

How we can contain Covid-19 without a vaccine

Opinion by William Haseltine

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(CNN) While the world is waiting for a safe and effective Covid-19 vaccine, there is a strategy that can potentially bring an end to the pandemic in the United States without the development of pharmaceutical drugs. The strategy, which is cost-effective and compatible with American values like personal freedom, could feasibly bring the epidemic to a halt within two to three months.

This strategy would revolve around the distribution of rapid, saliva-based tests that can be administered at home, so that those who are contagious can be quickly identified and isolated. This would also eliminate the need

for contact tracing, which has become a nearly impossible task given the number of those potentially exposed in the US today.

Advances in our technology, along with our knowledge of the coronavirus, enable this strategy. We now know, for example, that people with Covid-19 are at their most contagious shortly after infection (before symptoms even appear) and continue to be infectious **for about 10 days thereafter**.

During this time, millions, if not billions, of viral particles swarm the airways, escaping into the air whenever these infected individuals cough, sneeze, or even talk loudly. This short period is critical for testing and isolation. Miss that window and people will likely pass the contagion to others.

Polymerase chain reaction (PCR) tests, which detect viral genetic material, are currently our diagnostic of choice due to their ability to detect even trace amounts of the virus. The downside of PCR tests is that they are time-consuming, expensive, and difficult to produce and deploy at scale. Labs across the country have struggled to keep pace with the demand, and many patients have had to wait **more than 10 days for results**, which essentially invalidates the point of testing.

The development of rapid antigen tests that deliver results within 15 minutes could be a game-changer. These tests, which detect proteins that are unique to the virus, remain underutilized in the United States, although there are plans to ramp up antigens tests in the fall. While they are less sensitive than PCR tests, if administered frequently enough they **detect almost all people** who produce enough live virus to infect someone else.

Changes in how viral samples are collected would also make testing more accessible. Most tests require trained health professionals to take samples using nasopharyngeal swabs -- long swabs that can reach past the nostrils to the upper part of the throat -- before government-approved laboratories can analyze the results.

New research now shows that saliva is a more reliable source for testing. Companies are currently developing simple antigen tests that do not require complex machinery to deliver results, and a setup (akin to a home pregnancy test) that can process a swab of saliva and make it easier for millions of Americans to conduct their own tests. With these, adults would be able to test themselves and their children, while spot checks at schools and workplaces may detect those who are reluctant to test themselves at home.

Ultimately, free home tests for all Americans would be the goal. One computer simulation suggests that if Americans are tested every **one to three days**, transmission would be reduced by more than 80% -- enough to conceivably put a rapid end to the epidemic.

If we test the entire US population every three days, that would amount to about 100 million tests a day. At that scale, these self-administered tests should cost no more than 50 cents each. (This isn't completely unheard of. Abbott Laboratories, an American company, recently supplied Egypt with enough rapid **hepatitis C tests** to screen about 60 million people for 50 cents each.) The intensive phase of the program would only need to last about two to three months. Administering 100 million tests a day, at a cost of 50 cents each for 100 days would come out to a total direct cost of about \$5 billion -- a small price to pay considering the economic fallout of the pandemic could cost the US economy **\$8 trillion** through 2030, according to projections from the Congressional Budget Office.

Assisted isolation for people who test positive, along with their family members if appropriate, is the second arm of the strategy. The goal is to make it economically and physically possible for all those who test positive to remain in isolation for 10 days. Assisted isolation would require financial and social support to assure that food, medical supplies, and shelter are provided as necessary.

Currently, [about 40,000 Americans a day](#) are testing positive for SARS-CoV-2. Evidence suggests our current strategy of testing the worried and the ill identifies only a fraction of those who are actually infected and potentially contagious. For my proposed strategy to succeed, the US government must be prepared to support assisted isolation for almost all households infected, and fold in a cash incentive in the costs to replace lost income and encourage participation among those who might otherwise be hesitant to report that someone in the household was infected.

Let's take a [conservative estimate](#) and assume 100,000 new households would need assisted isolation a day for three months. If each household must be isolated for at least 10 days, and if costs for food, shelter, and income compensation come out to about \$500 per family per day, the cost of the three-month program would amount to another \$50 billion.

The total direct costs for this Covid containment strategy would come out to about \$55 billion -- far less than the many trillions of dollars of national debt and lost economic opportunity. In May, [Harvard](#) put together a similar proposal calling for the investment in public health offices, contact tracing personnel, increased testing capacity, quarantine facilities and income support for people to self-isolate, with a roughly similar cost of \$74 billion. Advances in our knowledge and technology mean that today we can

get it done faster and at a lower cost than what they initially imagined.

The home test-assisted isolation strategy will not end the epidemic, but it will bring it under control. New cases, when and if they arise, can then be contained locally. With this strategy, we would be able to get back to work and school safely, without fear of igniting a second or third wave of infection. This strategy would also give us the time we need to develop safe and effective vaccines and drugs to prevent new infections and save the lives of those few who do fall ill.