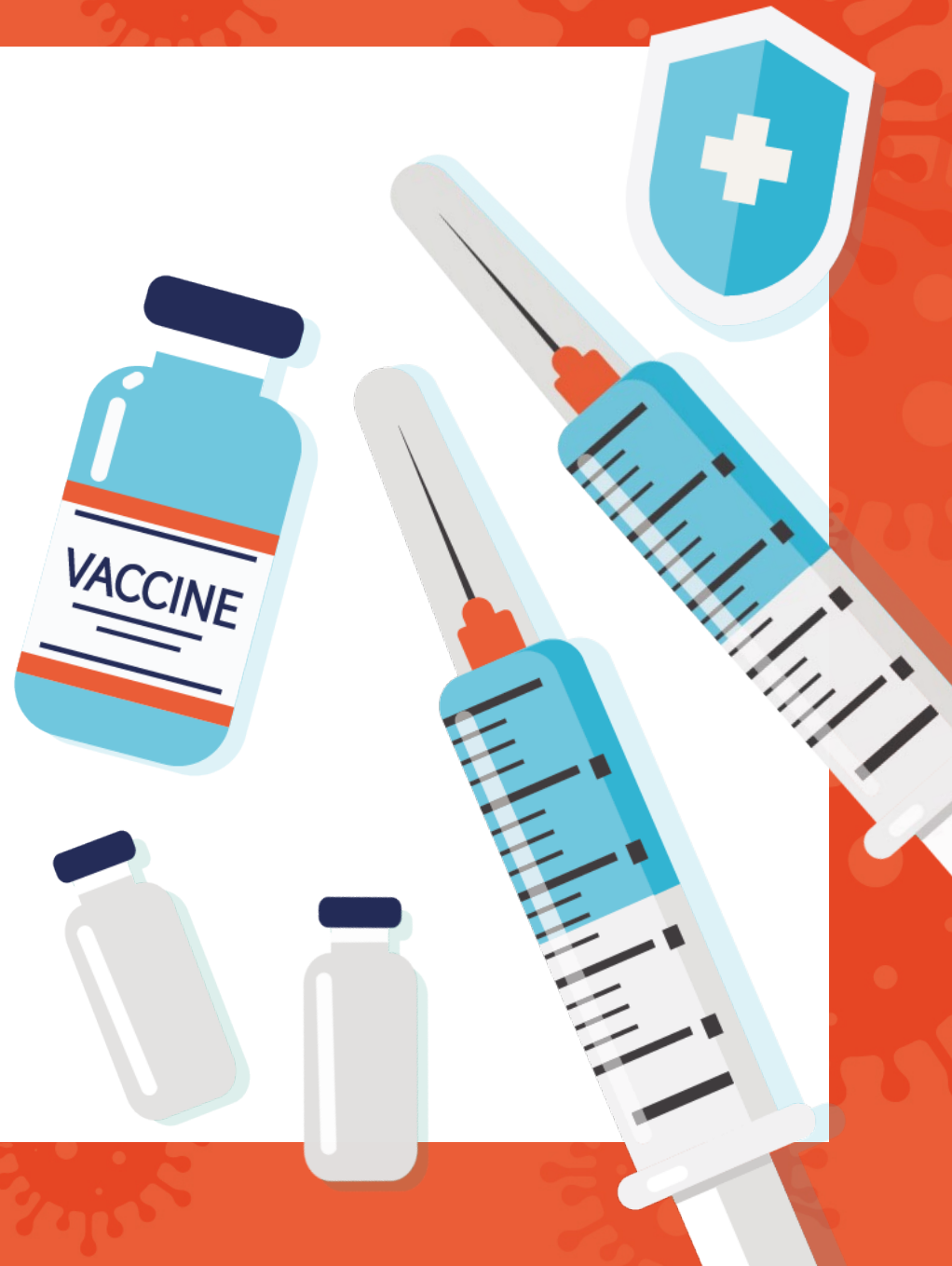
Queen Mary University of London

The Stephen Hawking Foundation

ARE VACCINES SAFE?



V2.0 23 April 2021

Full set of documents, including Powerpoint Show, PDF and Teacher's Notes available at stephenhawkingfoundation.org/vaccines

If you were offered a COVID vaccine today, would you take it?

Hands right **up** for **YES**

Hands **down** for **NO**

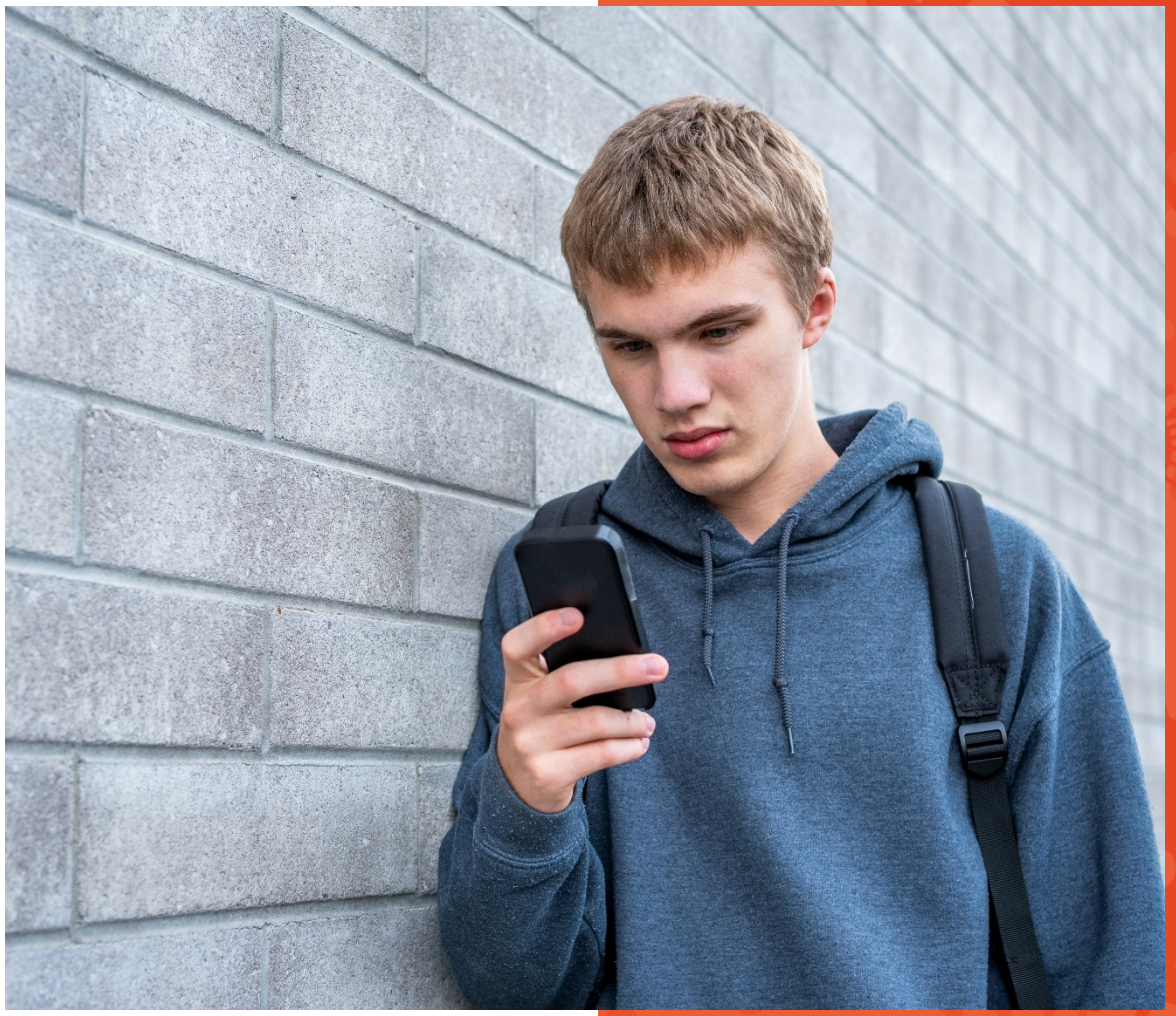
Hands in the **middle** for
'I'M NOT SURE'

How worried are you about the COVID vaccine?

Why?

Here are some common concerns

- I’m worried it was rushed
- I’ve heard scary stories about vaccines and I don’t know what to believe
- I don’t know what’s in it
- I’m worried about side effects
- I’m worried about the long term effects – will it make us ill in the future?



Some people think there's no need

I'm not likely to get COVID

It's no worse than flu

The vaccine won't stop me passing it on anyway

It's a disease for old people

I'm young and healthy and so won't get sick

I've had it so I'm already immune

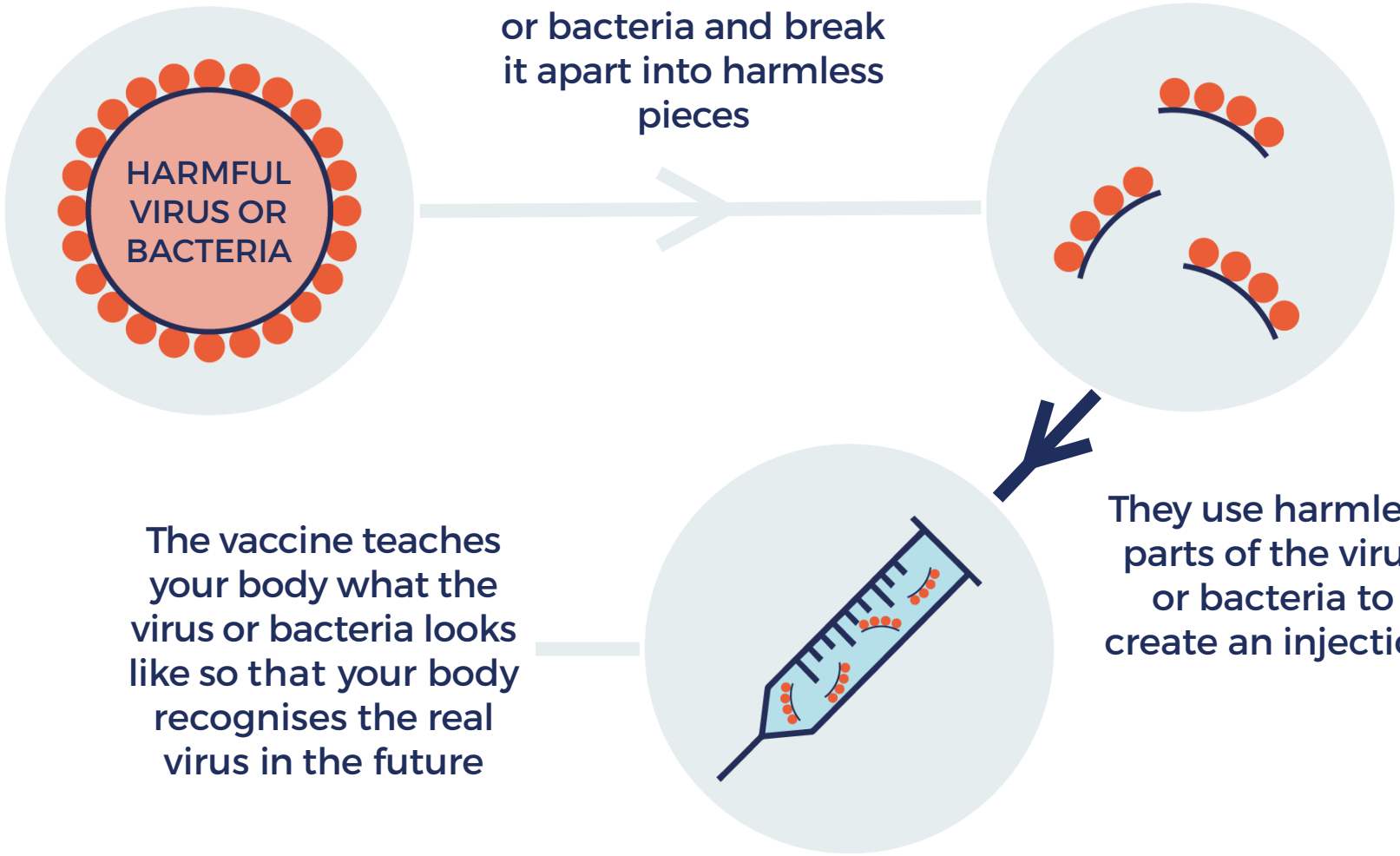
Hardly anyone has died

The vaccine won't work against new strains

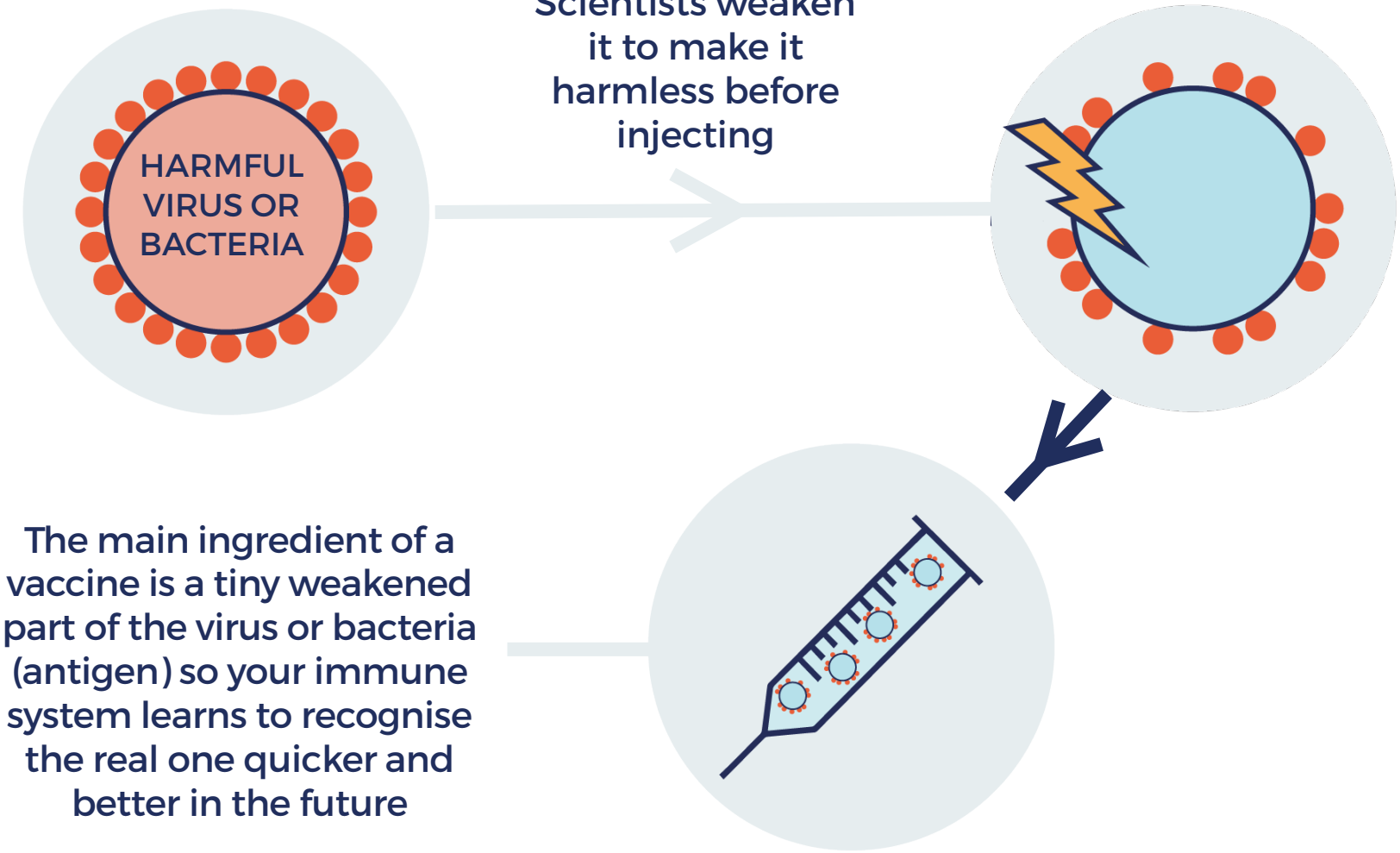
Let's find out if any of this is true....

WHAT ARE VACCINES AND HOW DO THEY WORK?

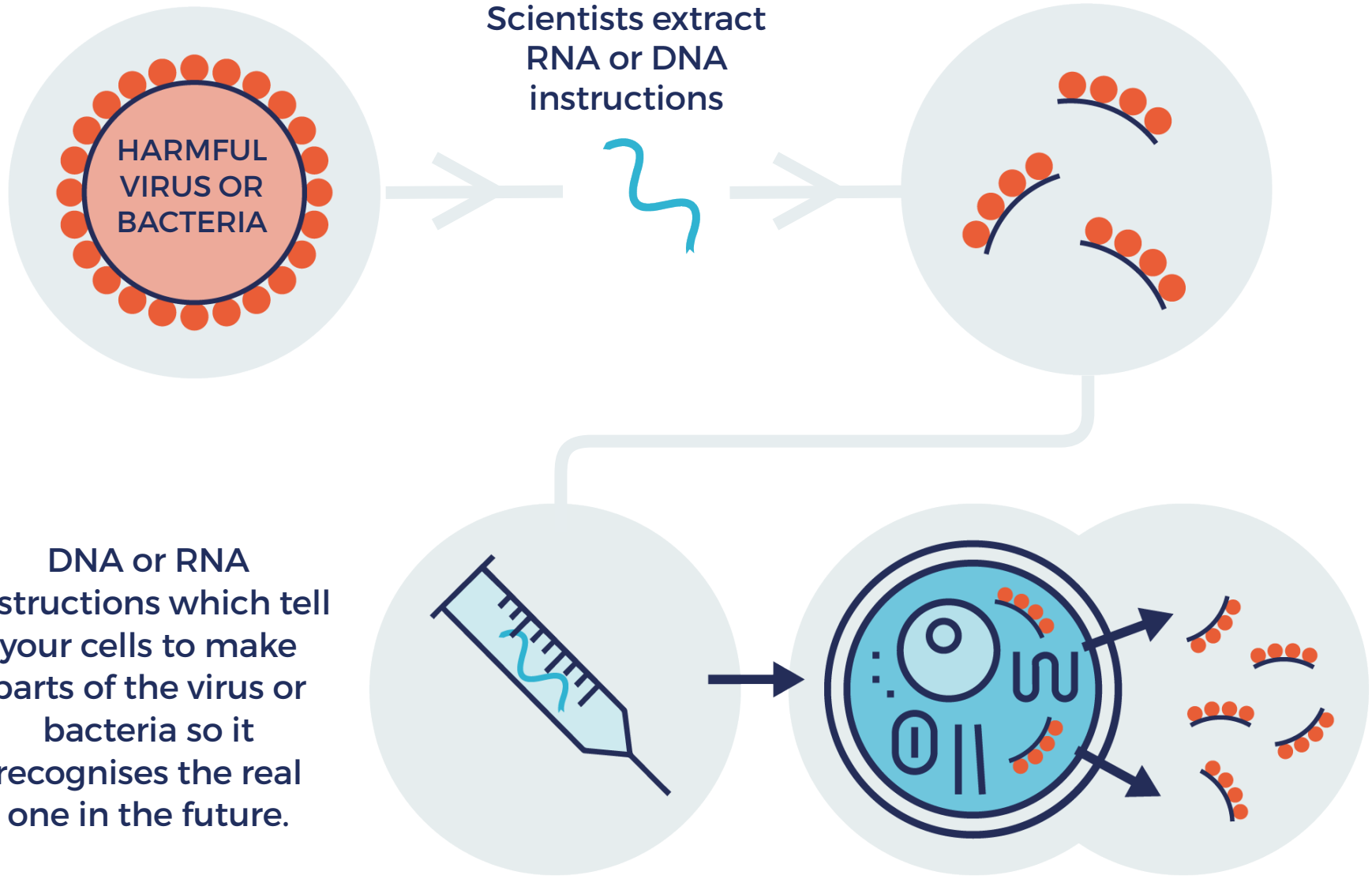
Some vaccines work like this...



Others work like this ...



Or like this ...


HARMFUL VIRUS OR BACTERIA
Scientists extract RNA or DNA instructions
DNA or RNA instructions which tell your cells to make parts of the virus or bacteria so it recognises the real one in the future.

WHY ARE VACCINES USEFUL?

Why are vaccines useful?

- Vaccines mean that diseases which used to kill us have largely disappeared.
- Smallpox, polio and tetanus that used to kill or disable millions of people are either gone or seen very rarely.[9]
- If people stop having vaccines, it allows infectious diseases to spread quickly again.

What would our lives be like if we all stopped having vaccines?

Tetanus

This is a child suffering from the painful muscle contractions of tetanus.

Smallpox

An example of a disease eradicated by vaccination.[11]

Polio

The last case of polio in the UK was in the mid 1980s! [12]

WHEN WILL I GET THE VACCINE?

What about me?

- The first priority was to protect people at high risk – this means older people and people with underlying health conditions. Older people are more likely to suffer serious illness and death from Covid than under 25s, also people with conditions such as diabetes or obesity.
- This means most vaccine programmes started with the oldest people and worked towards the younger ones.
- Some countries decided to vaccinate key workers such as teachers and health care workers early on.
- Israel also decided to vaccinate 16-18 year olds as they are the most likely to spread disease. This also allowed them to take their exams.

When will I get a vaccine?

- Vaccine trials need volunteers to go through the three-stage process. Until recently, all trials for covid vaccines used adult volunteers due to the urgency of the pandemic and ethical concerns about trialling medicines on children and adolescents.
- Trials have now started on children and adolescents for Covid vaccines. A Covid vaccine for children should be ready by the autumn.

What happens when I get vaccinated?

Doctors **want** to convince your body that it's been infected, so that it knows what the real virus looks like.

You might experience: [1]

- The area where the needle went in looking red, swollen and a bit sore for 2 to 3 days.
- Feeling a bit unwell or developing a high temperature for 1 or 2 days.

This is **normal** and **helps your body remember.**

Similar to when you try any new food or take a new medication, an allergic reaction can happen. But for vaccines this is **extremely rare.**

ARE VACCINES SAFE?

What is the evidence?

- Overwhelming medical evidence shows that negative side effects are rare and minor.[2]
- Improved safety means that researchers are sometimes searching for vanishingly small risks.[3]
- Vaccines must undergo stringent safety tests before distribution.[3]
- Nothing in medicine is 100 percent safe. The absolute safety of vaccines cannot be proved, but the relative absence of serious side effects in so many studies shows how safe vaccines are.[4]

DO VACCINES CAUSE AUTISM?

There is no link between vaccines and autism

- In the 1990s, a doctor reported a study on 12 children which he claimed showed that vaccines caused autism.
- Autism is a form of neurodiversity; this means it is a genetically-determined difference in the brain which results in different ways of moving, speaking, seeing the world, and socialising.
- Studies worldwide on hundreds of thousands of children have shown that vaccines do not cause autism.
- The claims caused mass panic about vaccinations and have resulted in many children missing out on vaccines which could have protected them from serious illnesses and in some cases, life long impacts of disease.
- But no link has ever been found between vaccines and autism.

What do you think about ‘evidence’ produced from 12 children compared to evidence from hundreds of thousands of children worldwide?

WHAT ABOUT BLOOD CLOTS?

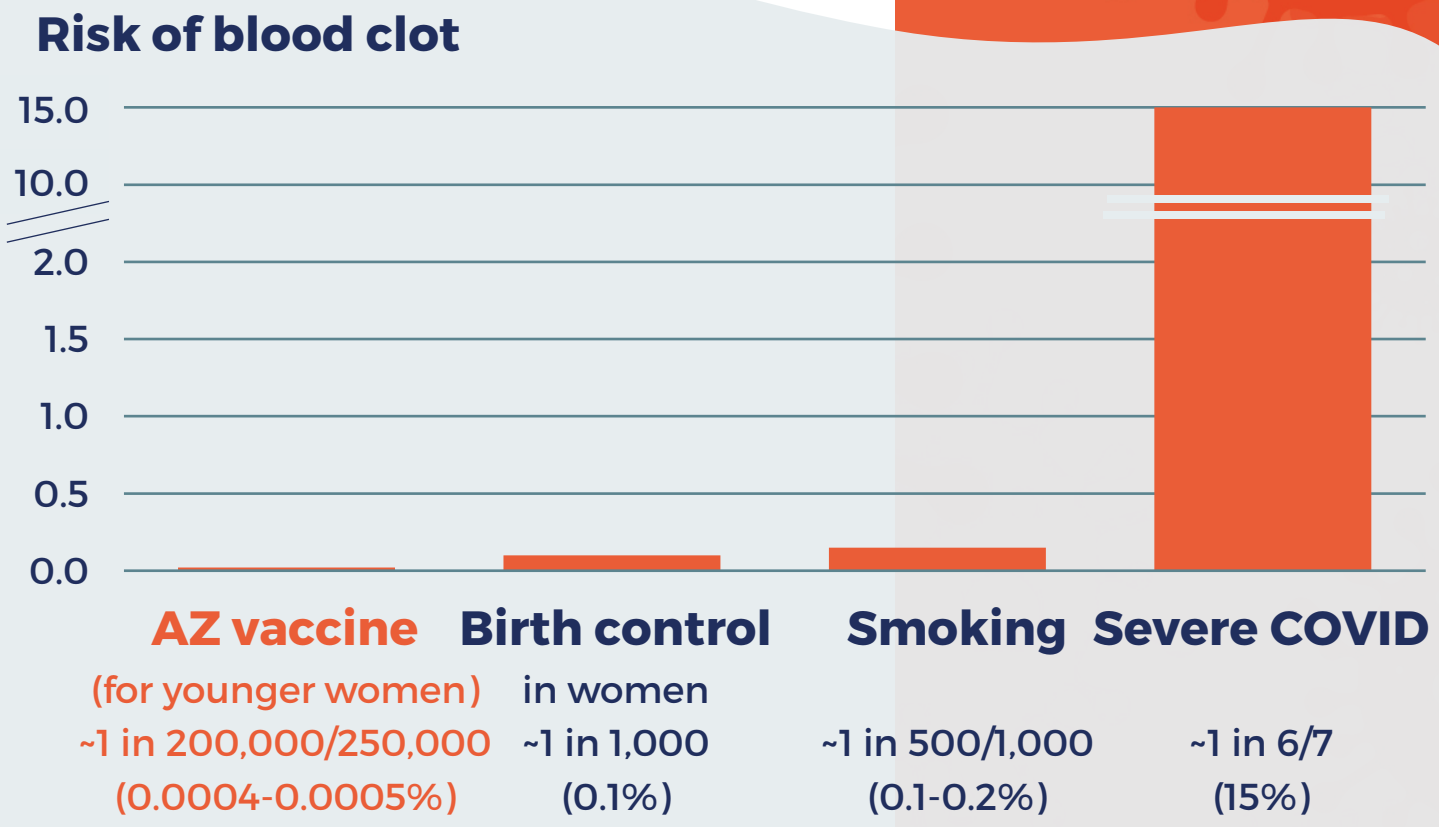
What we know – and what we don't

- Blood clots are now known to be very rarely associated with one of the types of covid vaccines which includes the Astra Zeneca vaccines, the Johnson&Johnson vaccine and the Russian Sputnik V vaccine. These are called the adenovirus vector vaccines.
- The RNA vaccines – Pfizer and Moderna – are extremely rarely associated with another type of blood clot. This is being investigated in the USA.
- It is thought to be caused by an unusual antibody which makes blood clots form in rare places in the body.
- This is an immune response which happens 7-21 days after vaccination. It is not yet known why this happens or to whom although scientists are working on different theories.

How big is the risk?

- This is a very rare side effect which affects young women the most. Covid is still far more dangerous.
- You are more likely to suffer from a blood clot from Covid than from the vaccine.

The Astra Zeneca vaccine is still very safe and effective.



These figures will vary around this estimate according to factors such as age, gender, wealth, ethnicity, access to health care, education, etc.

WHY DO WE NEED A COVID VACCINE?

We need a COVID vaccine because:

- More than three million people have died from COVID
- Society, including education, employment, sport and medical care, has shut down during the COVID pandemic – a vaccine may be the best way we have to open the world up again.
- Long COVID – 1 in 10 people aged between 18-49 who get COVID go on to suffer long COVID which can be very severe and cause life-long health problems such as headaches, brain fog or even damage to your internal organs.
- Worryingly, new data shows that long COVID is affecting both children and adolescents.

Would you get a COVID vaccine to protect your family and friends?

WHAT DOES THE COVID VACCINE DO?

What does the COVID vaccine do?

- The COVID vaccine gives you up to 95% protection against getting COVID, being hospitalized, and getting the severe version of the disease.
- The vaccines significantly reduce transmission. Many people have ‘asymptomatic’ COVID which means they have it without even knowing. But they can pass it on to members of their family such as grandparents.
- Even if you’ve had COVID, scientists still think you should have the vaccine as this will boost your ability to fight the virus if you come into contact with it again.

How much has the vaccine already reduced transmission in the UK?

What does the COVID vaccine do?

- Better protection if you've had the vaccine against a wider number of variants.
- It will help to create community (or "herd") immunity – so that virus levels drop enough for us to get back to our lives.
- Some people can't take the vaccine for medical reasons – they need to be protected by everyone else having it.
- If people don't take the vaccine, the virus will carry on infecting people and the longer it does, the harder it will be to stop because it will mutate.

Should we act as a community for the good of all?

IS THE COVID VACCINE SAFE?

How was the vaccine developed so fast?

Lots of money!

Lots of resources

International effort

Scientists working around the clock

Very few “wasted” days

Stages carried out in parallel

Nothing missed

All safety checks in place

Approved by independent regulatory body

Are you scared about side effects of the COVID vaccine?

- So far, very few side effects have been reported with any of the COVID vaccines.
- To assess adverse reactions, large trials are used in which there is a control group (who take a “placebo”) and all the other variables are controlled.

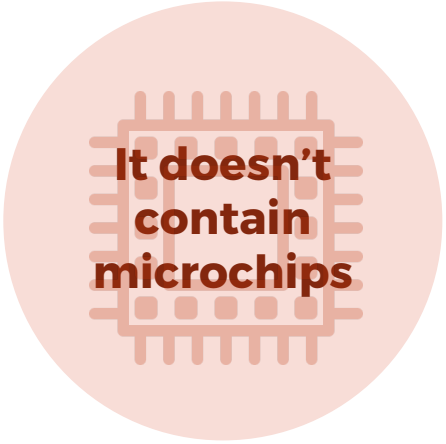
You are much more likely to become seriously ill from COVID than from the vaccine

How are vaccines monitored?

- Health agencies continue to monitor vaccines after they have been approved and are being used.
- Millions of people have been given a COVID-19 vaccine and reports of (more than mild) side effects, such as allergic reactions, have been very rare.
- No serious long-term complications have been reported. [14]

How many millions of people have had the COVID vaccine so far?

What the vaccine doesn't do



What is a conspiracy theory?

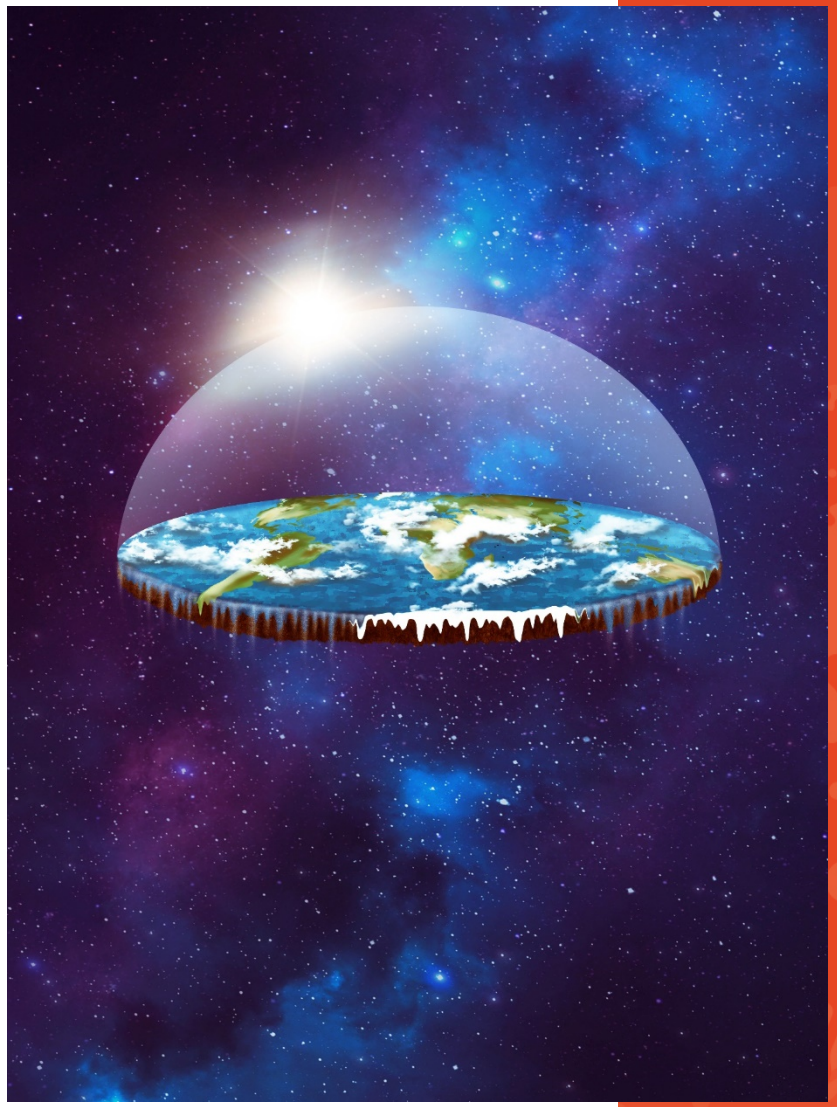
- It is an alternative explanation for an event or a situation that relies on sinister actors and motivations rather than hard evidence.
- Often, conspiracy theories are associated with new technologies or scientific achievement.
- Psychologists believe that the availability of the internet and social media is one reason why conspiracy theories to become more common, as we can now easily access a large amount of unverified information.

Have you heard any conspiracy theories?

Is the Earth really flat?

- A group called the Flat Earthers has tried to persuade us that the Earth is flat. This goes against all the evidence including the images from space!
- Psychology studies show that people who believe in conspiracy theories tend to be more anxious, paranoid, or suspicious compared to people who don't believe in conspiracy theories.
- People believe more strongly in conspiracy theories at times of social and political unrest – such as during a pandemic!

How can you tell fact from fiction?



Where do you get your news?

We get information or news from many places TV, TikTok, Instagram, Twitter, The Government, school, our friends and families, news alerts, rumours.

- News and how it is reported is out of our control, so we need to decide for ourselves what to believe.
- If you just have one source of information, you might not be hearing the whole story.
- Fact-checking and myth-busting are two ways society checks whether news is real.
- You can do it yourself with simple research; listen to different news sources, analyse the results and form your own opinion.

Do you 'think before you forward'?
You can stop fake news spreading by not passing it on.

TikTok

Instagram

BBC NEWS

Does the vaccine go against my religious beliefs or my diet?

- The Pfizer BioNtech vaccine contains no animal products. Previous vaccines, including the Pfizer BioNtech vaccine have been declared halal by Islamic scholars worldwide.
- The **British Islamic Medical Association** has recommended the Astra Zeneca vaccine for members of the Muslim community. There are no animal products in the AZ vaccine.
- The **Hindu Council of the UK** made this statement in January 2021: “We urge all members to dispel rumours that vaccination does contain any animal fat. We have been categorically assured by scientist as well as the government ministers that both vaccines do not contain animal products.”
- **Ethical vegans** are advised that while the vaccines were tested on animals, they contain no animal products and they should still get the vaccine for their own protection and that of others.

WHAT HAPPENS IF YOU GET COVID?

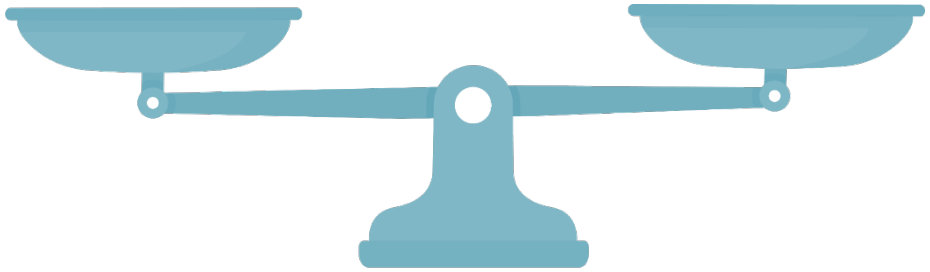
Effects of COVID

- COVID-19 can give you a life-threatening pneumonia
- It's worse than flu (and flu can kill up to 30,000 in a bad flu year)
- It's not just old people, or ill people
- If you get sick, you may need a hospital bed and oxygen, but others may need them too. If the NHS gets overwhelmed, there may not be enough to go round
- Long COVID could leave you with life long health problems
- New data shows long covid can affect children and adolescents

Weighing up the odds

A bit of inconvenience, a day of feeling tired

Much less likely to get sick or get long COVID



Tiny risk of side effects

Protect those around you – especially vulnerable and older people

Play your part in helping to beat the pandemic...

HOW INFORMED DO YOU FEEL?

Now, would you take the COVID vaccine?

Hands right **up** for **YES**

Hands **down** for **NO**

Hands in the **middle** for
'I'M NOT SURE'

What were all those little numbers?

1

9

7

2

11

5

14

We use *references* to cite our sources of information so that other people can go and check them.

References

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Finally, the BIG question

What do YOU think?

We are constantly revising this presentation based on the latest scientific information and feedback from students, teachers and scientists.

Let us have your feedback at stephenhawkingfoundation.org/vaccinesfeedback

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Latest version always available at stephenhawkingfoundation.org/vaccines

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In collaboration with:

IF IDEAS FOUNDATION

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VACCINE CONFIDENCE PROJECT™

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