreaks, however a fraction of cases with mild symptoms are also likely to be untested.

Even when unreported cases are taken into account, they estimate that less than eight percent of the population in the analysed outbreaks would have been exposed to the infection.

The researchers say such a low infection rate could mean that if and when restrictions are lifted, the virus could re-emerge.

They predict that in time, a partial relaxation of ongoing lockdowns could keep daily deaths from COVID-19 to less than 100 a day.

The team conclude that without thorough and extensive screening, carriers of the infection that display no symptoms—which are currently missed by most countries—will continue to spread COVID-19 widely. As such, they say, any isolation of infected individuals must take into account those who do not display symptoms.

Dr. Perez-Reche said: "In policy terms, our results demonstrate that the current suppression strategies being employed in Germany, Hubei, Italy, Spain and the UK will not facilitate sufficient levels of herd

immunity in the population that would control and eventually eradicate the virus. This leaves the risk of re-emergence of the virus once suppression strategies are lifted, similar to second waves of infection observed in 1918 influenza epidemics. We predict, however, that partial relaxation of ongoing lockdowns could keep the number of daily deaths to less than 100.

Professor Strachan added: "Unreported cases act as silent carriers and control strategies would need to account for them or be prone to the risk of re-emergence or ineffective suppression of spread. For instance, we predict that isolation of infected individuals can have a limited impact on the suppression of spread unless it includes silent carriers that are currently missed by most countries.

Dr. Perez-Reche continued: "In line with previous suggestions, we suggest that, thorough testing combined with contact tracing, isolation of infected individuals and social distancing can be more effective to suppress COVID-19 spread than severe lockdowns.

"At present, however, lockdowns are probably the most effective way to delay epidemics until more effective pharmaceutical or non-pharmaceutical interventions, i.e. fast and thorough testing, become feasible."

More information: Francisco Perez-Reche et al. Importance of untested infectious individuals for the suppression of COVID-19 epidemics, (2020). DOI: 10.1101/2020.04.13.20064022

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