What percent of Santa Clara County, California has been infected by SARS-CoV-2, the virus that causes COVID-19?

In this updated version, more modest claims from the researchers put the estimated rate at between 1.3-4.7%, which seems in line with other studies, though there are still ongoing concerns about the methods.

Key takeaways

1. This updated version of the study makes more reasonable claims than the first, and their estimate of 1.3-4.7% seems in line with other studies that have come out. These findings should not be extrapolated to other parts of the country like New York.
2. There are still concerns about how participants were selected and the accuracy of the test used, and the researchers acknowledge this

uncertainty.

3. Figuring out what percentage of the population has had COVID-19 remains vitally important, and there are many ongoing studies both in California and across the world that will help answer this question.

Why is this question important?

The question is important for two reasons:

1. We don't really know how many people have been exposed to the coronavirus. Due to a shortage of tests, many people with symptoms or suspected cases of coronavirus have not been tested, so the number of positive coronavirus tests probably underestimates the number of people who have had the virus. This can help decision makers understand how many people have the virus, which helps them make decisions about controlling its spread.

2. How dangerous is coronavirus? This reason is related to the first. Since we don't know how many people are infected, we can't accurately calculate how common it is to suffer serious symptoms or die from the virus. This is really important for us to understand so that we can understand the risks of the virus and also try and prepare our hospitals for the number of people who might need medical help.

Getting more information about these areas would be helpful for public health experts, epidemiologists, hospitals, and political leaders to implement the correct actions to

control the pandemic.

Our take

The first version of the study had come under heavy criticism from other researchers based on the way they tested for antibodies and the statistical techniques they used to arrive at their final estimate, so let's take a look at the strengths and weaknesses of the updated version.

Strengths

This was an ambitious study that was among the first of its kind in the United States. It provides a template for future researchers to improve upon. In the updated version of the study, the researchers acknowledged more of the flaws and limitations to their findings. Their estimated percentage (1.3-4.7%) of the population that has had COVID-19 seems more in-line with their data and the results of other studies in LA, New York, and other locations.

Weaknesses

A full discussion of the study and its analysis could fill a book chapter. We discuss three main areas of concern below.

What did the study do?

SAMPLING

Targeted Facebook ads to recruit participants

OUR TAKE

⚠️ **Not representative of the overall population**

Participants found out about the study through targeted Facebook ads. However the demographics (sex, race, zip code) were not very representative of the county as a whole. For example, only 8% of participants were Hispanic while the county is actually 26% Hispanic. The other problem is that certain people in the community, like the elderly who don't have internet access or can't easily drive to a testing center, were less likely to participate. Even more worrisome is that the ad to sign up for the study was circulated by a relative of the supervising researcher to a parents group in a wealthy zip code which could have further skewed the data. [1]

TESTING

Tested for antibodies in 3330 people

While most coronavirus tests look for the virus in the nose or throat, in this study, participants drove to a drive-through collection site where they had blood drawn through a finger prick. The blood was analyzed for antibodies which are produced when the body fights off a viral infection. By looking for these antibodies in your blood, it can be determined if you had the virus or not, even if you never showed any symptoms.

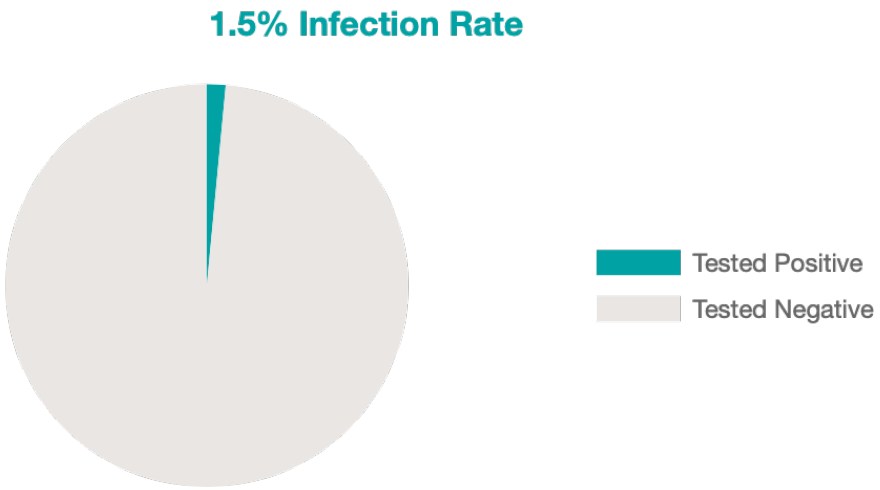
OUR TAKE

⚠️ **Antibody blood test may not be accurate enough**

No test is perfect, and every test will have some rate of false positives and false negatives. False positives are where the test says that a person has antibodies, but they actually do not. False negatives are where the test says the person doesn't have antibodies, but they actually do. In the updated study, the authors provide new data that shows the antibody test they used was even more accurate than they previously reported. This would go a long way to answering one of the concerns we expressed in our review of the first version. Still our concerns about the accuracy of the test remain, as much of the new data was provided by the manufacturer, and the test is currently unapproved and banned for export by the Chinese CDC. [2]

RESULTS

50 people tested positive



CONCLUSION

Estimated a 1.3 - 4.7% infection rate for Santa Clara county

The researchers used a number of statistical techniques to extrapolate their results to the population of the entire county. Based on this number, the authors made the claim that the actual number of infections in the county was much higher (26-95 times) than had been reported from standard testing. If true, that means COVID-19 is not as deadly as we thought, since a lot more people have it than we realized.

OUR TAKE

⚠️ **The death rate may be underreported**

Recently the Santa Clara Coroner's office revealed that there were two unrecognized deaths in early February due to coronavirus.[3] If there are other deaths that have been missed, this could significantly alter the death rate.

How was it reported?

VERY GOOD

- Feud Over Stanford Coronavirus Study: The Authors Owe Us All An Apology

SAN JOSE MERCURY NEWS

The article accurately covers the debate between the study authors' claims and the issues raised by researchers who are critical of the study.

OK

[Coronavirus Infections May Not Be Uncommon, Tests Suggest]

NEW YORK TIMES

The article reports on the paper's results, but does not mention any limitations of the study or the intense criticism it has faced.

NOT OK

[New Data Suggest the Coronavirus Isn't as Deadly as We Thought]

WALL STREET JOURNAL

⚠️ **Conflict of interest**

This opinion piece was actually written by one of the original researchers, which is a major conflict of interest. Unsurprisingly, there's no discussion of potential pitfalls in the study. There are definitely more balanced articles out there.

The original paper is a preprint study. It has *not* been certified by peer review from other researchers, and information presented may be erroneous. Do not use it to guide clinical practice! Learn more →

Original Paper

DOI: 10.1101/2020.04.14.20062463

COVID-19 Antibody Seroprevalence in Santa Clara County, California [PDF]

Additional Reading

For more details and technical discussion of the study, we recommend reading the following resources:

- Updated Santa Clara coronavirus report
- Bayesian analysis of Santa Clara Study
- How (Not) to Do an Antibody Survey for SARS-CoV-2
- Concerns with that Stanford study of coronavirus prevalence
- Peer Review of "COVID-19 Antibody Seroprevalence in Santa Clara County, California

Footnotes

1. Source: SF Chronicle
2. Source: Wired
3. Source: Santa Clara County

Revisions

The study authors revised their paper after posting it. We have explanations for the following revisions:

- **You are currently on Version 2**
- Version 1

Updates and Corrections

If you see a mistake or want to suggest changes, please contact us.

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What is Research Explained?