

BASICS OF COVID-19

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YEARS
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Infection and Immune Response

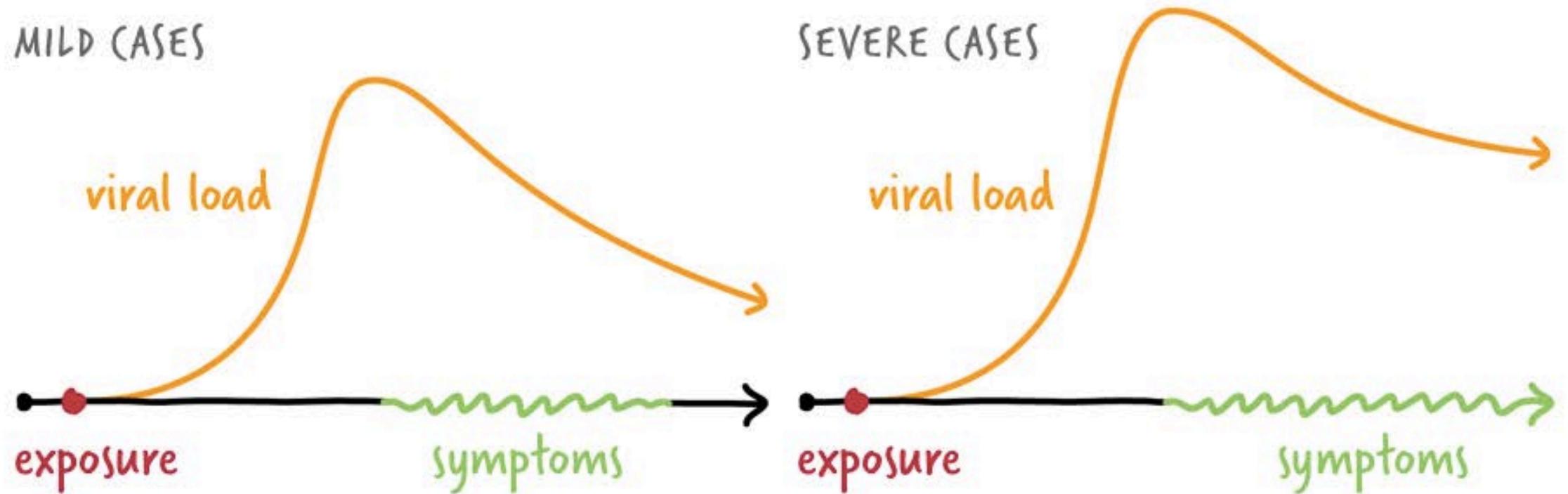
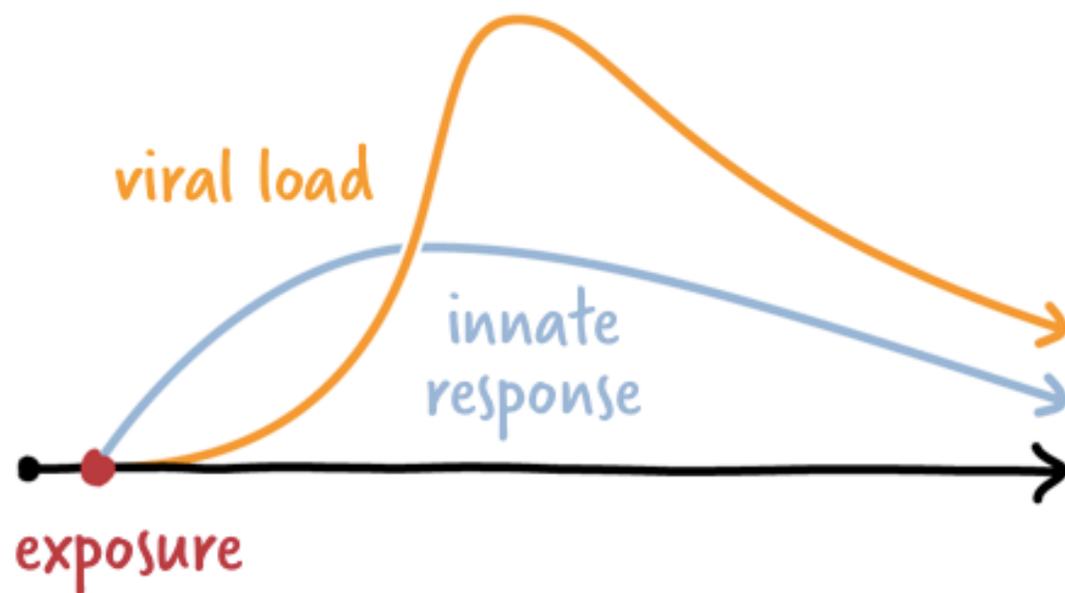


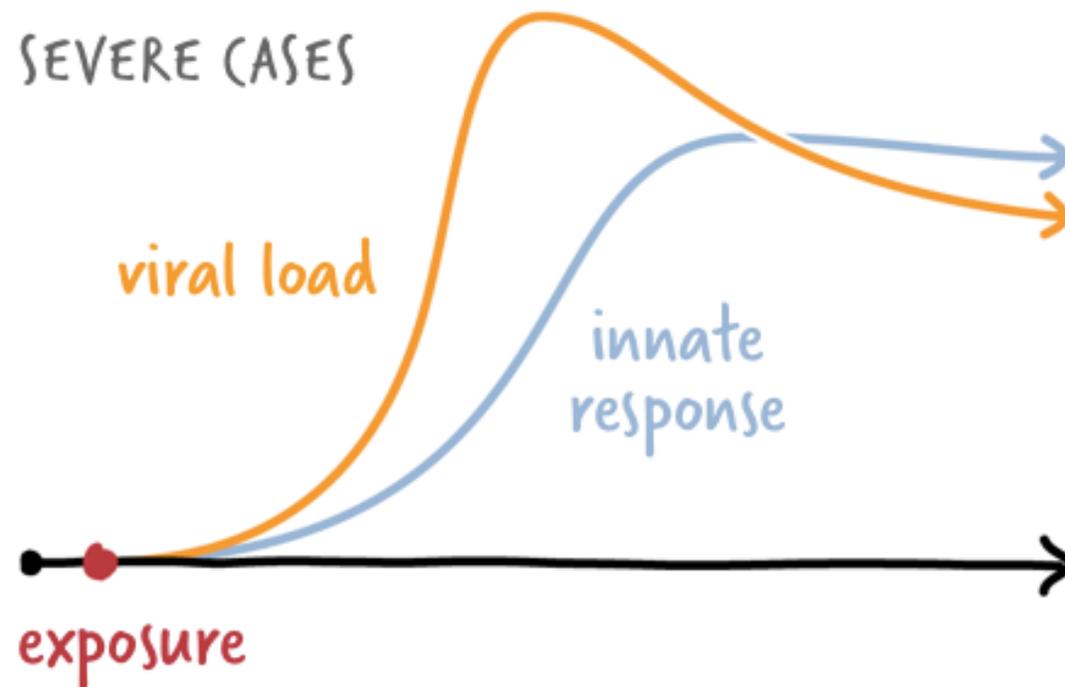
Image: NYTimes

Infection and Immune Response

MILD CASES



SEVERE CASES



Infection and Immune Response

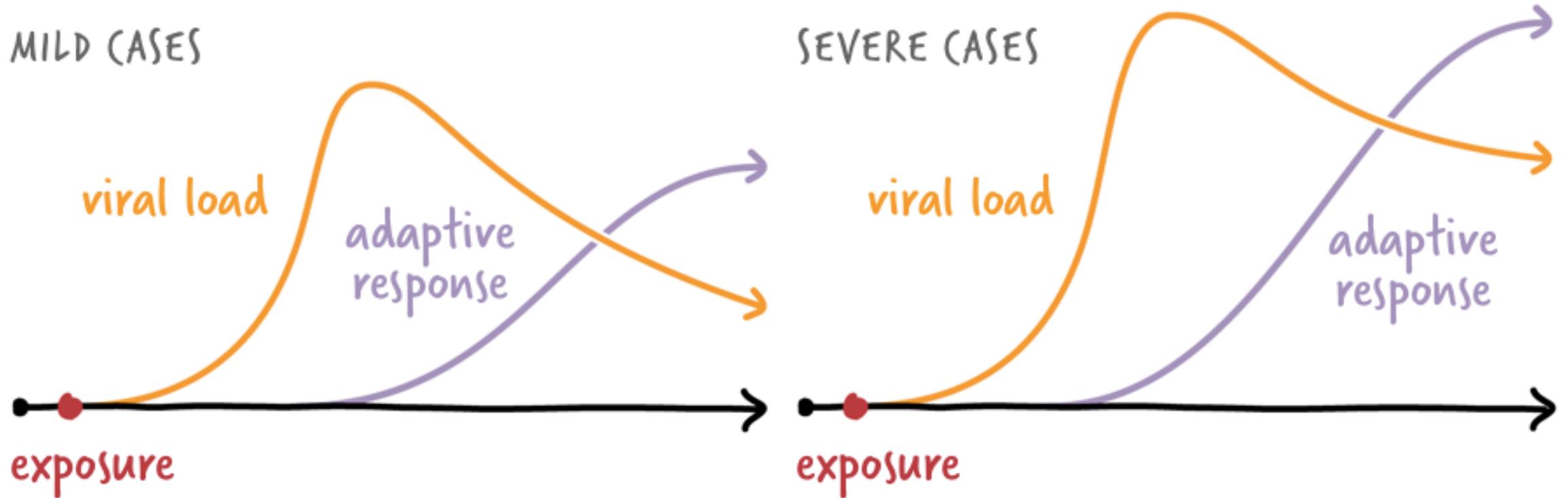
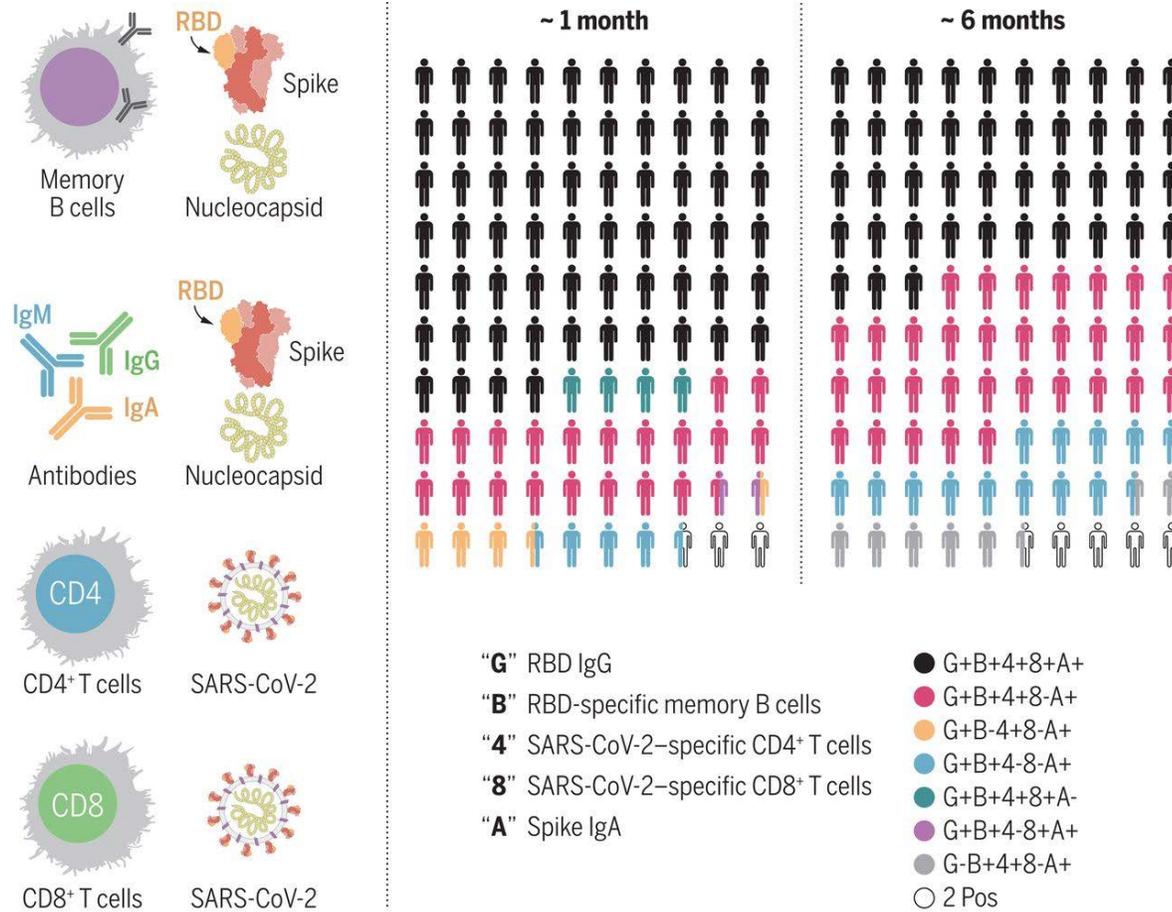


Image: NYTimes

Immune Response and Recovery



Robust immune memory was observed in most individuals.

What happens when people get infected with SARS-CoV-2?

The coronavirus affects people differently.



How do SARS-CoV-2 tests work?

HOW CURRENT TESTS WORK

- 1 A swab is taken of the inside of a patient's nose or the back of their throat. This sample is then sent to a lab to test.



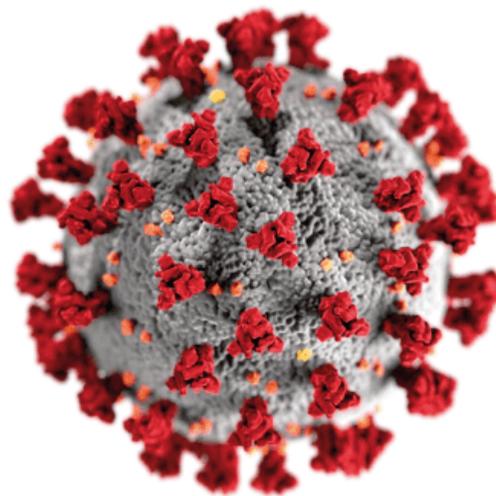
- 2 The RNA of the virus is extracted and purified. An enzyme, reverse transcriptase, converts the RNA to DNA.



- 3 The DNA is mixed with primers, sections of DNA designed to bind to characteristic parts of the virus DNA. Repeatedly heating then cooling DNA with these primers and a DNA-building enzyme makes millions of copies of virus DNA.

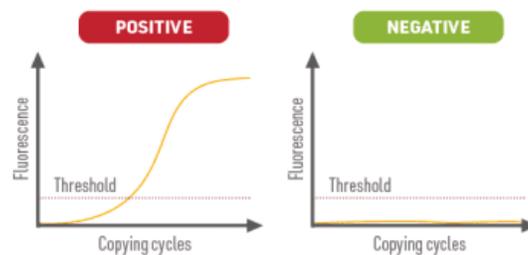


- 4 Fluorescent dye molecules bind to the virus DNA as it is copied. Binding makes them give off more light, which is used to confirm the presence of the virus in the sample.



POSITIVE AND NEGATIVE TESTS

The fluorescence increases as more copies of the virus DNA are produced. If it crosses a certain threshold, the test is positive. If the virus isn't present, no DNA copies are made and the threshold isn't reached. In this case, the test is negative.



ISSUES WITH TESTING



REAGENT ISSUES

High demand and issues with reagents have delayed testing in some countries.



TIME-CONSUMING

It takes a few hours to get results from the test, limiting how many tests can be done.

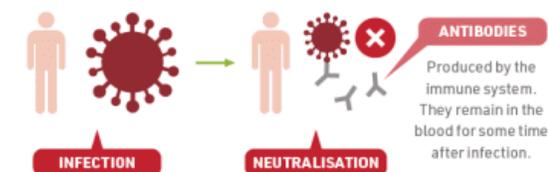


FALSE POSITIVES AND NEGATIVES

In some cases sample degradation or contamination can affect the results.

FUTURE TESTS

The current tests are good for diagnosing an infection – but they can't tell us if someone has had it and then recovered. Tests that look for antibodies against the virus can do this.



Tests that look for proteins on the surface of the virus are also in development. These tests are faster, but less accurate.

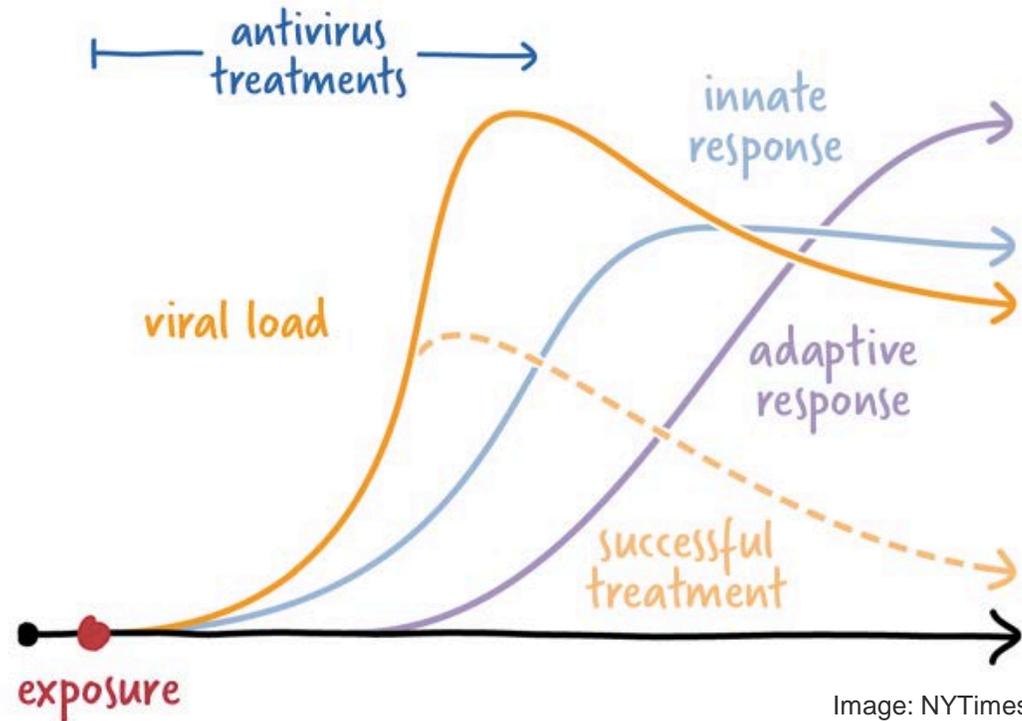


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Is there an FDA approved treatment drug?

Yes, the FDA has approved Veklury (remdesivir) for certain COVID-19 patients.



Are there other treatments?

Some drugs already FDA approved are being used off-label.

Example:

Dexamethasone (a steroid) has been shown to decrease mortality in hospitalized patients.

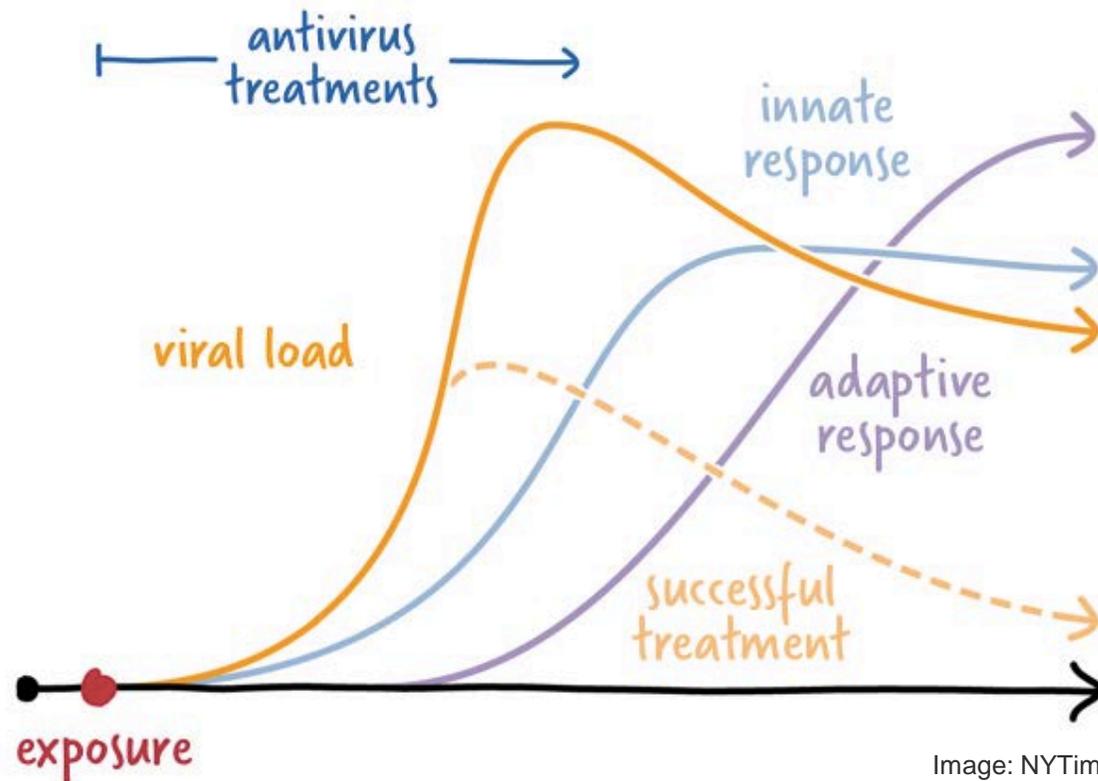


Image: NYTimes

Why do some people have long term consequences of infection?

Beyond factors such as age and sex, underlying aspects of biology and society influence disease severity.



Can you get the infection more than once?

Yes, but so far, it has been rare.

The role of new variants in re-infection is not clear.

Are there any common/uncommon side effects?

More likely



Less Likely

MODERNA

- Pain at injection site
- Fatigue
- Headache
- Muscle pain
- Joint pain
- Chills
- Swollen Lymph Nodes
- Facial Swelling
in people with facial fillers
- Bell's Palsy
- Allergic Reactions
- Anaphylaxis

PFIZER

- Injection site pain
- Fatigue
- Headaches
- Muscle soreness
- Chills
- Nausea
- Fevers
- Bell's Palsy
- Allergic Reactions
- Anaphylaxis

J&J

- Injection site pain
- Rash
- Headaches
- Muscle soreness
- Fevers



Note that Moderna and Pfizer have spent more time in the public. There is still a lot to learn about J&J.

Are there any common/uncommon side effects?

Patients Previously Infected with COVID-19

Early evidence suggests that this population may have more intense side effects.

Data is still being collected for other special populations, such as those who are pregnant, breastfeeding, or immunocompromised.

Should you get vaccinated if you have already had the disease?

Yes!

Early evidence suggests a strong immune response in this group.

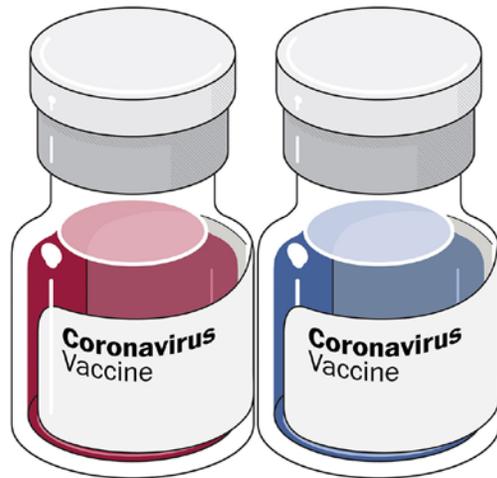
It is possible in the future that these individuals would receive 1 dose to minimize side effects without compromising protection against COVID-19.

Important Considerations:

Currently, must wait until 90 days after initial COVID-19 infection for vaccine sites
Timing of vaccination after infection does not actually matter

How long will vaccine protection last?

The exact duration that immunity lasts is still unknown.



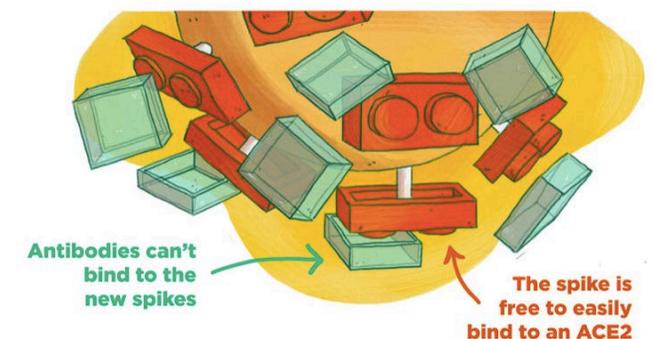
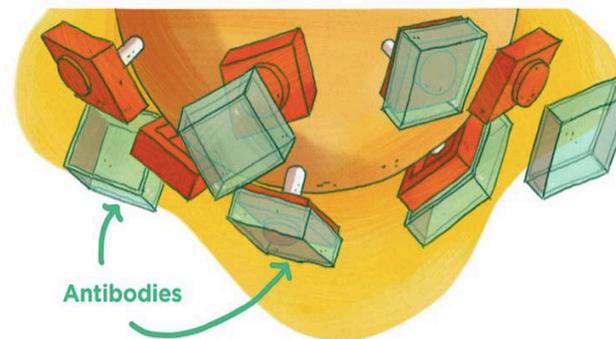
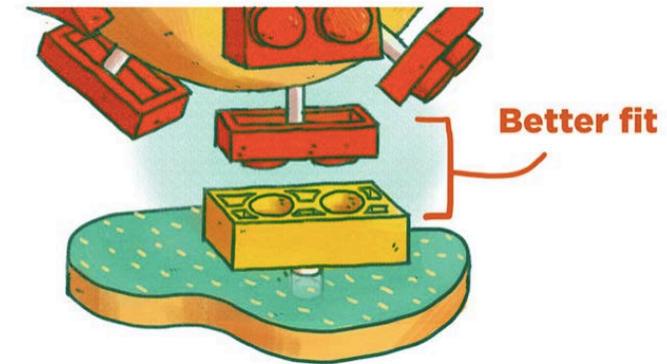
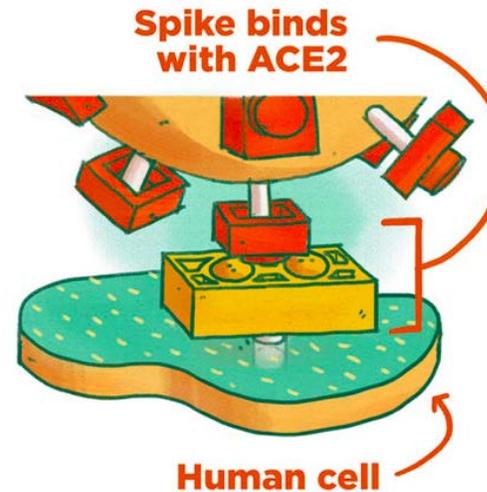
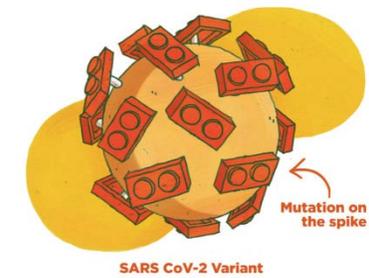
While more research needs to be done, experts believe you may have to receive the COVID-19 vaccine multiple times throughout your life rather than just once.

Will the vaccines work against new variants?

Scientists are actively trying to answer this question.

There may be...

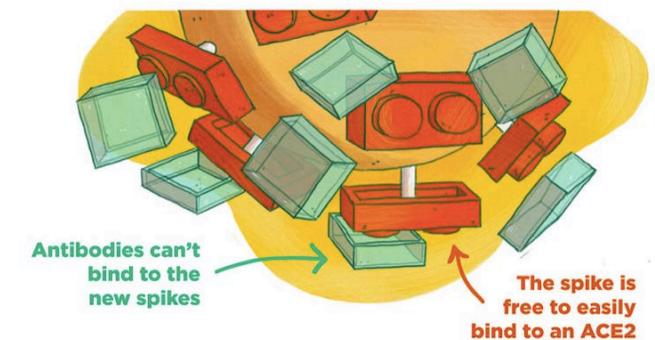
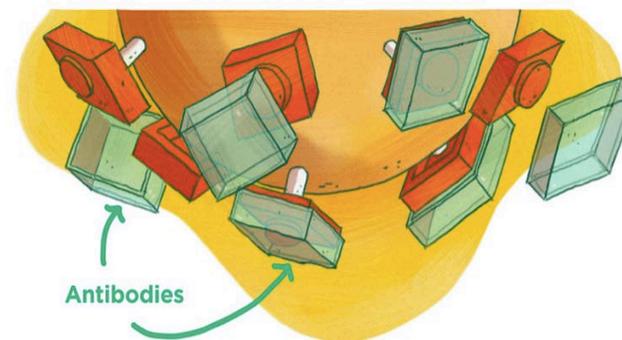
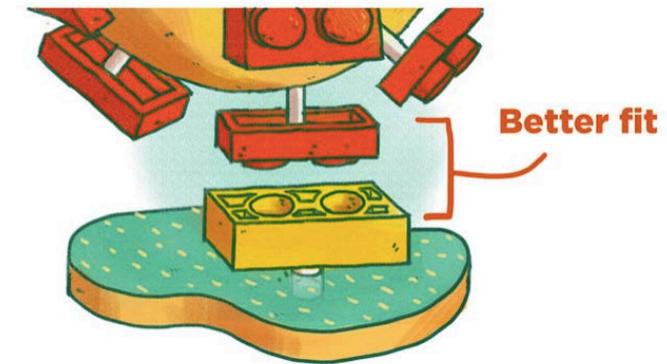
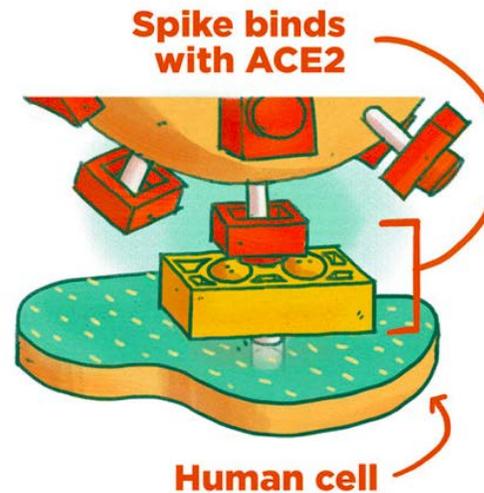
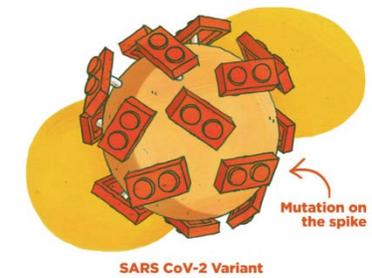
- differences in effectiveness
- a need to update vaccines



Will the vaccines work against new variants?

There's reason for optimism.

Even when less effective there's evidence that the vaccines still dramatically lower the chance of severe illness or death.



Can you get one shot of one vaccine, and a second shot of a different vaccine?

Yes, but ideally, you don't.

Safety and efficacy of mixing products have not been evaluated.

Every effort should be made to stick with the same vaccine.

Do people still need to wear masks and practice social distancing after they get vaccinated?

Yes!



The new vaccines will probably prevent you from getting sick with COVID-19.

No one knows yet whether they will keep you from spreading the virus to others — but that information is coming.

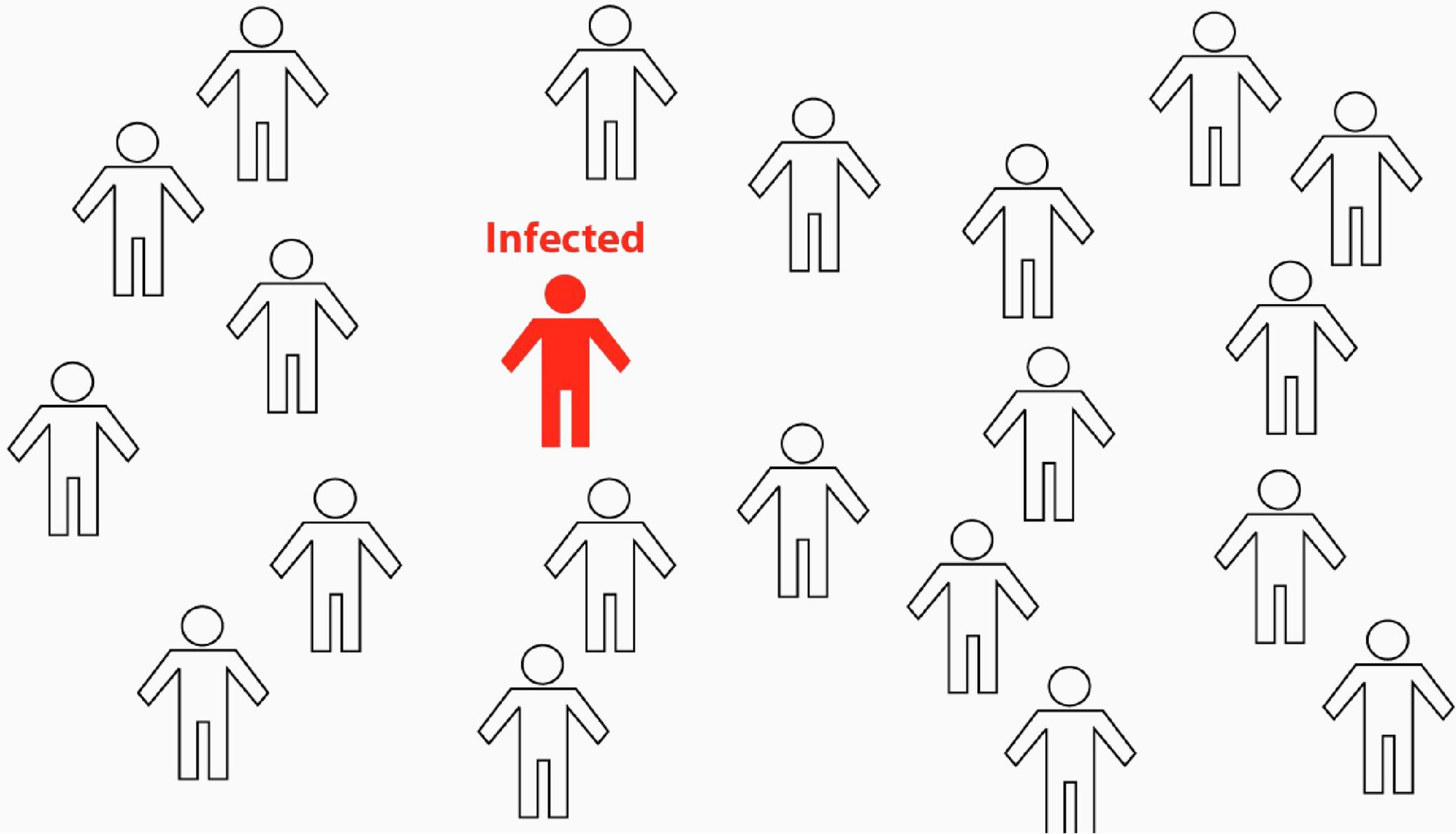
How many people in the population need to be vaccinated to stop the spread of the virus?

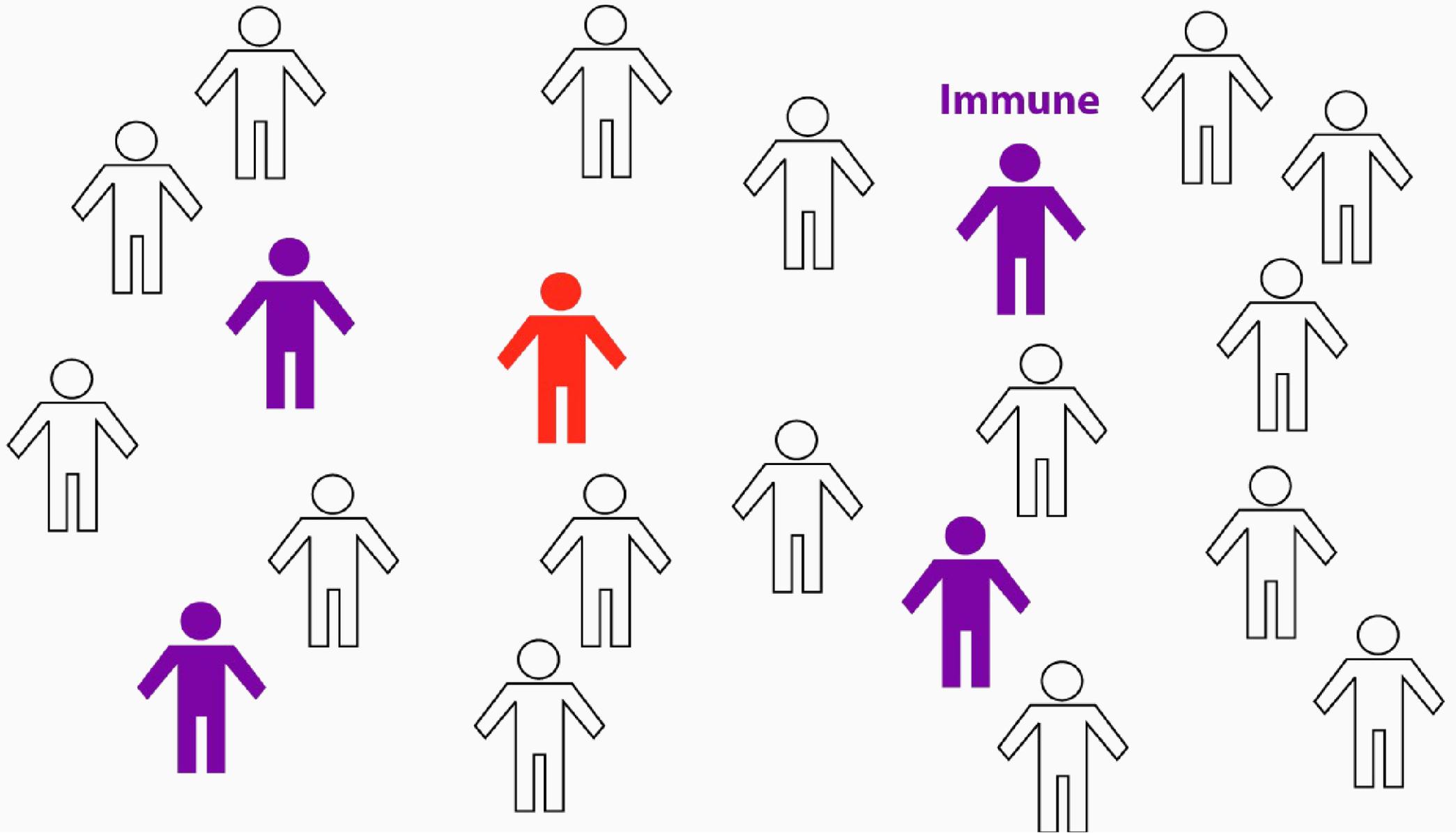
Scientists estimate that somewhere between **70% and 85%** of people need to be immune for herd immunity.

Both natural immunity and vaccines can play a role in achieving that goal.

Getting there will not be easy!

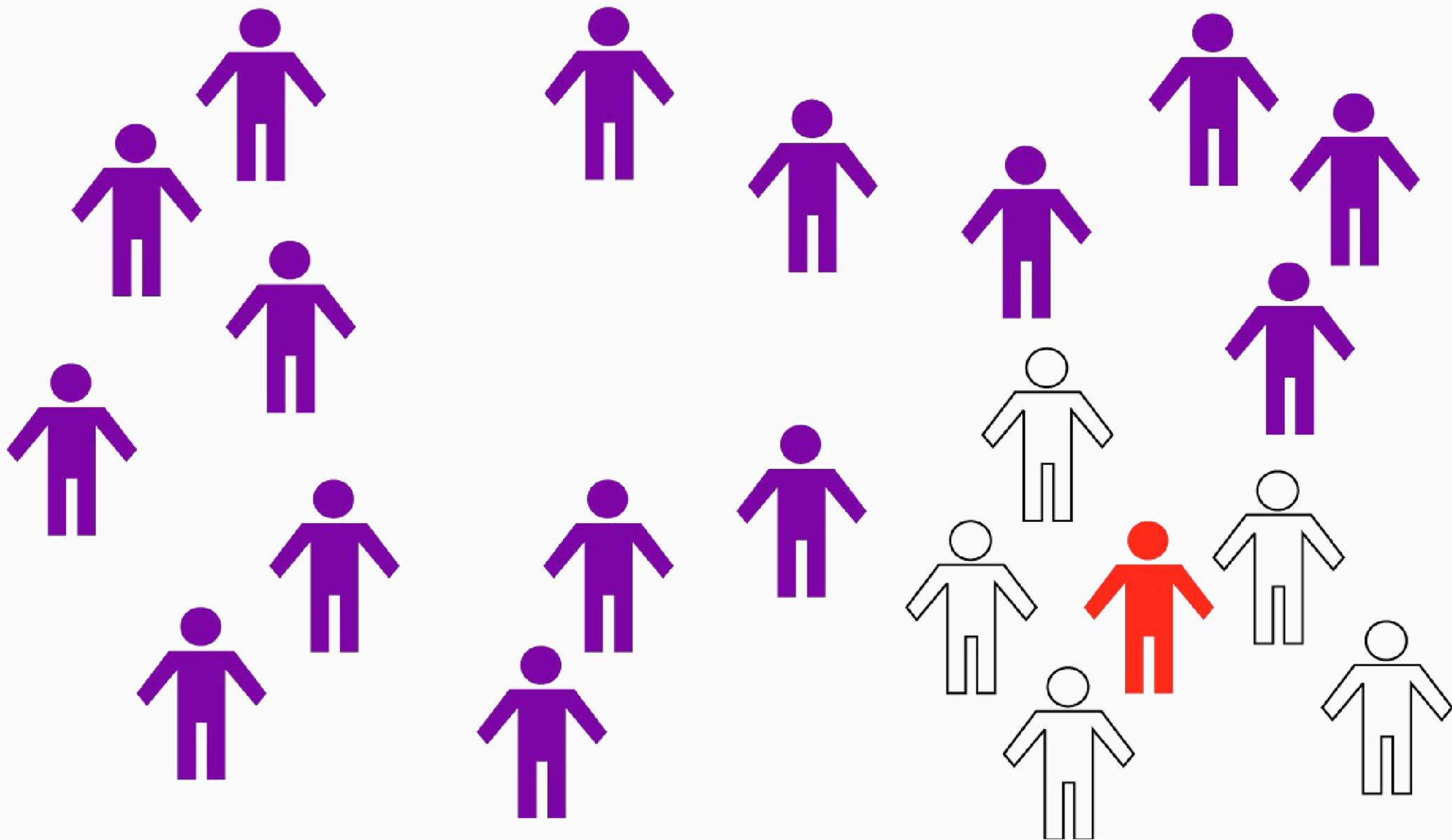
Susceptible





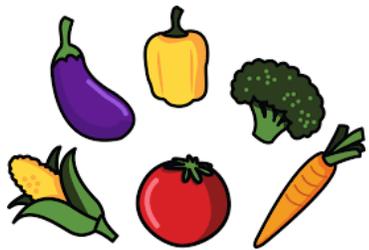






Can vitamins and supplements be taken to prevent SARS-CoV-2 infection?

There are no vitamins or supplements known to help prevent coronavirus, including COVID-19.



✓ Fruits



✓ Vegetables



✓ Exercise



✓ De-Stress



✓ Sleep

Will the vaccines be given to children in the future?

“Hopefully by the time we get to the late spring and early summer we will have children being able to be vaccinated,”

Fauci said at a White House coronavirus briefing.



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