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Caution needed in assessing how infectious is coronavirus: GlobalData

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One way to answer is to determine the R0

One of the most frequently asked questions during the novel 2019 coronavirus (2019-nCoV) outbreak, centered in Wuhan, China, is: 'how contagious is this new virus?'

One way to answer is to determine the R0 (pronounced "R nought"), or basic reproduction number, of the virus. While several academic papers were published in late January of 2020 attempting to model R0, interpreting it accurately is difficult.

Kasey Fu, Director of Epidemiology at GlobalData explains: "There are a lot of uncertainties attached to the current R0 estimates for 2019-nCoV. R0 also takes into account the duration of disease illness and number of contacts expected during the duration of illness. As we gather more information about the new virus over the next weeks and months, R0 estimates are certainly expected to change."

"R0 is a mathematical theory in infectious disease epidemiology that measures how communicable a disease is within a population. The basics are simple: the R0 value indicates how many people one infected person can go on to infect. When R0 is greater than 1, the outbreak is ongoing, and the number of cases will increase. When R0 is less than one, disease transmission has stopped and the disease is eliminated from the population. The R0 modeled by researchers for the 2019-nCoV acute respiratory disease ranges from 2–5.47", he added.

R0 shouldn't be considered in terms of 'good' or 'bad'; it informs only one aspect of an outbreak. R0 is calculated by taking into account the ratio between the number of infections and the number of contacts the initial infected person had. The first cases found during an outbreak tend to be the most severe cases, while many asymptomatic or mild cases go unnoticed.

Fu concludes: "R0 is also affected by disease prevention measures. The same disease can have very different R0 values depending on the environment and social constructs. For example, the R0 of the 2019-nCoV acute respiratory disease in the US is less than that in China, due to the strict isolation protocols of potential cases that drastically decreases the number of contacts for an infected individual."

R0 can increase drastically if more of the mild/asymptomatic cases are found. A disease could have a R0 of 100, but 99% of those cases could be mild/asymptomatic. Consequently, a disease could have a R0 of 5, but almost all cases are severe.

These two R0 disease profiles are drastically different, and each have their own challenges in stopping the transmission.