

# Covid-19

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# Overview

- ▶ 1. SARS–CoV–2 and Covid-19
- ▶ 2. What is a vaccine?
- ▶ 3. Vaccine development/myths
- ▶ 4. Covid-19 vaccines
  - Viral Vector – Oxford-AstraZeneca
  - mRNA type – Pfizer-BioNTech (and Moderna)
- ▶ 5. Biblical principles
- ▶ 6. Ethical considerations
- ▶ 7. Resources

# 1. SARS-CoV-2

- ▶ SARS-CoV-2 is the virus that causes the illness Covid-19
- ▶ 3 main symptoms: cough, fever, loss of smell
- ▶ Some other symptoms: body/muscle aches, shortness of breath, headache, diarrhoea, fatigue, confusion
- ▶ 18<sup>th</sup> Jan 2021 - Johns Hopkins data:
  - Global confirmed cases 95,132,795
  - Global deaths 2,032,636
  - UK - cases 3,405,740 and deaths 89,429

# Covid-19

- ▶ Up to 30% of cases are asymptomatic
- ▶ Majority have mild to moderate illness
- ▶ 10-15% severe illness, 5% critical (WHO Sept 19)
- ▶ 1% mortality UK (Imperial College London Oct 2020)
- ▶ Risk of death doubles with every 8 years of increasing age
- ▶ 80% of deaths have been in the over 65 age group (CDC)
  
- ▶ Risk factors: age, underlying health conditions (e.g. COPD, obesity, diabetes), gender (male), ethnic background
  
- ▶ Long Covid – symptoms lasting longer than 12 weeks

# Is it worse than flu?

- ▶ Yes
- ▶ Spreads more easily
- ▶ More deadly (3-5x)
- ▶ No pre-existing immunity
  
- ▶ “Since 1959, which is when ONS monthly death records began, the number of deaths due to influenza and pneumonia in the first eight months of every year have been lower than the number of COVID-19 deaths seen, so far in 2020”
- ▶ Sarah Caul, Head of Mortality Analysis ONS

# Covid deaths (ONS data 18.1.21)

- ▶ ONS data 2020 (registered by 9.1.21)
- ▶ 550,238 deaths in England
- ▶ 50,882 more than the 5 year average (10.2%)
- ▶ 71,110 recorded as Covid (12.9%)
- ▶ Leading cause of death 2020 (1<sup>st</sup> death 30<sup>th</sup> January 2020)

# How to deaths compare?

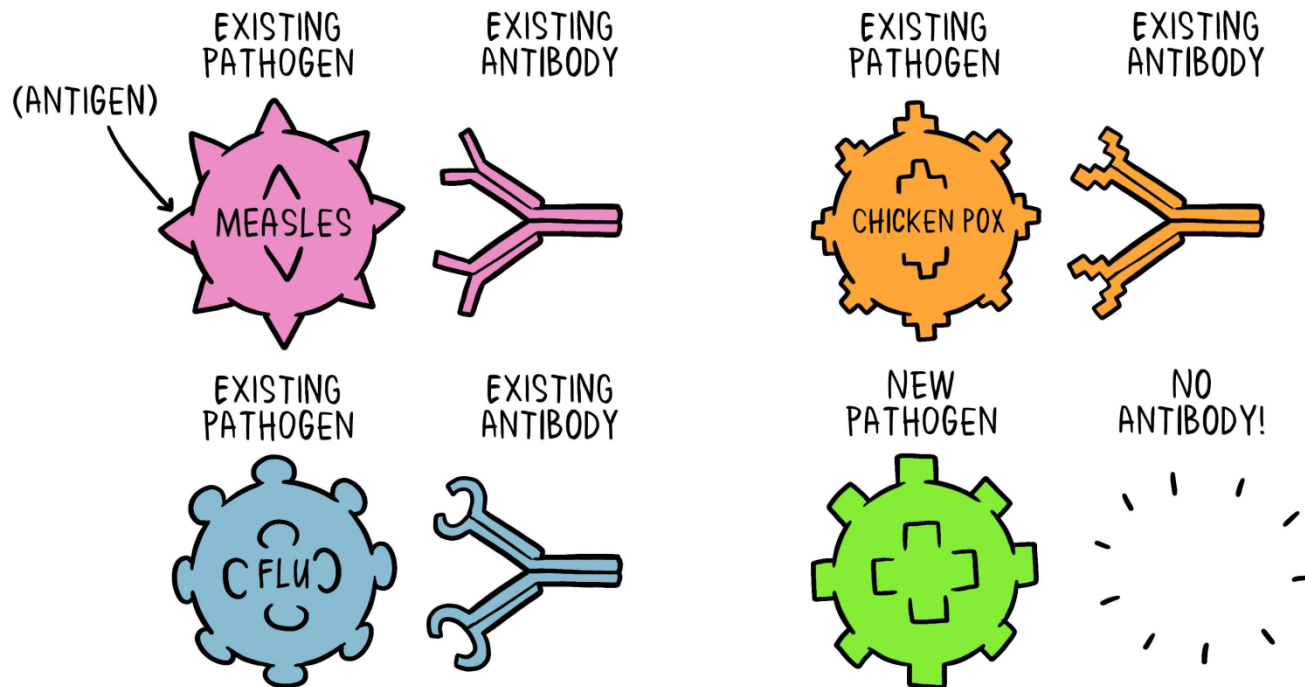
- ▶ 2019 data
- ▶ E&W 530,841 deaths = 1454 per day (ONS)
- ▶ E&W Dementia leading cause of death 66,424
  
- ▶ GB 1,752 road deaths (.gov.uk)
- ▶ UK Deaths in people with HIV 622 (PHE)
- ▶ England Worst year for flu recently 17/18 approx. 22,000 deaths (PHE)

## 2. What is a vaccine?

- ▶ Preventative medicine
- ▶ Stimulates the body's immune system to produce antibodies to fight a future infection
- ▶ Edward Jenner and Smallpox (1796)
- ▶ Usually a weakened version of the pathogen
- ▶ Polio, Tuberculosis (TB), Hepatitis, Measles-Mumps-Rubella (MMR), Meningitis, Influenza, Human papillomavirus (HPV)



# How do vaccines work? (WHO)

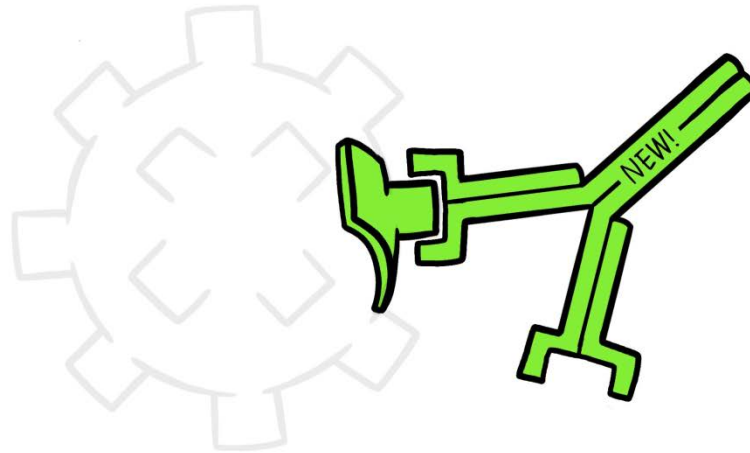


- ▶ When a new pathogen enters the body, it produces a new antigen. For every new antigen, the body needs to build a specific antibody that can grab onto the antigen and defeat the pathogen

# How do vaccines work? (WHO)

VACCINE

NEW ANTIBODY



- ▶ A vaccine is a tiny weakened, non-dangerous fragment of the organism, and includes parts of the antigen. It's enough that the body can learn to build the specific antibody. Then, if the body encounters the real antigen later, as part of the real organism, it already knows how to defeat it.

# 3. Vaccine development/myths

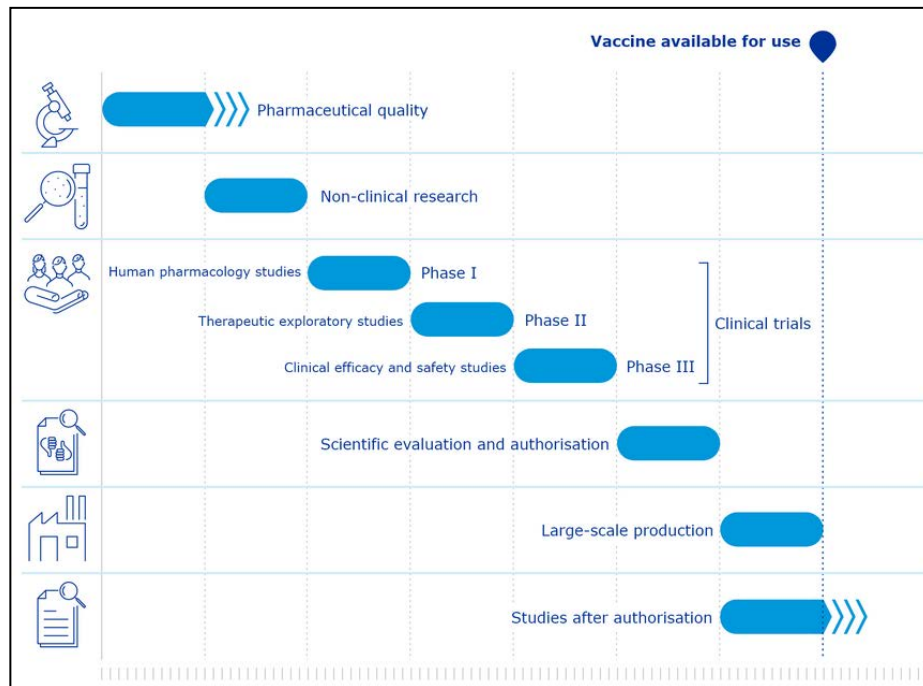
- ▶ Regulatory requirements (MHRA)
  - ▶ Speed
  - ▶ Safety
  - ▶ Indemnity scheme
  - ▶ Social Media
- 
- ▶ Be careful where you get your information!
  - ▶ (Useful resources listed at the end of the slides)

# Speed

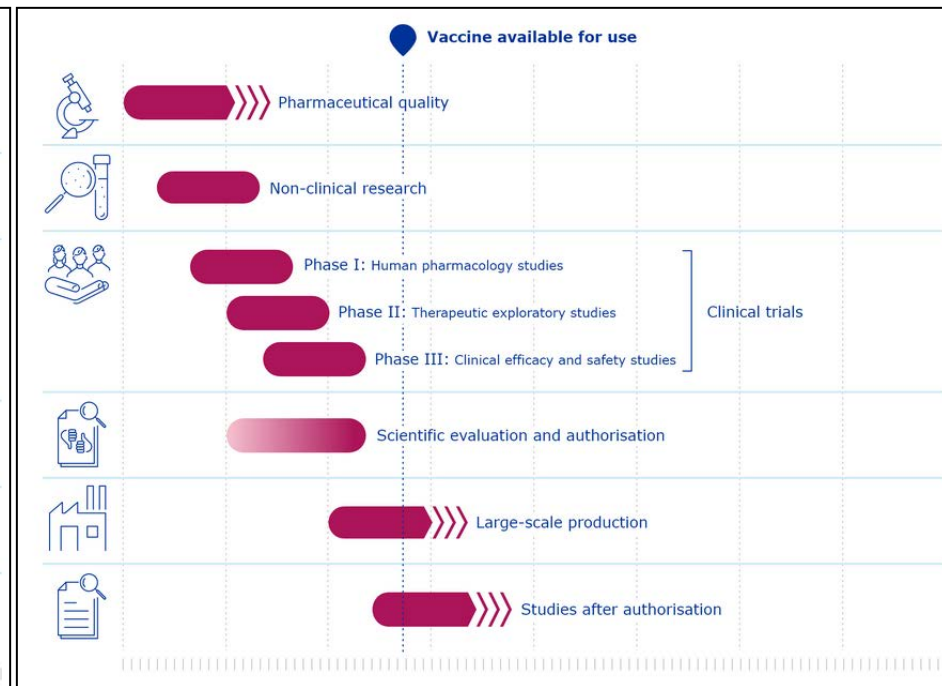
- ▶ Already knew about SARS and MERS and the 'spike' protein
- ▶ Oxford vaccine – expecting disease X
- ▶ Funding no issue and willing volunteers
- ▶ High prevalence of the illness
- ▶ Processes in parallel

# Speed

## Standard vaccines



## Covid-19 vaccines



Source: European Medicines Agency

COVID-19 vaccines: development, evaluation, approval and monitoring

# Safety

- ▶ Every vaccine or medicine will have some side effects
- ▶ Most side effects similar to other vaccines
- ▶ Sore arm, headache/muscle aches, mild temperature
- ▶ Severe adverse reactions rare and similar to placebo group
- ▶ No long term data on the vaccine or on covid

# Is it a side effect?

- ▶ If we vaccinate 10 million people and the vaccine had no side effects whatsoever, then over the following two months we can nonetheless expect that:
  - ▶ 4,025 of those vaccinated will have a heart attack.
  - ▶ 3,975 will have a stroke.
  - ▶ 9,500 will have a new diagnosis of cancer.
  - ▶ A further 14,000 will, unfortunately, die.
- ▶ Norwegian Care Home deaths, 33 following Pfizer vaccine vs 400 per week expected deaths

# Indemnity Scheme

- ▶ Vaccines are given to millions, so likely that a very small number of people will have a severe reaction e.g. allergic reaction or seizures even for very safe drugs
- ▶ Common practice to indemnify drug companies for routine immunisations (this is done in 24 countries)



# UK Indemnity Scheme

- ▶ diphtheria
- ▶ haemophilus influenzae type B (HIB)
- ▶ human papillomavirus
- ▶ influenza, except for influenza caused by a pandemic influenza virus
- ▶ measles
- ▶ meningococcal group B (meningitis B)
- ▶ meningococcal group C (meningitis C)
- ▶ meningococcal group W (meningitis W)
- ▶ mumps
- ▶ pandemic influenza A (H1N1) 2009 (swine flu) - up to 31 August 2010
- ▶ pertussis (whooping cough)
- ▶ pneumococcal infection
- ▶ poliomyelitis
- ▶ rotavirus
- ▶ rubella (German measles)
- ▶ smallpox - up to 1 August 1971
- ▶ tetanus
- ▶ tuberculosis (TB)

# Answers to Social Media vaccine myths

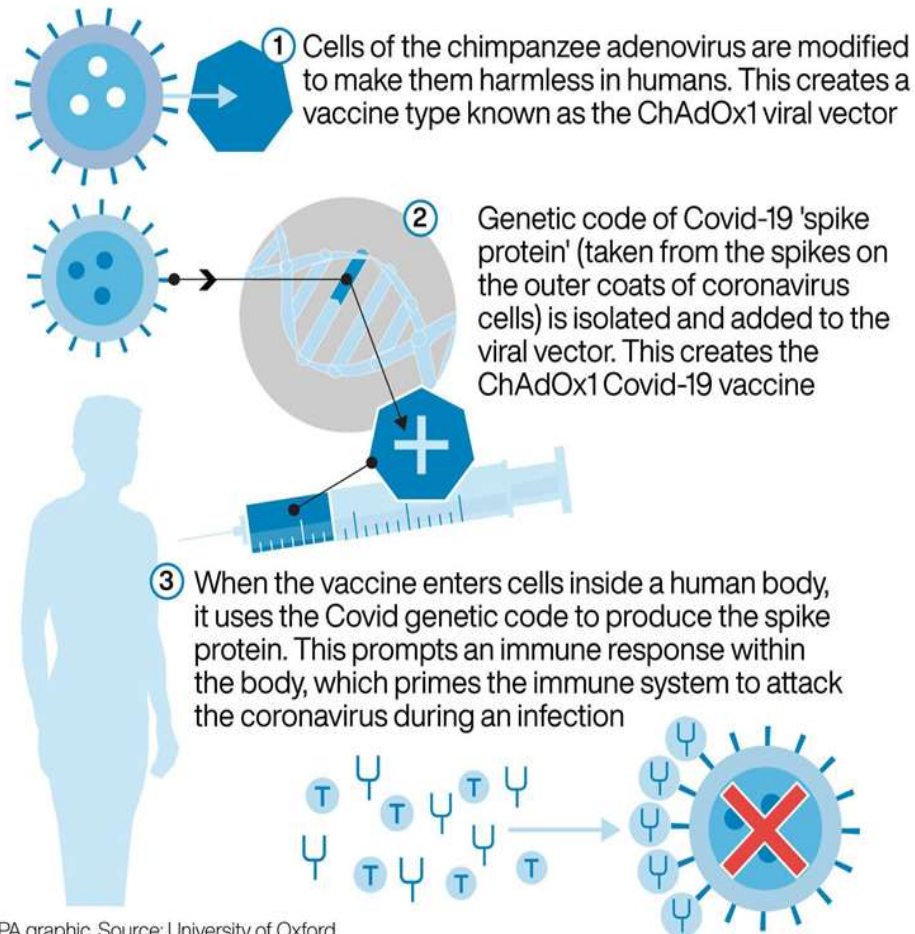
- ▶ Cannot give you Covid-19
- ▶ Cannot affect your DNA
- ▶ Does not affect fertility
- ▶ Is advised even if you have already had Covid-19
- ▶ Does not contain foetal cells or animal cells
- ▶ No alcohol in the Pfizer vaccine

# 4. Oxford vaccine

- ▶ Altered adenovirus carrier (common cold)
- ▶ The adenovirus cannot self-replicate
- ▶ Genetic code of the spike protein only is added
- ▶ Causes an immune response in our bodies to prevent future coronavirus infection
  
- ▶ 11,600 in Phase 3 trials (Oxford University)
- ▶ Efficacy 70% (90%/62%) – (Flu vaccine typically 40-50%)
- ▶ Now over 20,000 trial subjects
- ▶ The overall reported rates of serious adverse events were 0.7% in the vaccine group and 0.8% in the control group. (Lancet)
  
- ▶ Normal fridge temperatures
- ▶ Being sold at cost to low income countries (UK £3 per dose)

# Oxford vaccine

## How the Oxford Covid-19 vaccine works



PA graphic. Source: University of Oxford

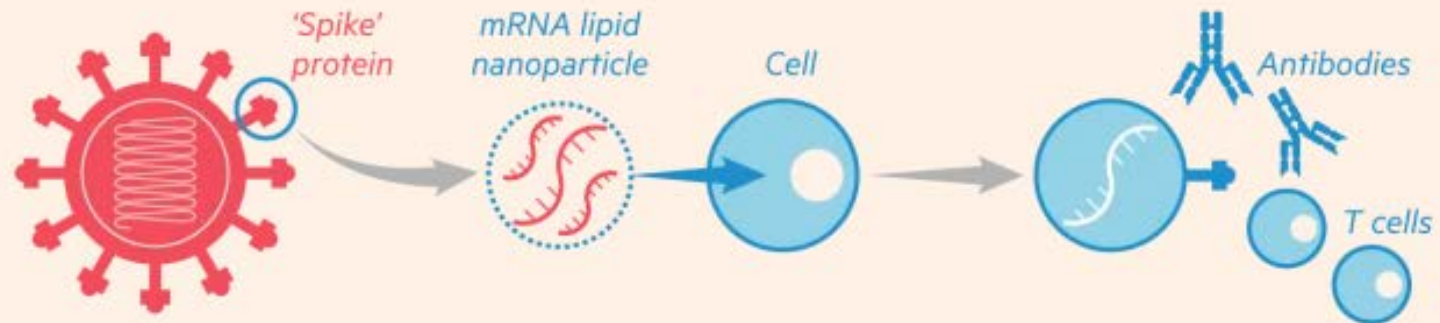
# Pfizer vaccine

- ▶ mRNA
- ▶ Genetic information that enters our cells with a blueprint that causes production of the spike protein
- ▶ No live or weakened virus
- ▶ Cannot alter our own genetic code
  
- ▶ 44,000 participants in phase 3 trials
- ▶ 95% effective (94% in >65s)
  
- ▶ Requires storage at -70°C
- ▶ More expensive than Oxford vaccine (£15 per dose)

# Pfizer vaccine

## How the Pfizer-BioNTech vaccine works

mRNA vaccines give the immune system genetic instructions to recognise the virus



Scientists focus on the genetic sequence for the virus's 'spike' protein. This is used to synthesise an mRNA sequence – instructions that cells can use to make the 'spike' protein

The synthetic mRNA is packaged in a lipid nanoparticle that delivers the instructions to a cell

Once inside the cell, its cellular machinery follows the mRNA instructions to produce the viral protein. This is displayed on the surface of the cell and stimulates an immune system response

Source: Pfizer  
© FT

# 5. Biblical principles

- ▶ God's care for human life from conception - Psalm 139
- ▶ Example of Jesus healing many people
- ▶ God's care for the vulnerable - Isaiah 1:17
- ▶ God's command for us to act justly - Micah 6:8
- ▶ Command to love our neighbour as ourselves - Mark 12:31 and
- ▶ Think of the interests of others - Philippians 2:4

# 6. Ethical Considerations

- ▶ Use of immortal cell lines taken from an aborted child
- ▶ Cooperation with evil
- ▶ Justice and equity
- ▶ Loving my neighbour



# Immortal cell lines

- ▶ HEK-293 (kidney cells)
- ▶ Aborted baby in 1973
- ▶ Cells have been altered to become 'immortal'
  
- ▶ Used at some stages in all 3 currently available vaccines (and many other treatments, e.g. MMR and other vaccines, cancer treatments ... and also artificial sweeteners(!))
- ▶ Oxford – used in development/production of the vaccine
- ▶ mRNA – used in testing stage – less involvement

# Immortal cell lines

- ▶ There are no foetal cells in any of the vaccines
- ▶ No further abortions have been carried out to produce the vaccines

# Ethical questions – ‘cooperation with evil’

- ▶ We live in a fallen world
- ▶ Distant or close cooperation?
- ▶ Active or passive?
- ▶ Does it perpetuate/encourage evil?
- ▶ What is the motivation?
- ▶ Is there an ethical (more ethical) alternative?
- ▶ Will we have a choice of vaccine?

# Vaccines and the Christian Worldview: Principles for Christian Thinking in the Context of COVID.

Albert Mohler

- ▶ The vaccine's structure relied upon the cell line of HEK-293, which originated with an aborted foetus. This is a tragedy of history. **A horrifying wrong was done - but that does not mean that good cannot come from that harm**, even as it is a good tainted by the realities of a sinful world. This idea is expressed, for Christians, as **the doctrine of double effect**. Some actions have more than one effect. For Christians, the primary intention must aim at virtue and good. The intention behind an act must never seek harm or evil or any moral reality and outcome against God's will. We must never be complicit in intending sin, and certainly this applies to every dimension of abortion. But the Christian also acknowledges a potential double effect, for every moral act can lead to consequences not intended, but unavoidable. If the abortion of even a single human baby was required for this vaccine, or if abortion-derived materials were included in the vaccine, Christians would be rightly outraged. This is not the case. **The vaccine can be taken by pro-life Christians with legitimacy.**

# Justice and Equity

- ▶ Consequences for the most vulnerable?
- ▶ Who should receive it first?
- ▶ Cost and storage requirements have implications for low income countries
- ▶ The West are buying vaccines to the detriment of the rest of the World

# Loving my neighbour

- ▶ Impact of Covid 19 on the most vulnerable
- ▶ Benefits of vaccination to the individual and wider society
- ▶ Not everyone can have a vaccine, but the more people that have it the more others are protected
- ▶ Herd immunity for measles requires approx. 95% vaccination

# Conclusions

- ▶ We are living in an era of fake news, be careful where you get information from
- ▶ Covid 19 is a serious illness
- ▶ The vaccines are safe and effective
- ▶ Ethical dimension to decisions about the vaccine, imperative to 'love my neighbour' and care for the vulnerable and concerns about the foetal origin of the cell lines used in the vaccine
- ▶ This is an area that Christians may disagree on, but Christians can accept the vaccine with gratitude to God and a clear conscience

# 7. Resources

- ▶ Data about cases and deaths

- ▶ <https://www.arcgis.com/apps/opsdashboard/index.html#/bda7594740fd40299423467b48e9ecf6>

- ▶ Christian Medical Fellowship Resources

- ▶ <https://www.cmf.org.uk/resources/covid-19-resources/>

- ▶ <https://www.eauk.org/resources/what-we-offer/videos-and-podcasts/making-ethical-decisions-webinar>

- ▶ Details of individual vaccines

- ▶ <https://s27589.pcdn.co/wp-content/uploads/2020/12/COVID-19-Vaccine-Candidates-and-Abortion-Derived-Cell-Lines.pdf>

- ▶ Albert Mohler (from Libby Powell)

- ▶ <https://albertmohler.com/2020/12/14/vaccines-and-the-christian-worldview-principles-for-christian-thinking-in-the-context-of-covid>

- ▶ Christian Premier Radio (2<sup>nd</sup> December 2020)

- ▶ <https://www.premierchristianradio.com/Shows/Weekday/Inspirational-Breakfast/Interviews/Is-the-Coronavirus-vaccine-the-light-at-the-end-of-the-tunnel>



# Questions

- ▶ Questions?