

COVID-19 screening of asymptomatic people could decrease infections, deaths

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New research suggests when the COVID-19 pandemic is slowing, low-cost, recurring screening of asymptomatic people—at an expense of approximately \$3 or less per test every two weeks—could decrease

COVID-19 infections and deaths and be cost-effective. When the pandemic is surging, screening can be cost-effective when done more often, even if tests costs are higher. The report—led by researchers at Massachusetts General Hospital (MGH) - was recently published in *Clinical Infectious Diseases*.

COVID-19 testing refers generally to testing of people with symptoms of the illness, while screening refers to testing of individuals who do not have symptoms of the infection. In the United States, restricted testing capacity early in the pandemic led states such as Massachusetts to test only severely symptomatic people and those with a known exposure to someone with COVID-19. However, making COVID-19 testing available to all people with symptoms suggestive of the illness, as well as expanding to screening programs for the entire population—including those who are without symptoms—could reduce hospitalizations and deaths, allowing for safe resumption of economic and social activity.

"Massachusetts experienced a major COVID-19 outbreak beginning in March 2020, and while the outbreak is now under reasonably good control, questions remain about how to optimally deploy COVID testing, both in our current situation and in other settings—and communities—where new infections continue to rise," says Anne Neilan, MD, MPH, investigator in the MGH Divisions of General Pediatrics and Infectious Diseases and the Medical Practice Evaluation Center, who led the study. "While some have argued testing must be highly sensitive to be of value, others suggest that sensitivity can be sacrificed if tests are rapid, low-cost, frequent and widely available."

The study used a dynamic transmission model developed by members of the research team (the "CEACOV model") to analyze the outcomes anticipated from several different strategies for COVID-19 testing and screening for the entire population of Massachusetts, using laboratory-based polymerase chain reaction (PCR) tests. The PCR test uses a

sample taken from the nose or mouth (usually a nasal swab or a saliva sample), which is then sent to a laboratory that tests for the virus causing COVID-19. The model-based analysis revealed that repeated screening of the entire population would lead to the most favorable clinical outcomes, preventing the greatest number of infections, hospitalizations, and, ultimately, deaths. This was true in a wide range of scenarios, ranging from decreasing to rapidly rising numbers of new cases per day. Such a screening strategy could also be cost-effective, depending on the cost of the test and the frequency of screening.

"Based on the prices that most laboratories are now charging for the PCR test, with our current levels of new COVID-19 cases in Massachusetts, the most cost-effective strategy remains testing only people with symptoms of COVID-19. Importantly, for Massachusetts as of now, this includes testing all people with symptoms, and not only people whose symptoms are severe," says study co-senior author Andrea Ciaranello, MD, MPH, investigator in the Division of Infectious Diseases at MGH. "However, in locations where cases are rising, regular screening of the entire population, while expensive, will actually be of very good value. This is true even at current testing costs around \$50 and will be truer if [test](#) costs can be brought down substantially. There are creative ways to bring tests costs down; for example, using emerging techniques such as less expensive reagents, pooling of specimens in the lab, or carefully allocating unused testing capacity across cities or regions."

"When the pandemic is slowing, if testing costs can come down to \$5 or less, repeat screening of people without COVID symptoms would decrease infections and deaths, and be cost-effective," adds Neilan. "Our data suggest that even now, expanding testing and screening capacity must remain a focus of national efforts." Because the study modeled the use of the laboratory-based PCR tests, the investigators did not evaluate the possible use of even less sensitive and less expensive tests, such as

rapid tests used on-site at healthcare facilities (like urgent care locations), schools, or places of employment. Several such tests have been brought to market but are not yet widely available for use in these settings.

Adds Ciaranello, "It is important to note that these strategies involve repeated screening. Screening a group of people just one time, while an interesting snapshot, is an approach that will miss many people who will become able to infect others in the future. Because of this, we also found that screening just once was a less efficient use of healthcare resources under most circumstance than strategies using repeat testing."

"There is also a price to not being able to rapidly deploy testing," says Nielan. "Early in the pandemic, we struggled to provide testing even for people with symptoms of COVID-19. If expanded PCR testing had been widely available in Massachusetts from April to May 2020, our model suggests that more than 100,000 infections and approximately 100 deaths would have been averted during that month alone."

"Expanding testing and [screening](#) capacity will require careful logistical planning, and also responsiveness to changes in the numbers of new infections that we are seeing. This needs to be a priority for policymakers seeking to utilize available resources in the most efficient way," says Ciaranello.

More information: Anne M Neilan et al, Clinical Impact, Costs, and Cost-Effectiveness of Expanded SARS-CoV-2 Testing in Massachusetts, *Clinical Infectious Diseases* (2020). [DOI: 10.1093/cid/ciaa1418](https://doi.org/10.1093/cid/ciaa1418)

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