

At least 50% of COVID-19 infections come from people who aren't showing symptoms: study

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A new study out of the University of Chicago has found that during the initial wave of the COVID-19 outbreak in New York City, only 1 in 5 to 1 in 7 cases of the virus was symptomatic. The research team found that

non-symptomatic cases substantially contribute to community transmission, making up at least 50% of the driving force of SARS-CoV-2 infection. The results were published on Feb. 10 in the *Proceedings of the National Academy of Sciences*.

When the COVID-19 epidemic arrived in the U.S., the investigators noticed that it was very difficult to estimate what proportion of people infected with SARS-CoV-2 would go on to develop symptoms, partially due to the initial challenges with [testing capacity](#).

"Without testing capacity data, it's very difficult to estimate the difference between cases that were unreported due to a lack of testing and cases that were actually asymptomatic," said first author Rahul Subramanian, a Ph.D. student of epidemiology at UChicago. "We wanted to disentangle those two things, and since New York City was one of the first cities to report the daily [number](#) of tests completed, we were able to use those numbers to estimate how many COVID-19 cases were symptomatic."

While there are a number of existing models that use epidemiological data to estimate undetected case numbers and transmission rates, this is the first peer-reviewed model to incorporate data about daily testing capacity and changes in testing rates over time to provide a more accurate picture of what proportion of SARS-CoV-2 infections are symptomatic in a large U.S. city.

"Incorporating these data into the model showed that the proportion of individuals who are symptomatic for COVID-19 is somewhere between 13% and 18%," said senior author Mercedes Pascual, Ph.D., the Louis Block Professor of Ecology and Evolution at UChicago. "And regardless of uncertainty in all other parameters, we can tell that more than 50% of the transmission happening in the community is from people without symptoms — those who are asymptomatic and pre-symptomatic."

While this [data analysis](#) does not indicate how infectious asymptomatic individuals are, nor account for the new variants of the virus currently spreading in the U.S., the model provides additional support for the importance of following [public health guidelines](#) to reduce community transmission of the virus, whether individuals show symptoms.

"Even if asymptomatic people aren't transmitting the virus at high rates, they constitute something like 80% of all infections," said co-author Qixin He, now an assistant professor at Perdue University. "This proportion is quite surprising. It's crucial that everyone—including individuals who don't show symptoms—adhere to public health guidelines, such as mask wearing and social distancing, and that mass testing is made easily accessible to all."

The investigators say that these results also demonstrate that public health agencies need to make their testing protocols and numbers publicly available to allow these data to be incorporated into existing transmission models.

"Making this information available is as important as reporting the number of cases," said Pascual. "Otherwise, we have a discrepancy between the number and type of cases that are reported over time and the underlying [transmission](#) dynamics. These data are critical for epidemiological modeling."

More information: Rahul Subramanian et al, Quantifying asymptomatic infection and transmission of COVID-19 in New York City using observed cases, serology, and testing capacity, *PNAS* March 2, 2021 118 (9) e2019716118; doi.org/10.1073/pnas.2019716118

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