

# COVID-19 longevity scenarios: *a bump in the road or a catalyst for change?*

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# COVID-19 longevity scenarios: *a bump in the road or a catalyst for change?*



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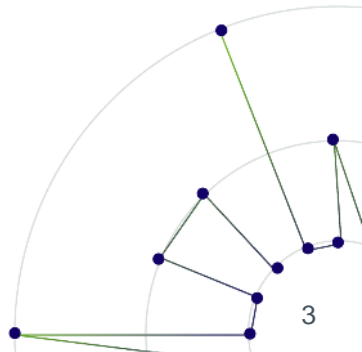


Erik Pickett  
**Panelist**

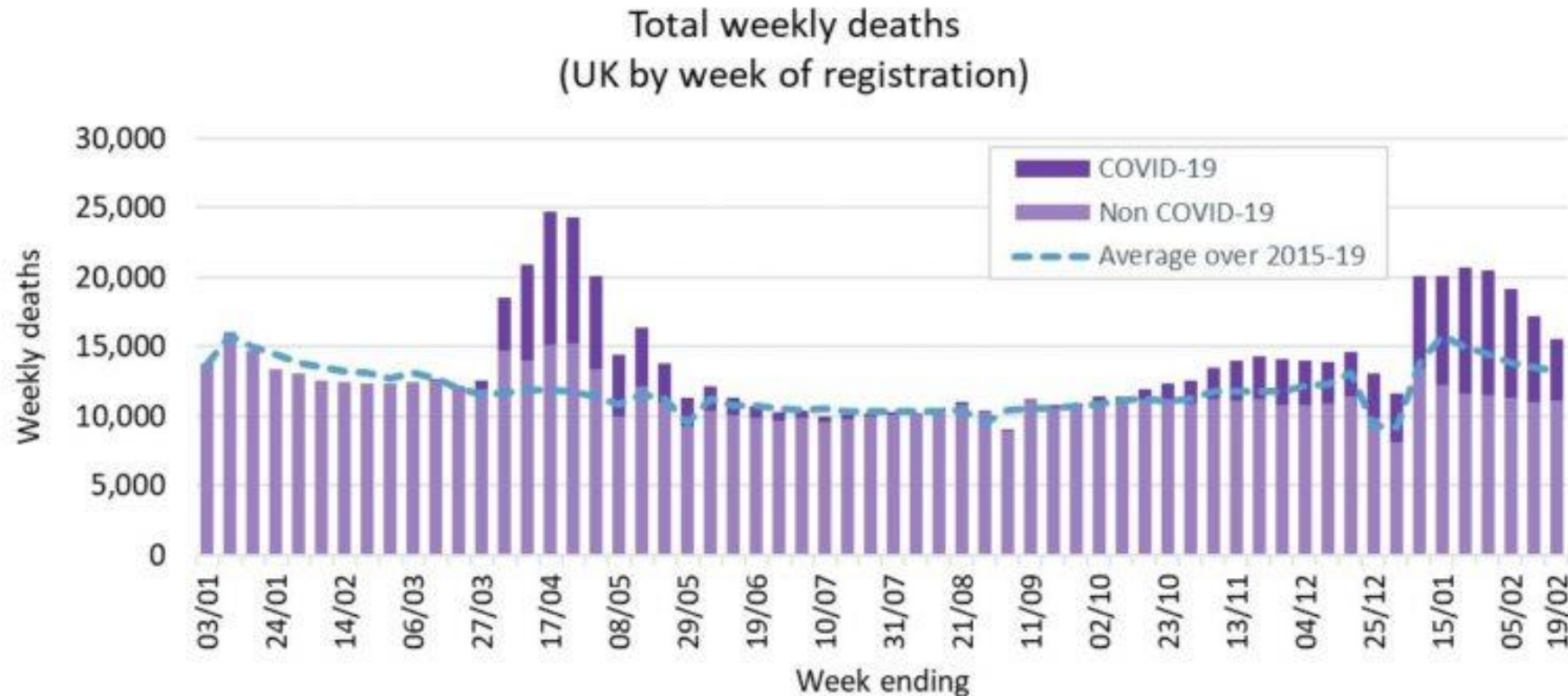
Actuary and  
Chief Content Officer,  
Club Vita

# Agenda

1. Introduction
2. Current state of the pandemic: vaccines and variants
3. Scenario modelling for COVID-19
4. A Trustee's view: risk management for pension schemes



# The pandemic so far...

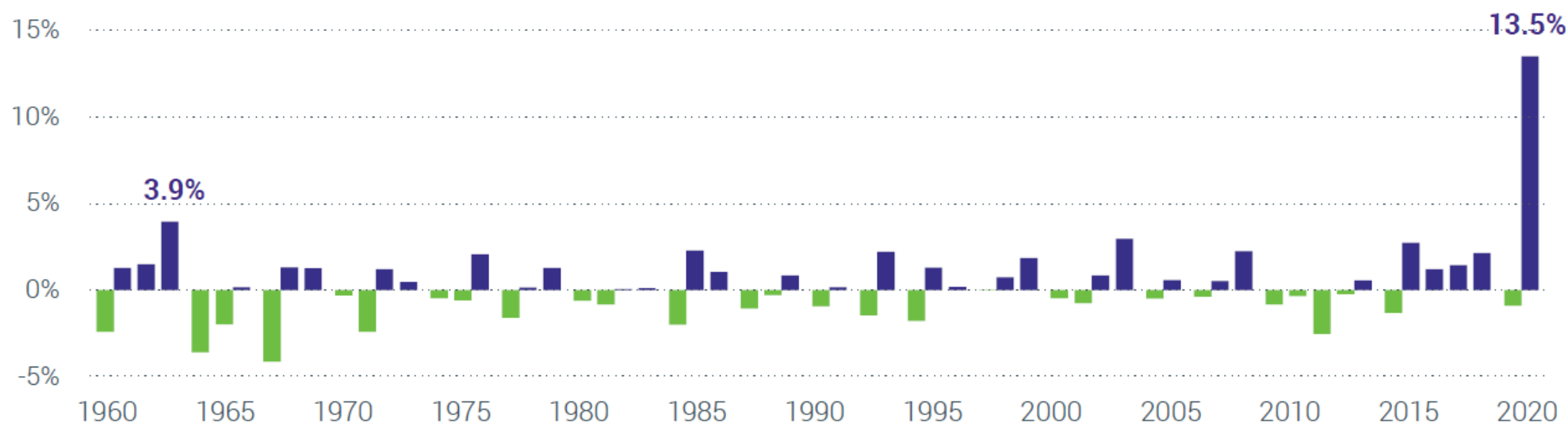


Weekly figures for Scotland use a different definition of weeks, running from Monday to Sunday rather than Saturday to Friday. The chart above is based on using the Scottish data for the week ending on the Sunday immediately after the date shown on the horizontal axis.

c80k / c14% more deaths than expected in 2020

# Historical context of 2020 experience

ENGLAND & WALES: EXCESS DEATHS VERSUS UNDERLYING TREND



Source of data: own calculations based on data from the Human Mortality Database, ONS and Public Health England

In isolation, 2020 excess deaths will not significantly affect pension fund liabilities

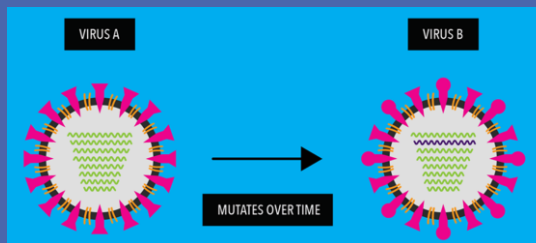


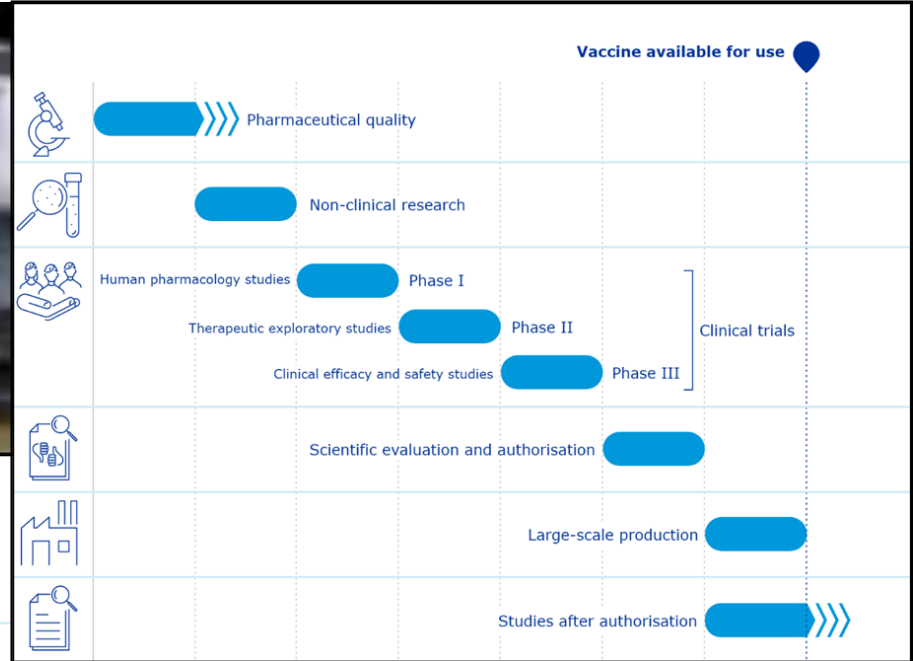
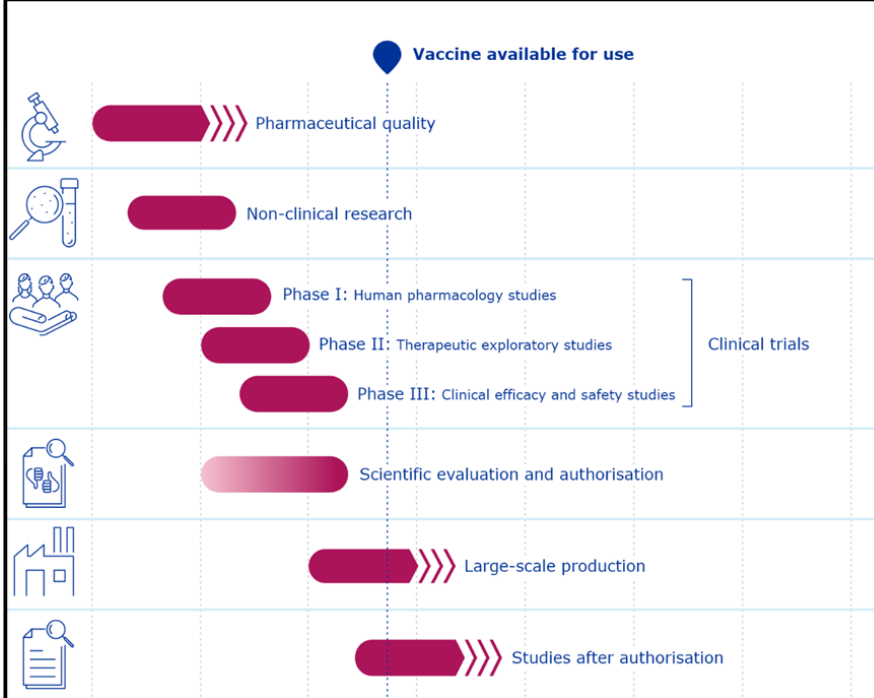
# Vaccines and variants

# Vaccines

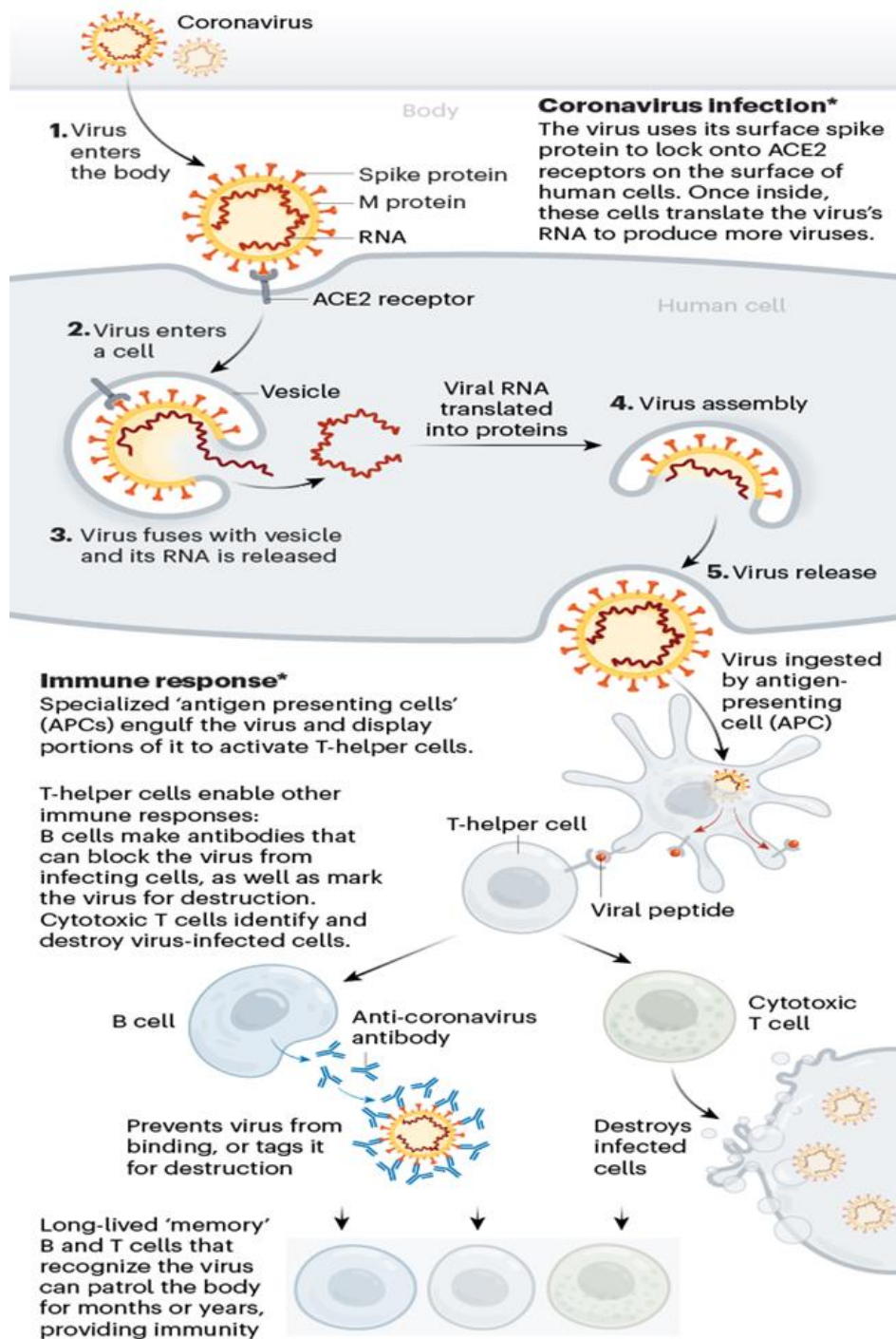


# Variants

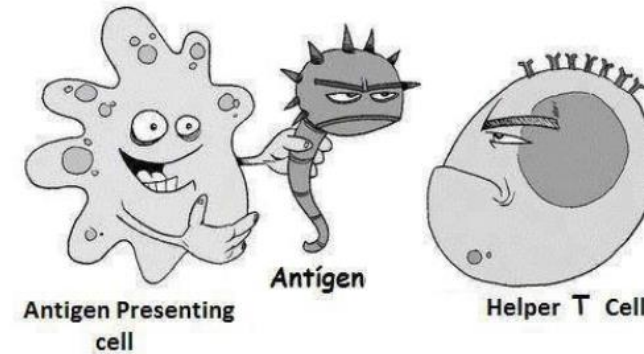




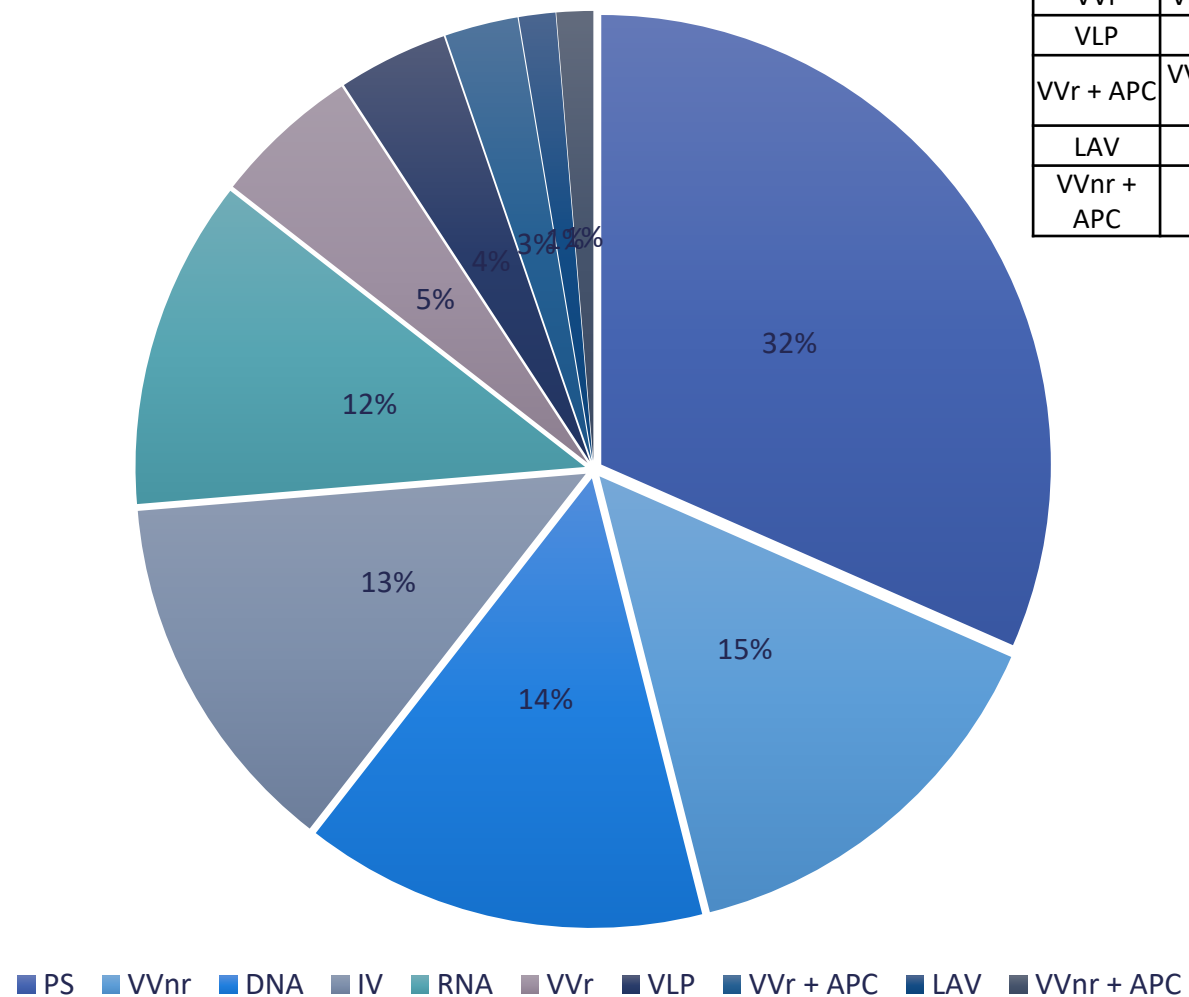




# How vaccines work



**“Look and remember now go fetch!!”**



Platform		Candidate vaccines (no. and %)	
PS	Protein subunit	24	32%
VVnr	Viral Vector (non-replicating)	11	14%
DNA	DNA	11	14%
IV	Inactivated Virus	10	13%
RNA	RNA	9	12%
VVr	Viral Vector (replicating)	4	5%
VLP	Virus Like Particle	3	4%
VVr + APC	VVr + Antigen Presenting Cell	2	3%
LAV	Live Attenuated Virus	1	1%
VVnr + APC	VVnr + Antigen Presenting Cell	1	1%

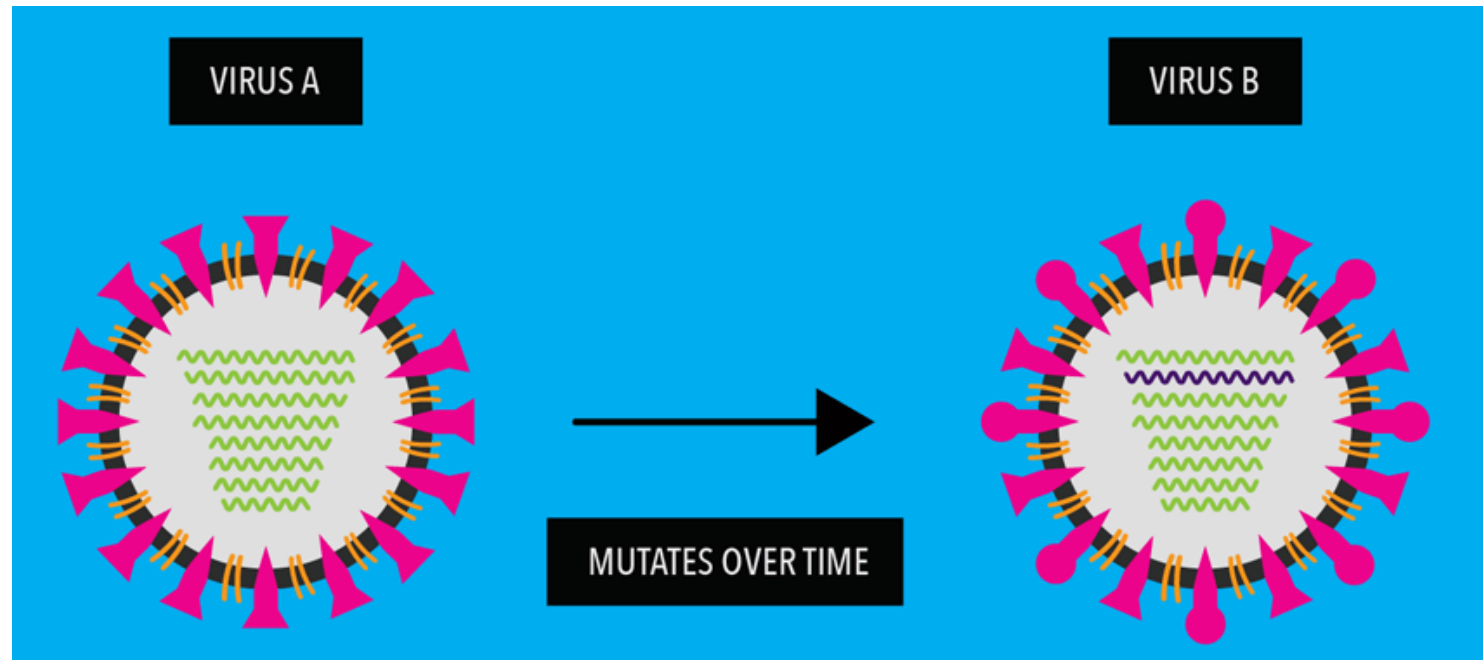
Developer	Type
Pfizer/BioNTech	mRNA-based vaccine
Moderna	mRNA-based vaccine
Sinovac	Inactivated
Sinopharm x 2	Inactivated
Bharat	Inactivated
Chumakov	Inactivated
AstraZeneca/Oxford	Viral vector
Gamaleya	Viral vector
CanSino	Viral vector
Janssen	Viral vector
Federal Budgetary Research Institution State Research Centre, Russia	Peptide/protein subunit

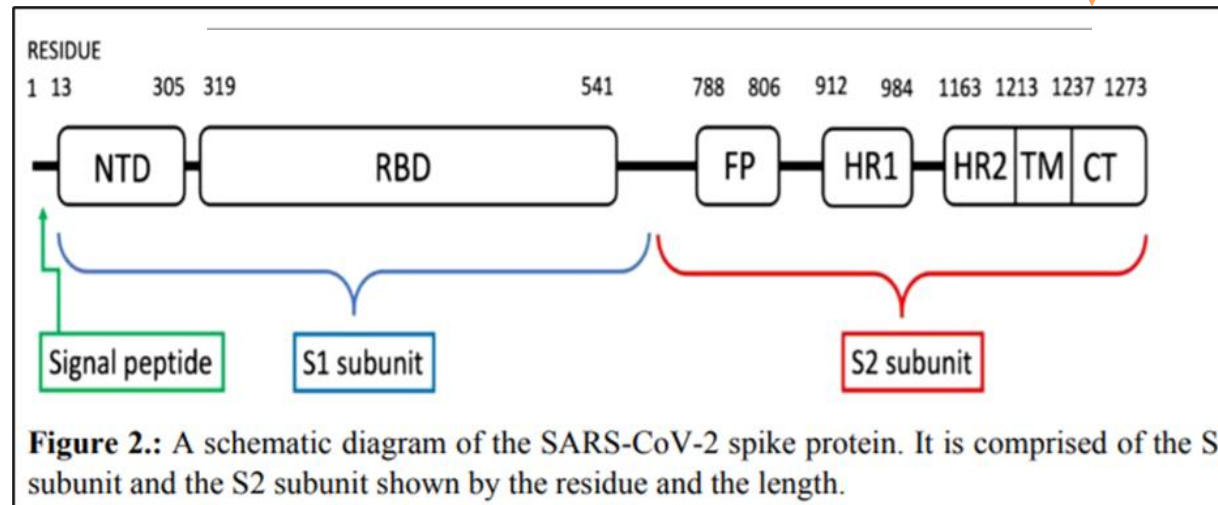
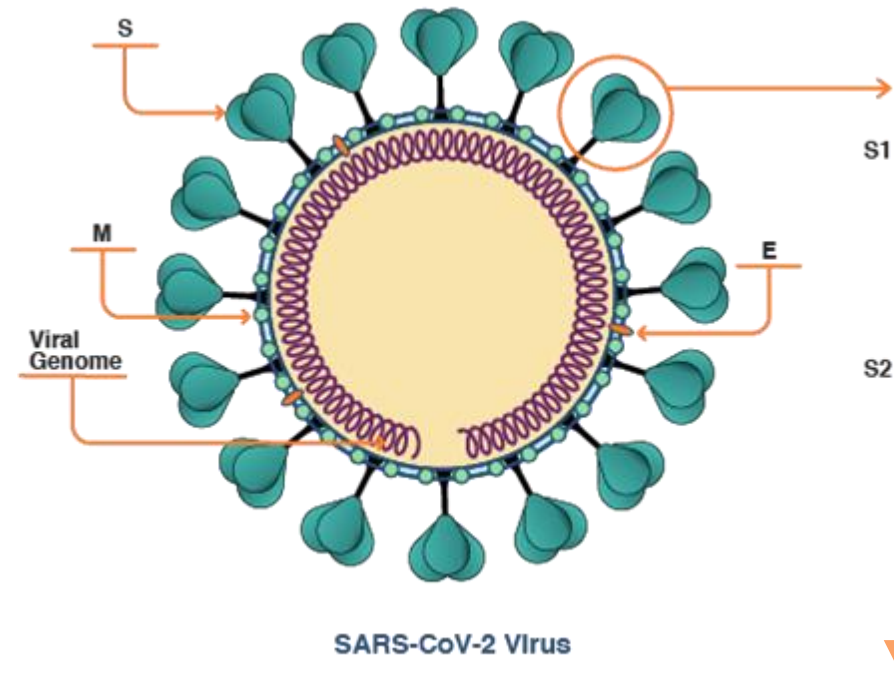




Real world evidence?







UK

B.1.1.7

Brazil

P.1.

South  
Africa

B.1.351

?



moderna



AstraZeneca

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Summary

Regular (annual?) COVID  
vaccine

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Tweaked as necessary to  
cope with new variants

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Less challenging than the  
flu vaccine programme

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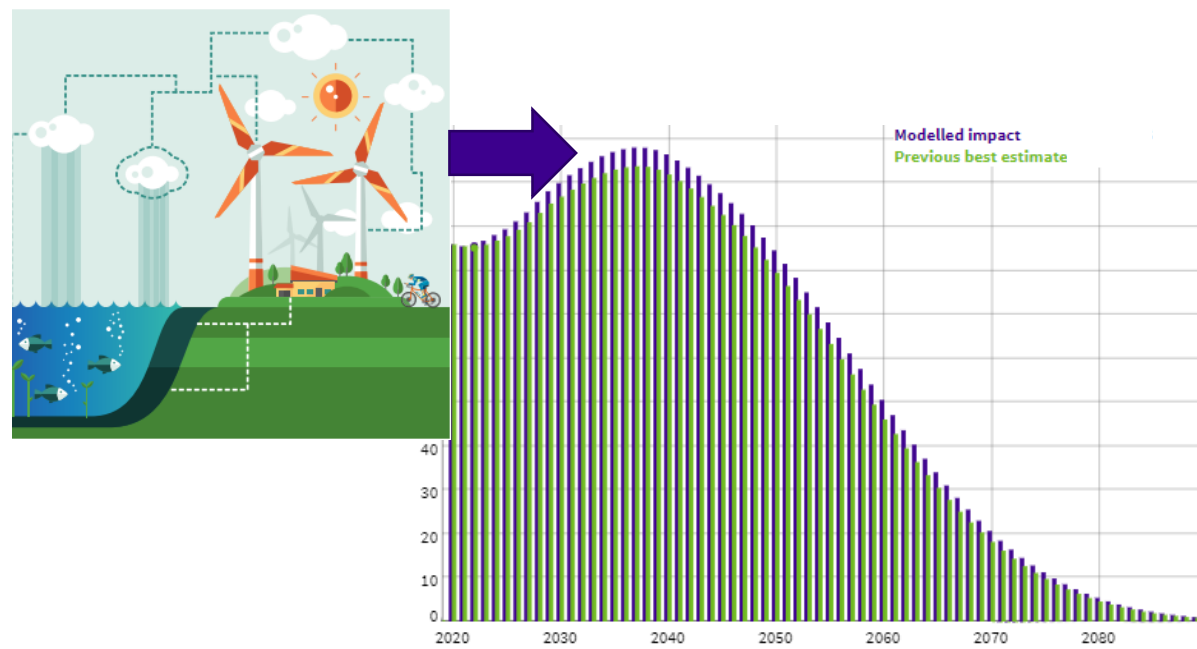
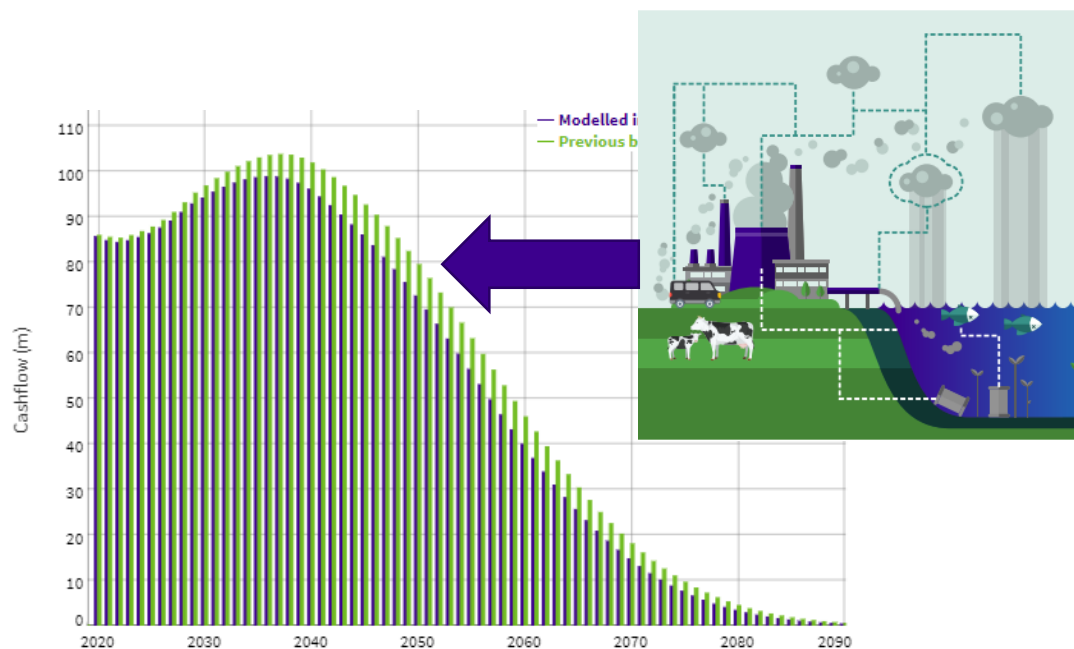
# Longevity scenario modelling



# Introduction to scenario modelling

## Scenario modelling

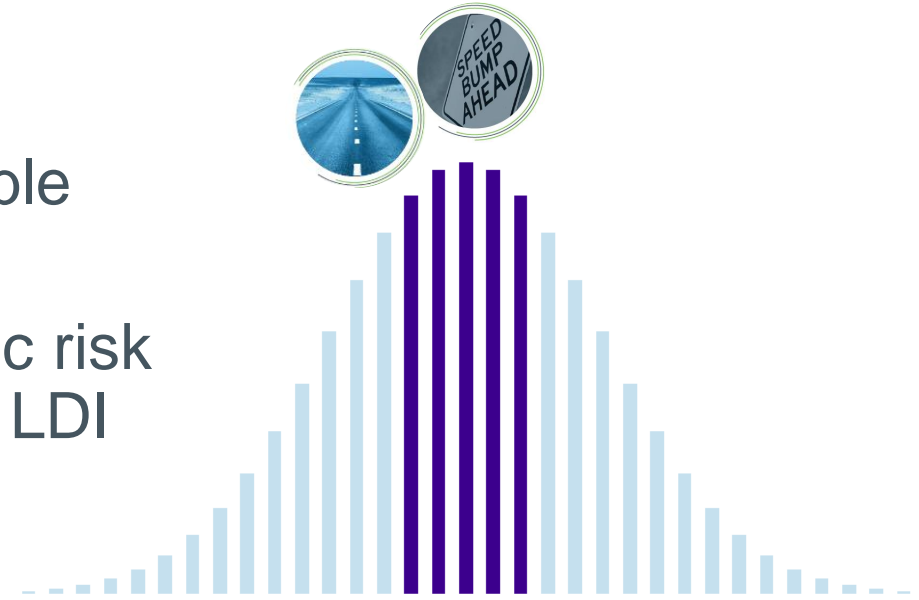
*The process of assessing the effects of specific scenarios on a pension fund's future financial position.*



# Uses of scenario modelling

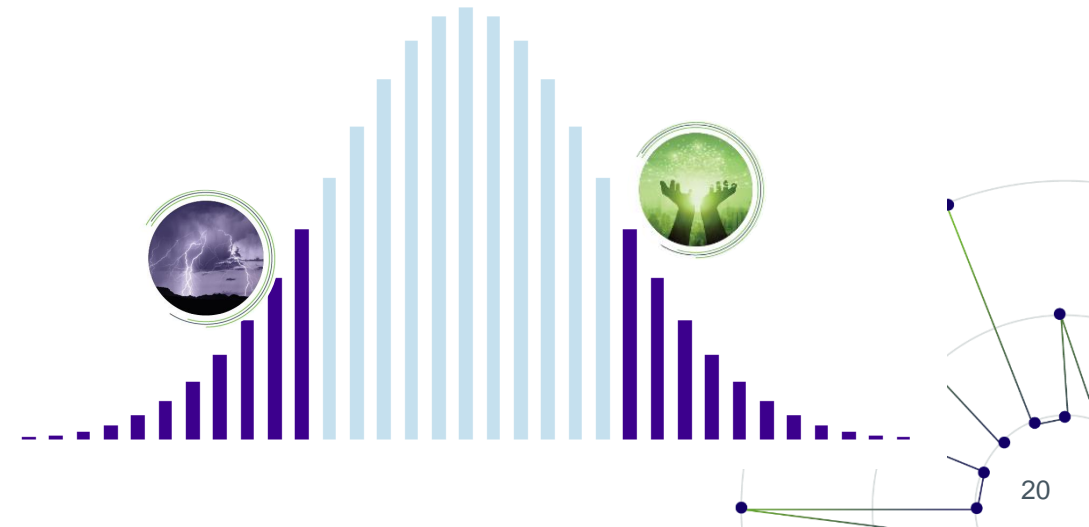
**Middle ground** – understand range of reasonable best estimates

- Understand frictional costs of demographic risk on funding and investment strategies and LDI portfolios

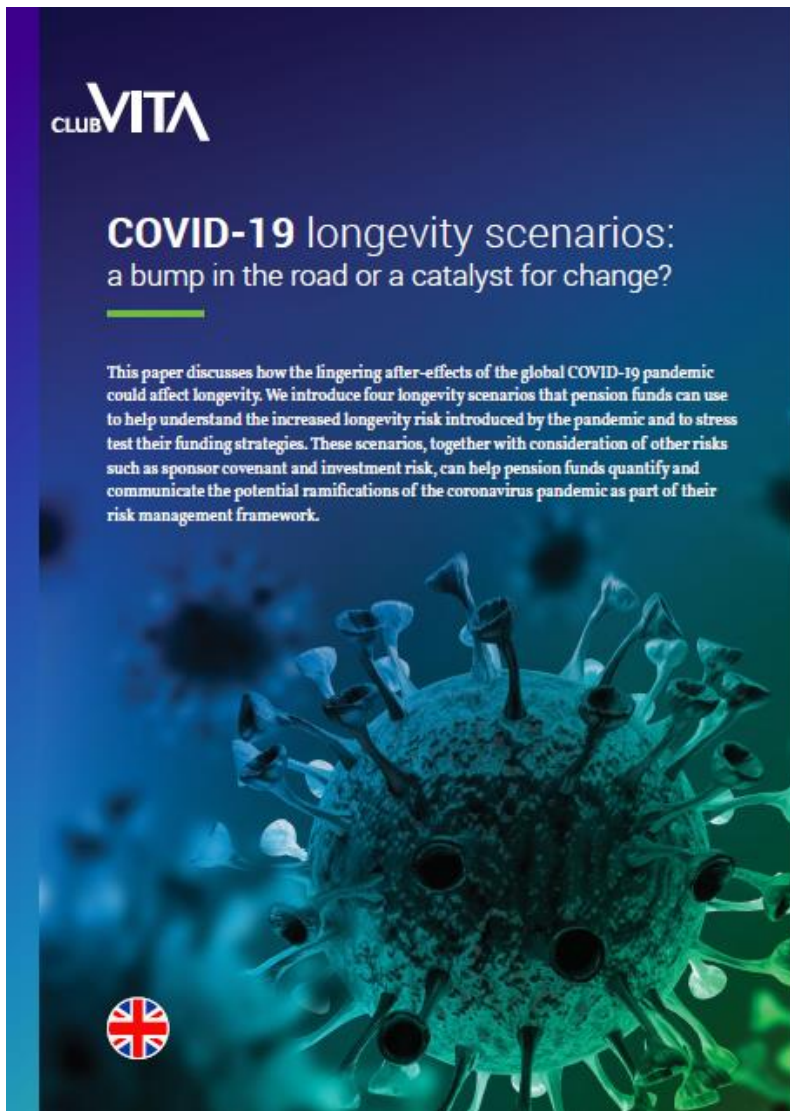


**Extreme events** – understand effects of tail events

- Identify unmanaged risk and possible mitigation strategies
- Test resilience of funding and investment decisions



# Club Vita research paper



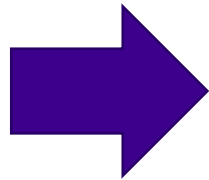
Research paper and accompanying technical appendices

- UK: <https://www.clubvita.co.uk/collaborative-research/covid-19-longevity-scenarios-a-bump-in-the-road-or-a-catalyst-for-change>
- US: <https://www.clubvita.us/collaborative-research/covid-19-longevity-scenarios-a-bump-in-the-road-or-a-catalyst-for-change>
- Canada: <https://clubvita.ca/Collaboration/Scenarios>

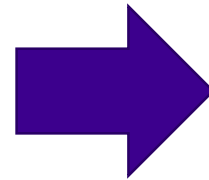
# Calibration process



Define scenarios

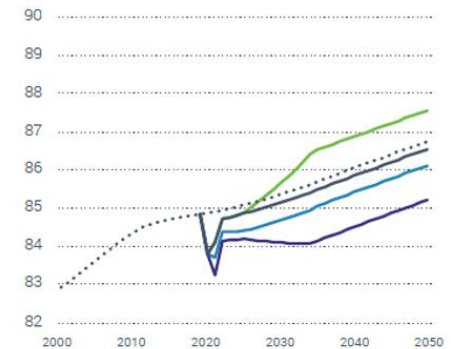
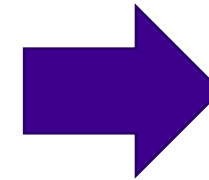


Distil available  
research on specific  
/ similar events



Key mortality drivers	
	Direct short-term risk of COVID-19
	Disruption to non-COVID medical care
	Changes to health and care systems
	Global Recession

Determine effects of  
specific events on key  
longevity drivers



Calibrate  
scenarios

# Club Vita's COVID longevity scenarios



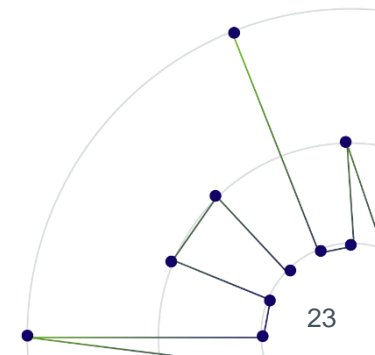
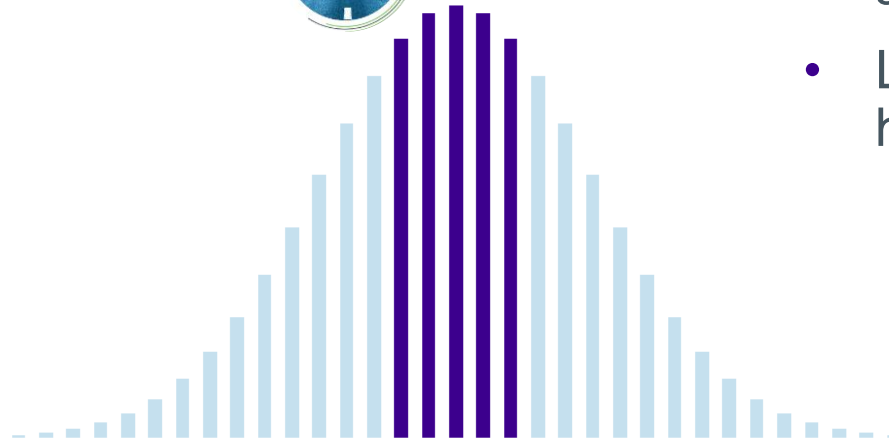
## Bump in the Road

- Effective roll out of vaccine results in a swift recovery from the pandemic
- Marked increase in deaths in 2020 and 2021
- Then largely return to pre-pandemic trajectory
- ...but with a couple of “lost-years” of improvements



## Long Road to Recovery

- Challenges to efficacy and take up of the vaccine result in prolonged effect of the pandemic.
- COVID related excess mortality continues through first half of 2020s
- Longer term disruption to non-COVID medical services: low levels of improvements in 2020s and 2030s
- Lower socioeconomic groups hardest hit





# Club Vita's COVID longevity scenarios



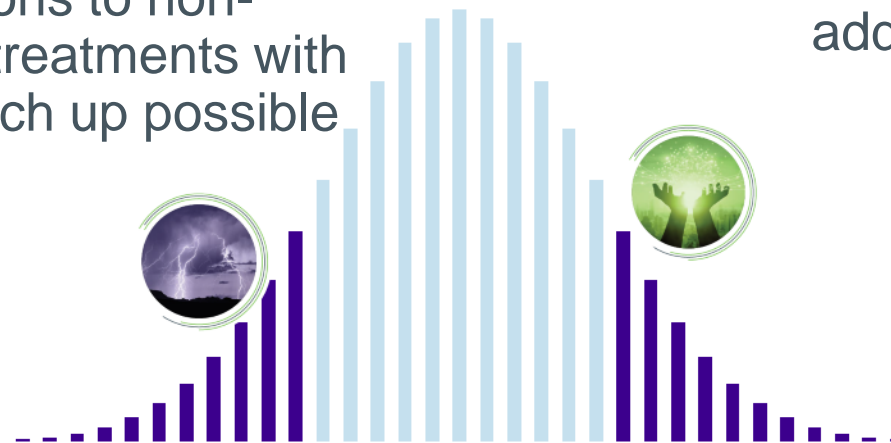
## Healthcare Decline

- Initial optimism around the vaccine proves unfounded – adverse publicity limits uptake and new mutations limit effectiveness
- Persistent waves of COVID-19 mortality through 2020s
- NHS overwhelmed by each wave
- Massive disruptions to non-COVID medical treatments with no periods of catch up possible

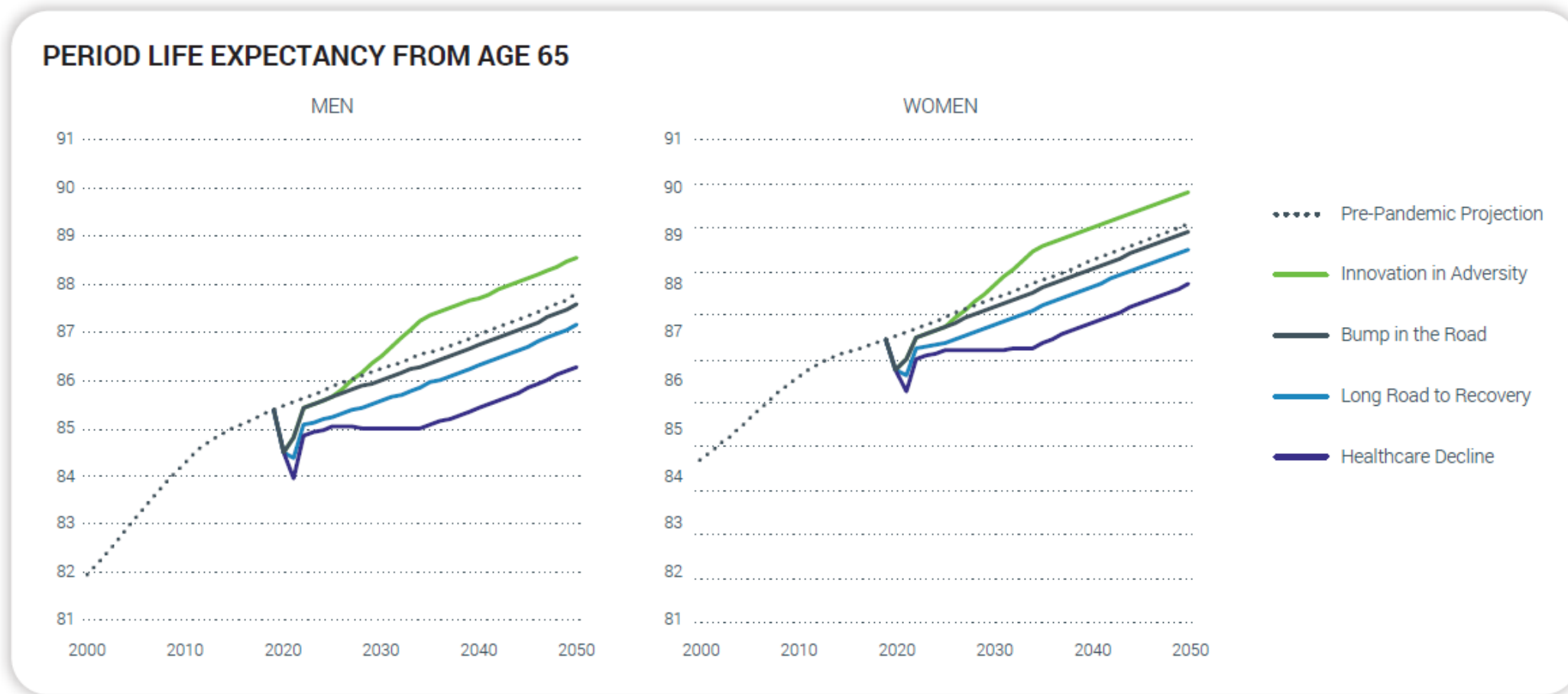


## Innovation in Adversity

- Effective roll out of vaccine results in a swift recovery from the pandemic
- 'V-shaped' economic recovery allowing catch-up in lost years of improvements
- Lessons learned act as catalyst for longer term improvements – directly from medical advances and indirectly from efforts to address health inequality



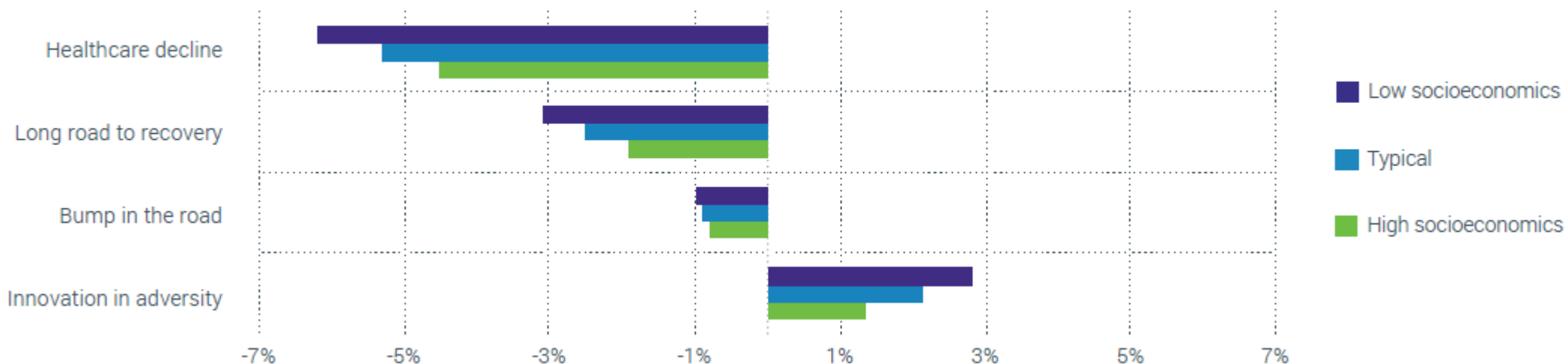
# Comparison of scenarios



Period life expectancy will only stay low if 2020/21 experience persists

# Comparison of scenarios

## LIABILITY IMPACTS



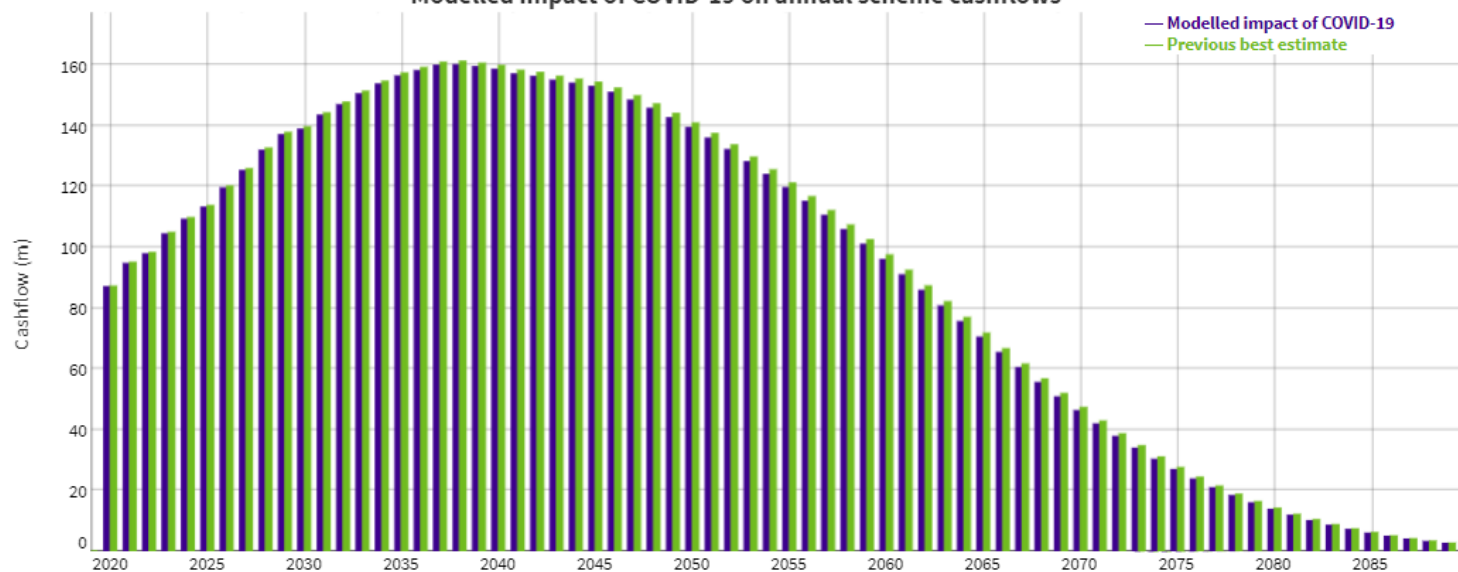
Liabilities will also be affected by changes to other demographics and financial conditions / outlook

# Calibration of scenarios



## Bump in the road

Modelled impact of COVID-19 on annual scheme cashflows



**-0.87%**

CHANGE IN PRESENT VALUE

**-0.06 yrs**

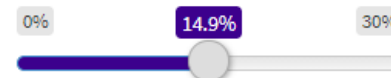
CHANGE IN DURATION

**-0.24 / -0.22 yrs**

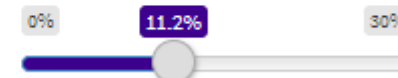
CHANGE IN AVERAGE LIFE EXPECTANCY

## Immediate impact of COVID-19\*

Year 0 (2020)



Year 1 (2021)



## Longer term impact\*

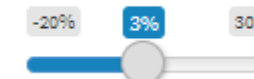
Initial



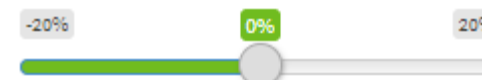
Intermediate



Ultimate



## Socioeconomic differences\*



\*calibration has been simplified for ease of presentation

# Dynamic scenario modeling

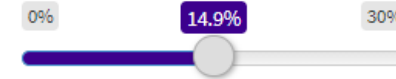
Larger impact in 2021?

Higher long term impact?

Reduced long term impact on higher socioeconomic groups?

## Immediate impact of COVID-19\*

Year 0 (2020)



Year 1 (2021)



## Longer term impact\*

Initial



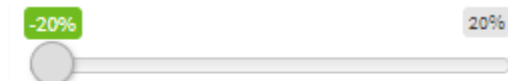
Intermediate



Ultimate



## Socioeconomic differences\*

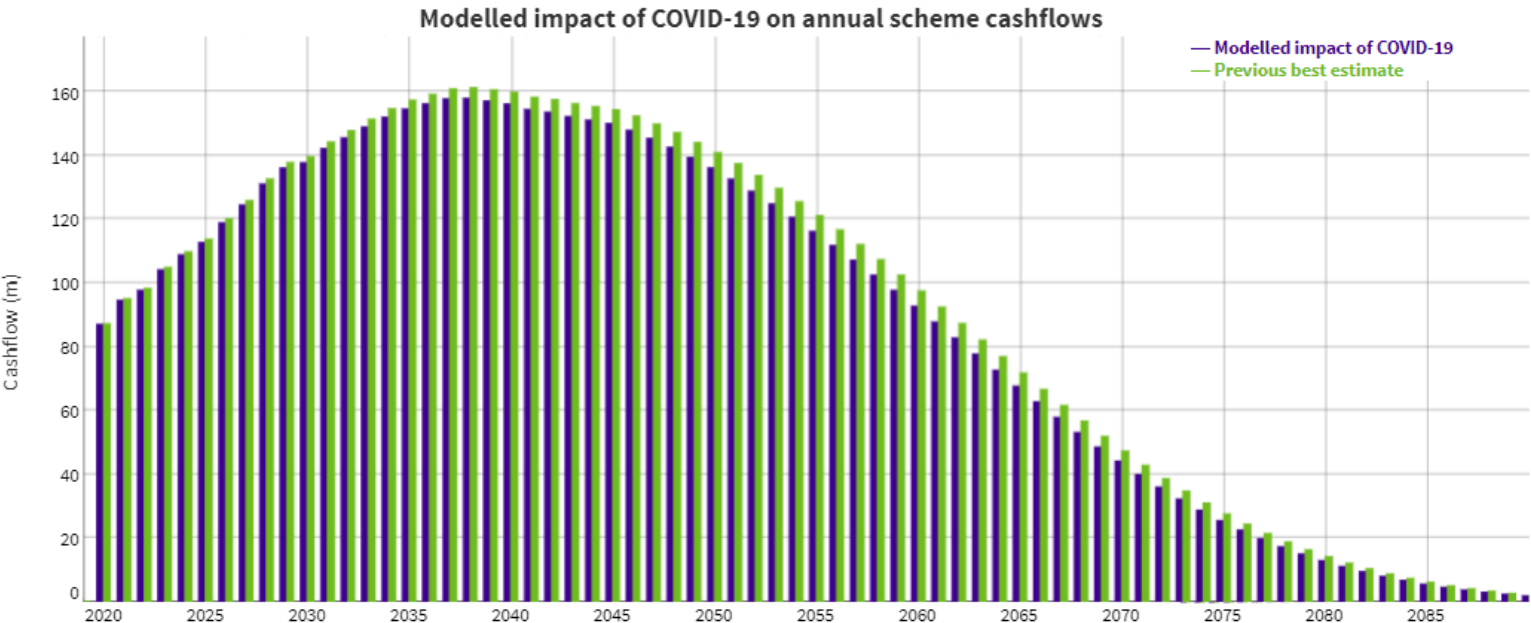


\*calibration has been simplified for ease of presentation



# Dynamic scenario modelling

## Bespoke scenario



**-2.5%**

CHANGE IN PRESENT VALUE

**-0.21 yrs**

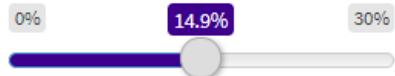
CHANGE IN DURATION

**-0.62 / -0.59 yrs**

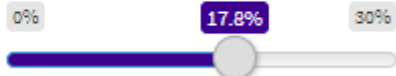
CHANGE IN AVERAGE LIFE EXPECTANCY

### Immediate impact of COVID-19\*

Year 0 (2020)



Year 1 (2021)



### Longer term impact\*

Initial



Intermediate



Ultimate



### Socioeconomic differences\*



\*calibration has been simplified for ease of presentation

# Risk Management for Pension Schemes

*A Trustee's view*

## A Trustee's view

Dalriada. A better way

- Covid – Everyone is interested
- Risk management
  - Integrated risk management
- What can we actually do

# Questions?



Mark Sharkey  
**Webinar chair**

Head of Client Delivery,  
Club Vita



Vassos Vassou  
**Panelist**

Director,  
Dalriada Trustees Limited



Nicola Oliver  
**Panelist**

Director, Head of  
Longevity, Mortality and  
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Medical Intelligence



Erik Pickett  
**Panelist**

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# Thank you

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