23 April 2021

Covid-19 Vaccines

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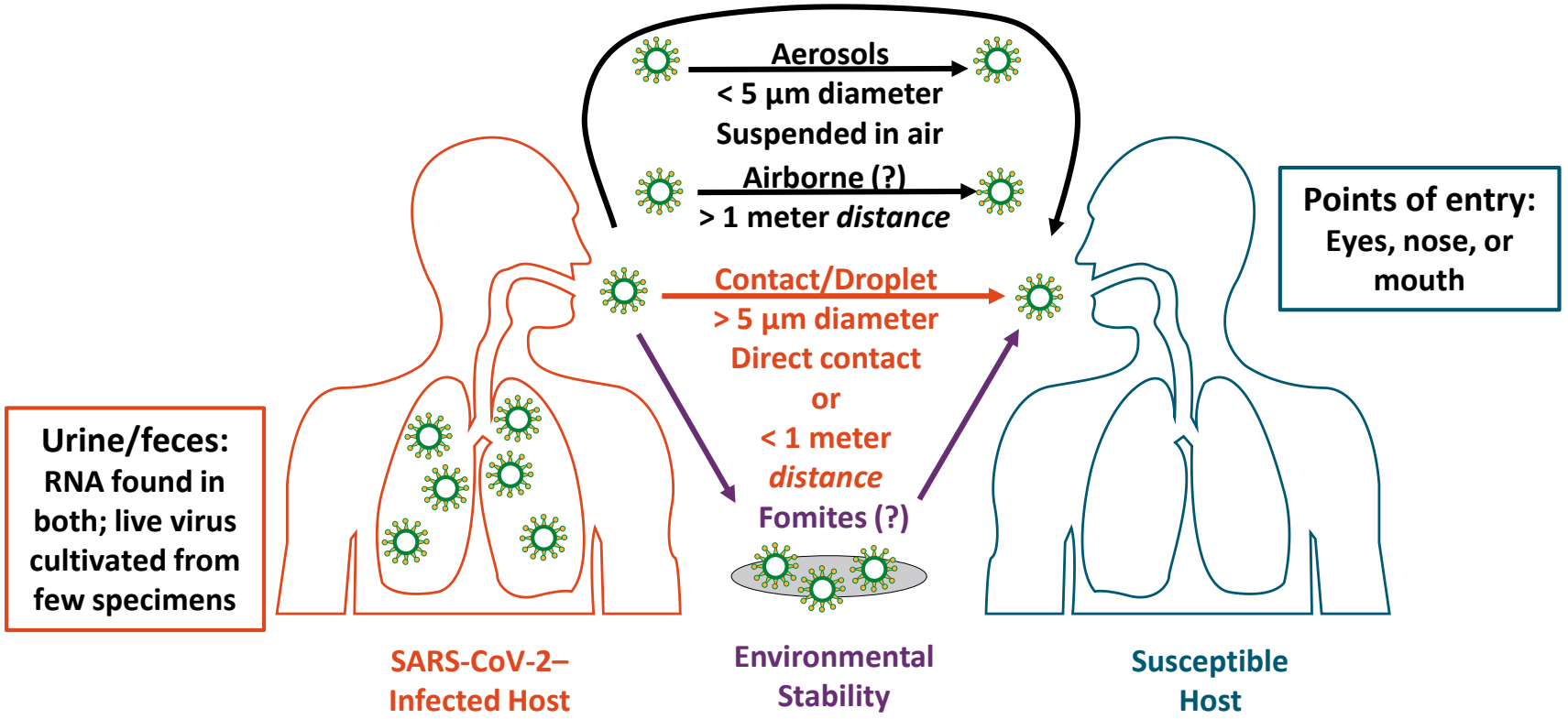
Public Health Covid Briefings

Routes of SARS-CoV-2 Transmission



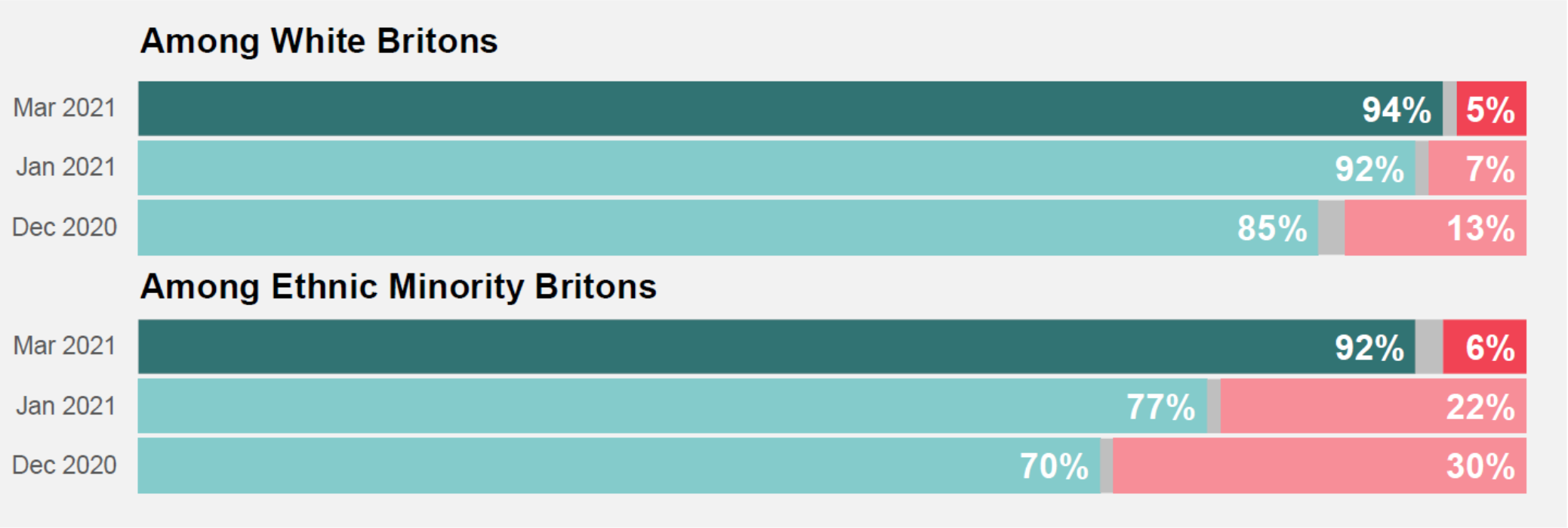
Galbadage. Front Public Health. 2020;8:163. WHO. Scientific Brief. July 9, 2020.

Would you take a vaccine against COVID-19? *By ethnicity*

If a vaccine against COVID-19 was available for anyone who wanted it, how likely or unlikely would you be to take the vaccine?

Definitely/probably would take it/ already had it/ vaccine appt. booked.

Probably/definitely would not take it



Base: 8352 UK adults 16+, KnowledgePanel online survey, 18-24 March 2021
Including adults who are White Britons (7819) and ethnic minority Britons (451) in latest wave.

Four key themes emerge among reasons for changing to more positive view of taking a COVID-19 vaccine

In previous surveys, you mentioned that you probably would not or definitely would not take the vaccine. What has persuaded you to change your mind? Why have you taken the vaccine, or are now more likely to take the vaccine in the future? Please provide as much detail as possible

Travel and vaccine passports *I would take that vaccine to be sure that I could travel and take advantage of other opportunities that may only be available to vaccinated people. However I would still prefer to have an antibody test first.* Female, White, 48

Evidence of impact and effectiveness *I didn't think I would need it. I still don't think I need it. But it is now clear I will help others by having it.* Male, 49, White

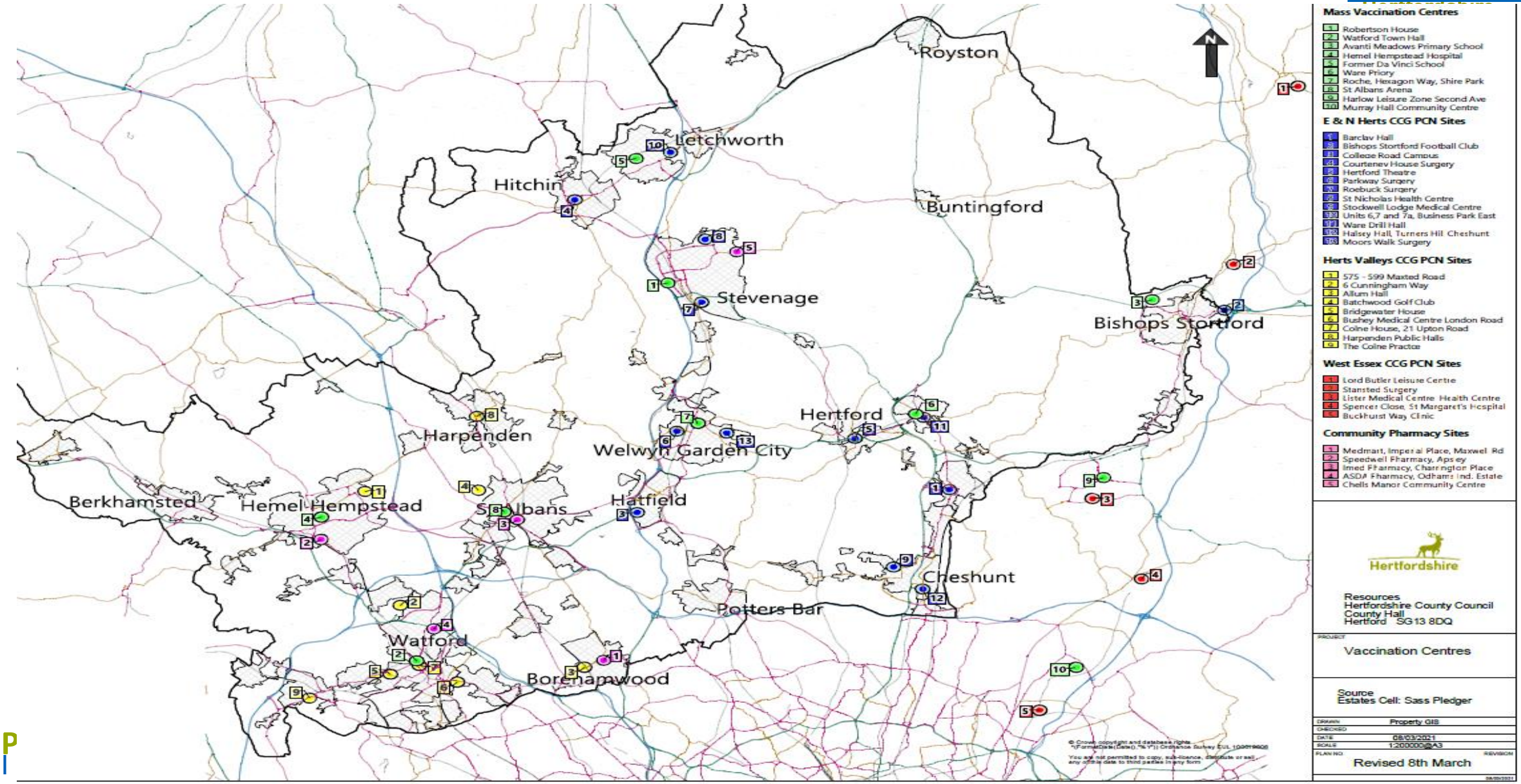
Pressure from others *Moral pressure from family members, the theory that I would be less likely to pass the virus to others.* Female, 62, White

Benefits emerge over time *Time has eased my concerns. As more people are vaccinated around the world and locally I feel more comfortable. I didn't ever think I would out right say no to a vaccine but I wasn't jumping up to be first in line. Now I'm at a point where I would happily get it tomorrow.* Female, Pakistani, 32

Base: 278 UK adults 16+ who had changed their views on COVID-19 to be more positive, KnowledgePanel online survey, 18-24 March 2021

Ipsos MORI Attitudes to Vaccines KnowledgePanel Wave 10 PUBLIC

Vaccination sites across Hertfordshire and West Essex



Why we use vaccines

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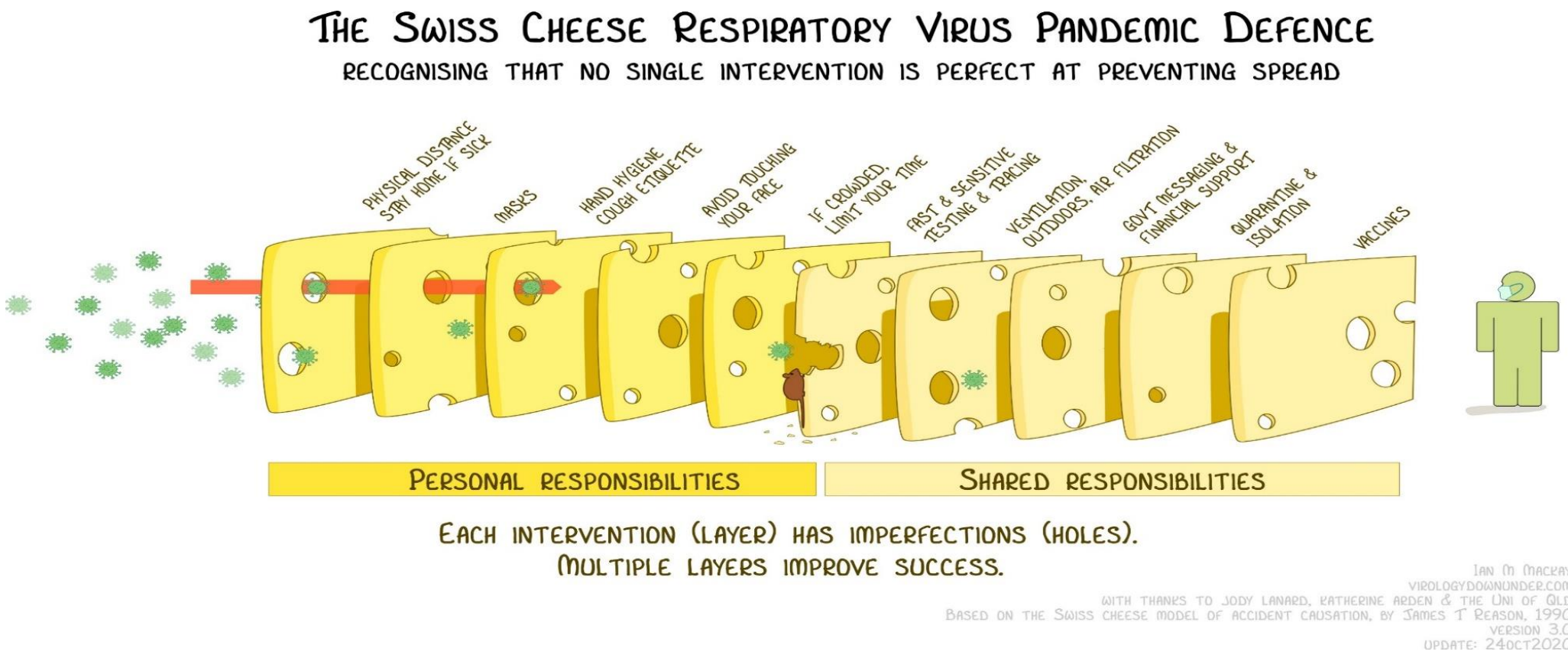
- **Vaccines can prevent infectious diseases.** Examples of vaccine-preventable diseases are: measles, polio, hepatitis B, influenza and many others.
- When most people in a community are vaccinated against a disease, the ability of the pathogen to spread is limited. This is called 'herd' or 'indirect' or 'population' immunity.
- When many people have immunity, this also indirectly protects people who cannot be vaccinated, such as very young babies and those who have compromised immune systems.

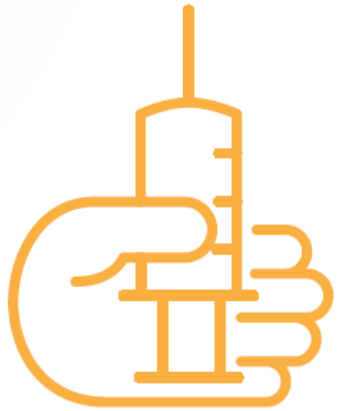
Keep going with prevention & control



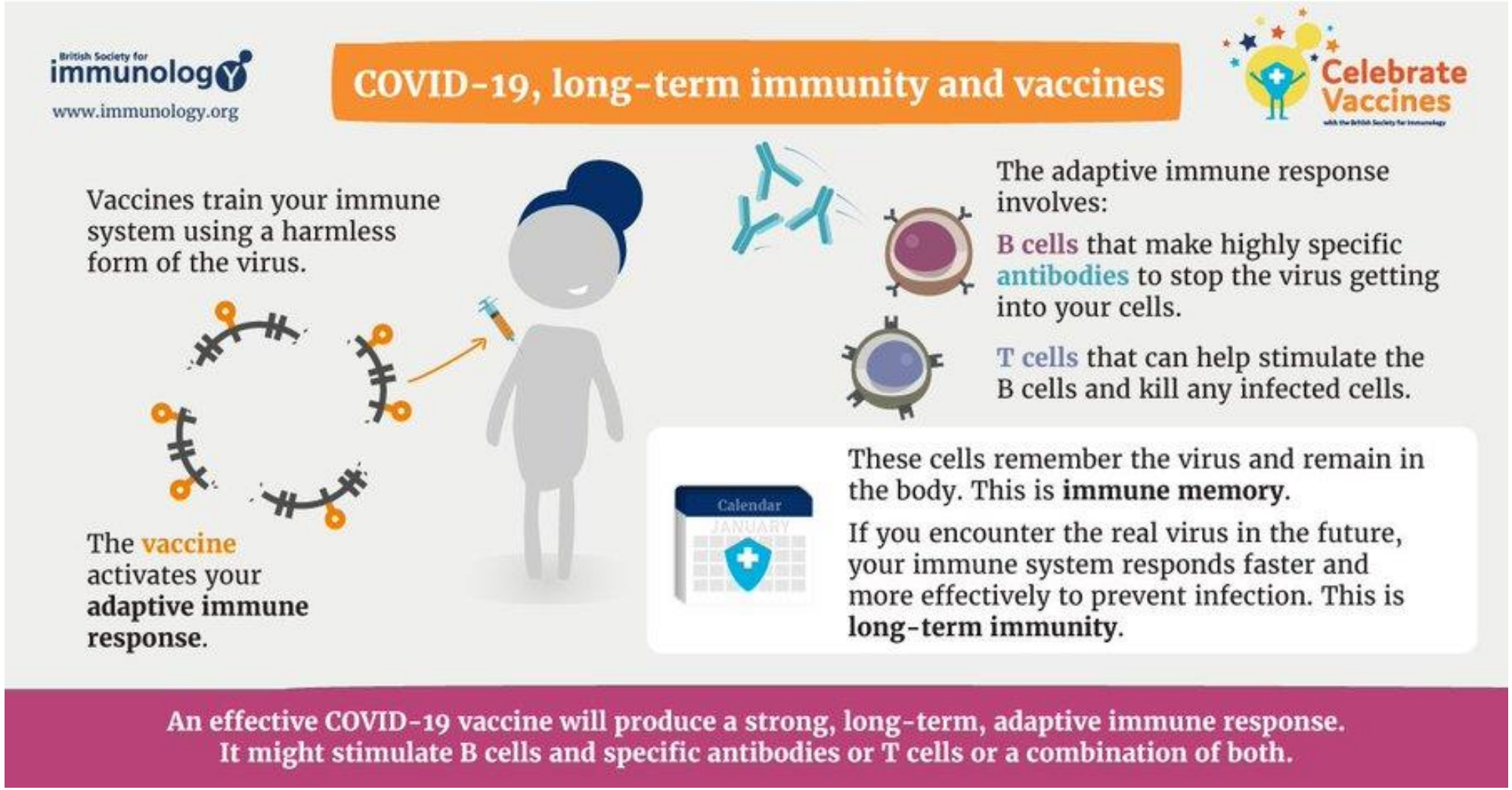
How vaccines work

- Vaccines greatly reduce the risk of infection by training the immune system to recognize and fight pathogens such as viruses or bacteria
- Vaccines safely deliver an **immunogen** which is a *specific type of antigen that elicits an immune response*, to train the immune system to recognize the pathogen when it is encountered naturally.

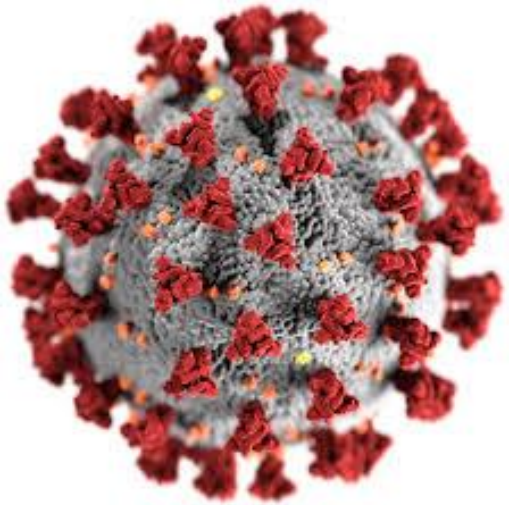
Put crudely, vaccines make your body think it has been infected, or present an infections agent to it so your body recognises it when it comes back

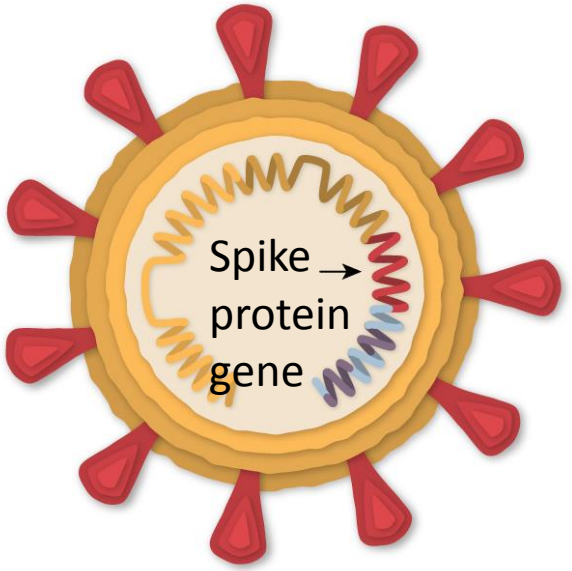


There are multiple types….


British Society for immunology
www.immunology.org
COVID-19, long-term immunity and vaccines
Celebrate Vaccines
Vaccines train your immune system using a harmless form of the virus.
The vaccine activates your adaptive immune response.
The adaptive immune response involves:
B cells that make highly specific antibodies to stop the virus getting into your cells.
T cells that can help stimulate the B cells and kill any infected cells.
Calendar
JANUARY
These cells remember the virus and remain in the body. This is immune memory.
If you encounter the real virus in the future, your immune system responds faster and more effectively to prevent infection. This is long-term immunity.
An effective COVID-19 vaccine will produce a strong, long-term, adaptive immune response.
It might stimulate B cells and specific antibodies or T cells or a combination of both.

SARS-CoV-2





Types of SARS-CoV-2 vaccines for COVID-19

Viral vector vaccines

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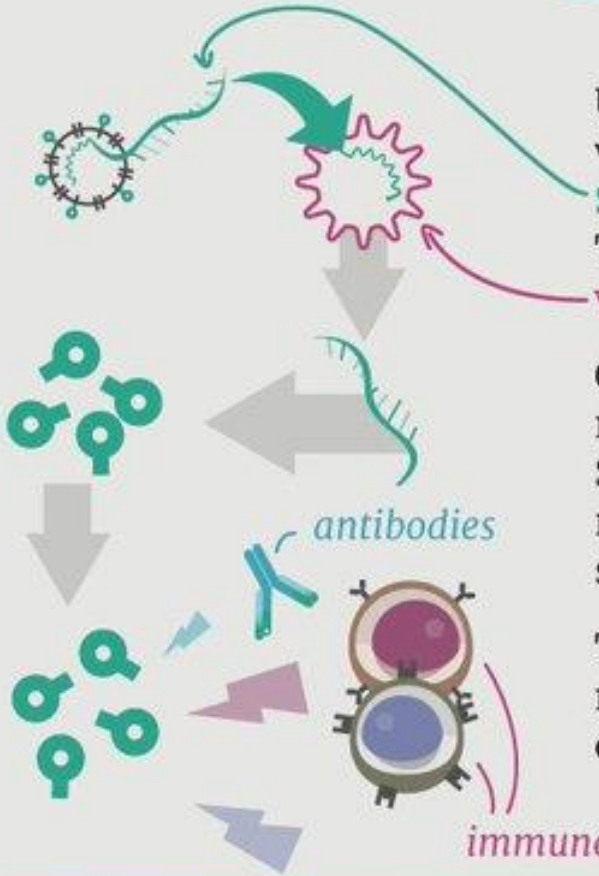

Use an unrelated harmless virus, modified to deliver **SARS-CoV-2 genetic material**. The delivery virus is known as a **viral vector**.

Our cells use the genetic material to make a specific SARS-CoV-2 protein, which is recognised by the immune system to trigger a response.

This response builds immune memory, so your body can fight off SARS-CoV-2 in future.

Considerations

Generate strong immune response.

May need to be stored at specific low temperatures.

Examples in human use

University of Oxford/AstraZeneca COVID-19 vaccine

Ebola vaccine

In clinical trials for COVID-19

Jannsen, Cansino, Gamaleya

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Types of SARS-CoV-2 vaccines for COVID-19

Genetic vaccines
(nucleic acid vaccines)

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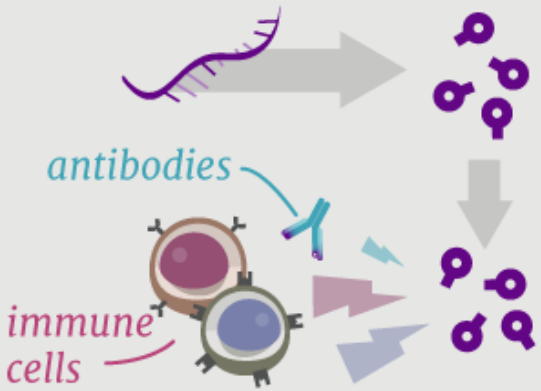
Contain a segment of **SARS-CoV-2 virus genetic material** that codes for a specific protein. Can be DNA or RNA.

Our cells use the genetic material to make the SARS-CoV-2 protein, which is recognised by the immune system to trigger a response.



This response builds immune memory, so your body can fight off SARS-CoV-2 in future.

Considerations

Low cost and fast to develop.

May need to be stored at specific low temperatures.

Examples in human use

Pfizer/BioNTech & Moderna COVID-19 vaccines

In clinical trials for COVID-19

Imperial College London

Hertfordshire

Types of SARS-CoV-2 vaccines for COVID-19

Protein vaccines

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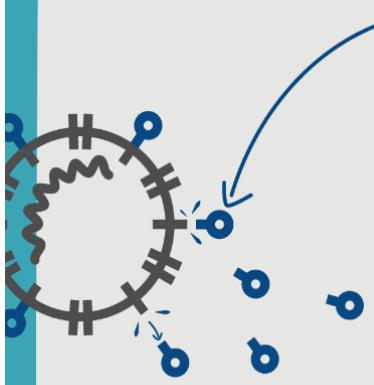
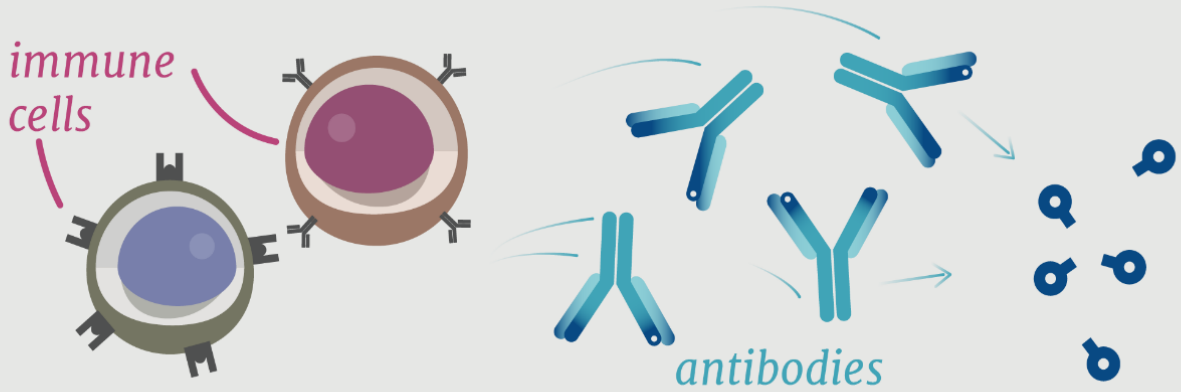


Contain **proteins** from the SARS-CoV-2 virus, which are recognised by the immune system to trigger a response.

Can be whole proteins, protein fragments, or many protein molecules packed into nanoparticles.

This response builds immune memory, so your body can fight off SARS-CoV-2 in future.



Considerations

Have good previous safety records.

Usually administered with an adjuvant to boost immune response.

Examples in human use

Hepatitis B vaccine

In clinical trials for COVID-19

Novavax, Sanofi/GSK

Celebrate Vaccines

What's in a vaccine?

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Water
The main ingredient.

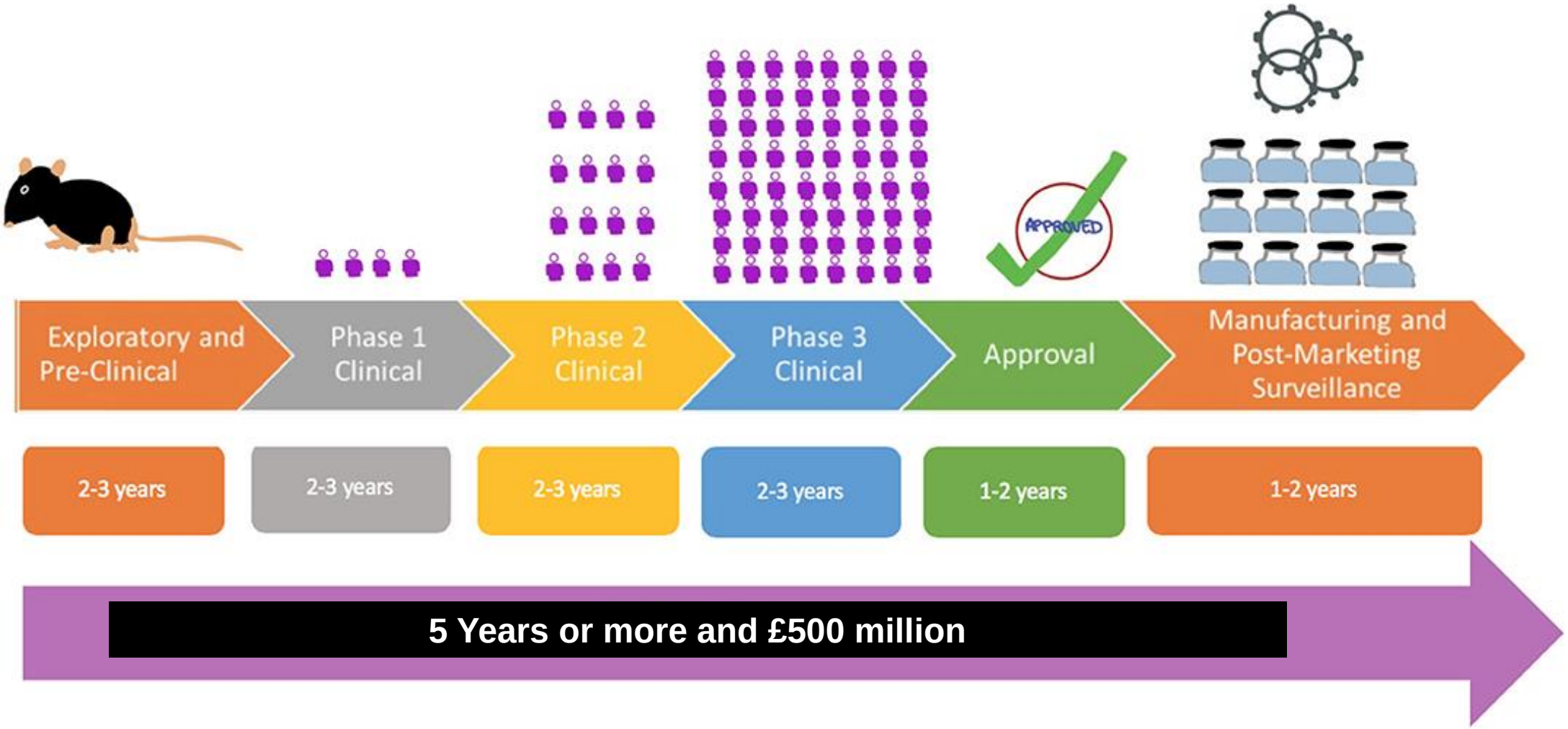
Active ingredient
A very small amount of a harmless form of the bacteria or virus you are immunising against.

Preservatives and stabilisers
Maintain vaccine quality, safe storage and prevent contamination.
Example: Sorbitol; naturally found in fruit in larger amounts.

Adjuvants
Create a stronger immune response to the vaccine. Pose no significant risk to health in the very small quantities used.
Example: Aluminium; naturally found in drinking water at higher levels.

Residual traces of substances that have been used during vaccine manufacture, measured as parts per million or billion in the final vaccine.
Example: Formaldehyde; naturally found in human body.

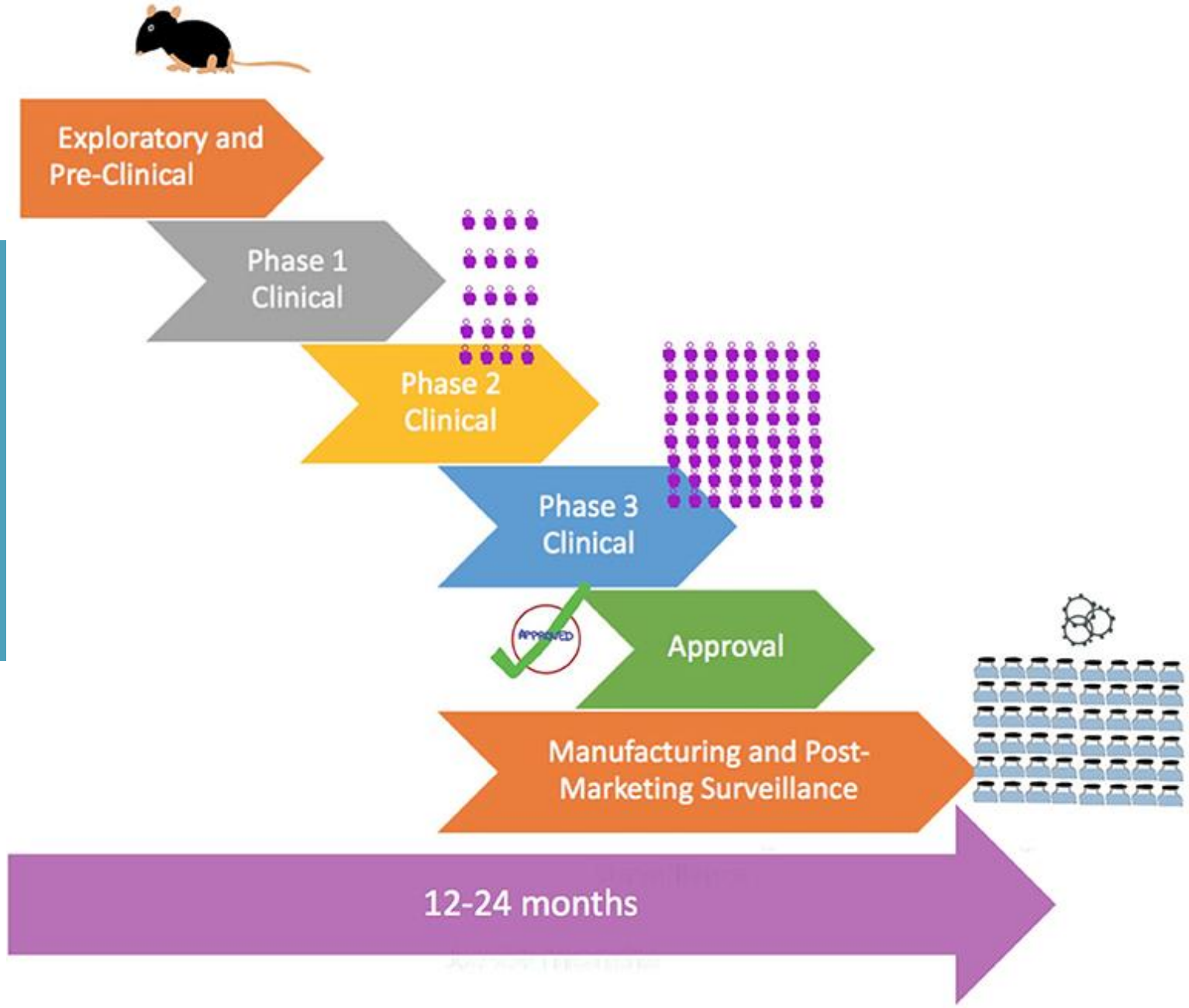
Normal process

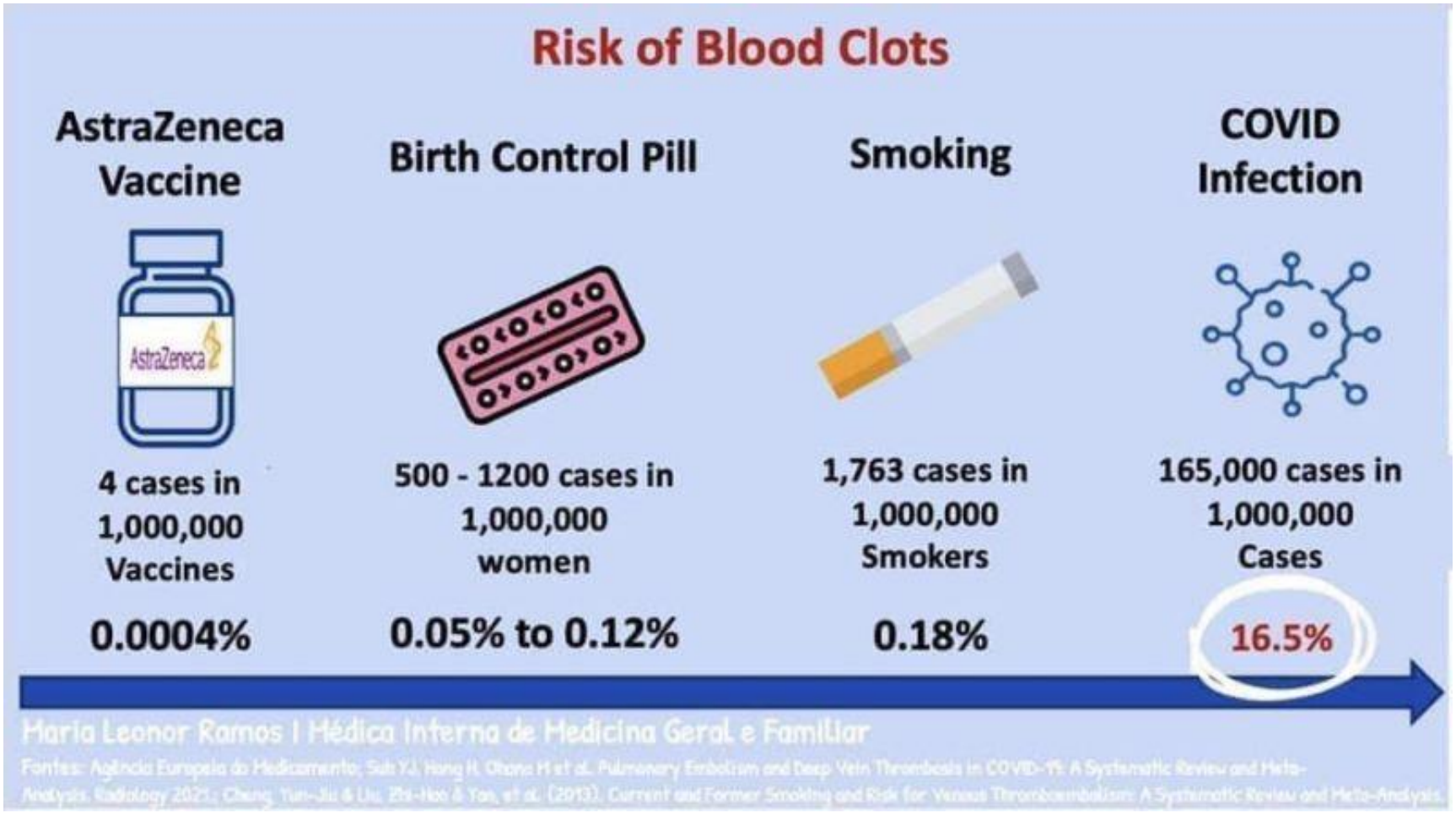


Covid Timeline

Assumes Partnership, Funding and companies and labs who normally compete share data

Also assumes any vaccine which fails any stage work stops there and work and money shifts to successful ones (which has happened)




Risk of Blood Clots
AstraZeneca Vaccine
Birth Control Pill
Smoking
COVID Infection
AstraZeneca
4 cases in 1,000,000 Vaccines
500 - 1200 cases in 1,000,000 women
1,763 cases in 1,000,000 Smokers
165,000 cases in 1,000,000 Cases
0.0004%
0.05% to 0.12%
0.18%
16.5%
Maria Leonor Ramos | Médica Interna de Medicina Geral e Familiar

How does the risk of serious side-effects from the AstraZeneca vaccine compare with other risks?

Chance in a million of...	25-year-old	55-year-old
serious harm due to vaccine side-effects 	**11** in a million	**4** in a million
dying with coronavirus 	**23** in a million	**800** in a million
dying due to an accident or injury 	**110** in a million	**180** in a million
dying in a road accident 	**38** in a million	**23** in a million
being hit by lightning this year 	**1** in a million	**1** in a million

Figures show the chance of dying with coronavirus since the start of the pandemic. Figures for accidents and car crash fatalities are for 2018

Source: Winton Centre for Risk and Evidence Communication

BBC

Key Messages

- Behave as if everyone you meet outside your home is infected and you are too
  - 2m Distance **even with a mask**, avoid crowds, face coverings (2 layers min, preferably three), hand hygiene
- There is no alternative to people complying with the rules. The more non compliance
  - the longer the virus circulates
  - the longer the restrictions
  - The more NHS staff sickness
  - The longer it takes to vaccinate
  - The more new variants will emerge and we risk”vaccine escape”

If you want to get out of lockdown, your only real option is compliance otherwise we will be here till well after Easter

Thank You!

More Materials

http://www.hertfordshire.gov.uk/coronavirus

https://www.hcpa.info/covid-19-vaccinations/

https://www.immunology.org/coronavirus/vaccine-engagement-starts-home

Thanks to

British Society for immunology