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An ICAT Health and Care Helicopter Tour

James Cripps

Leonel Rodrigues Lopes Junior

John Ng

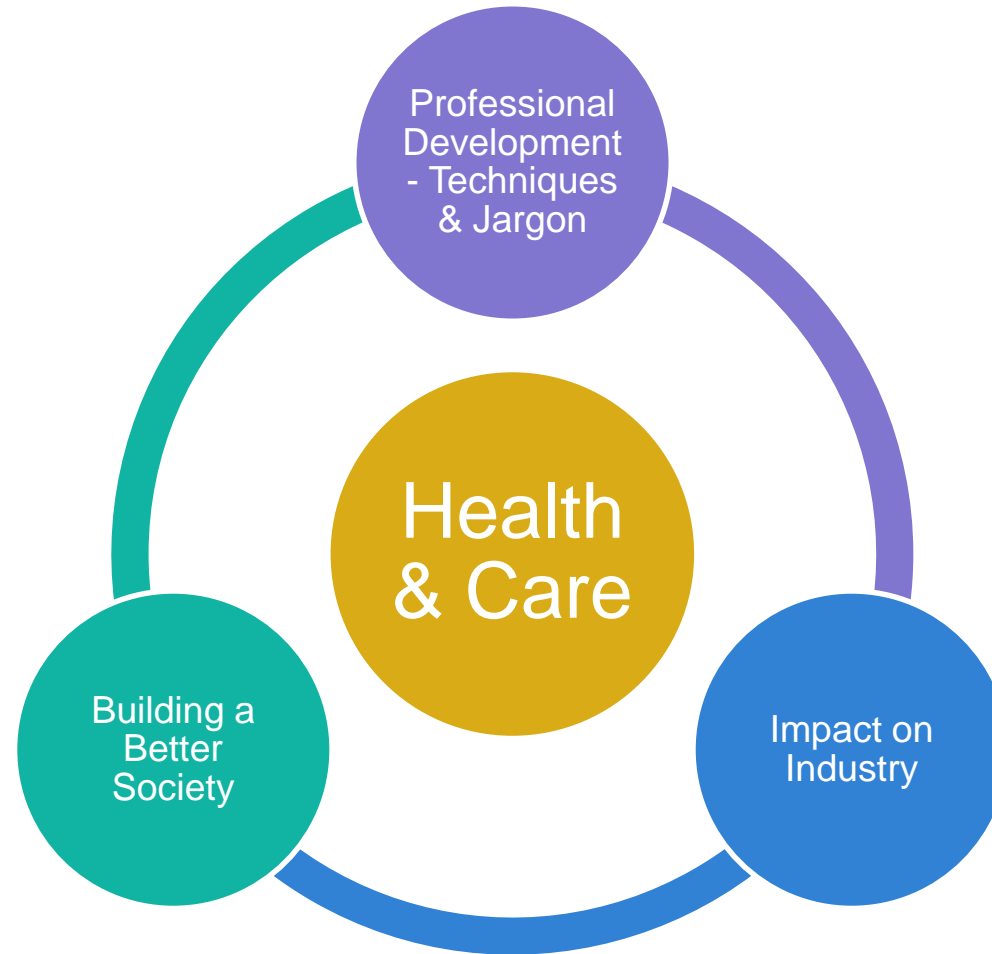
Richard Purcell

Scott Reid

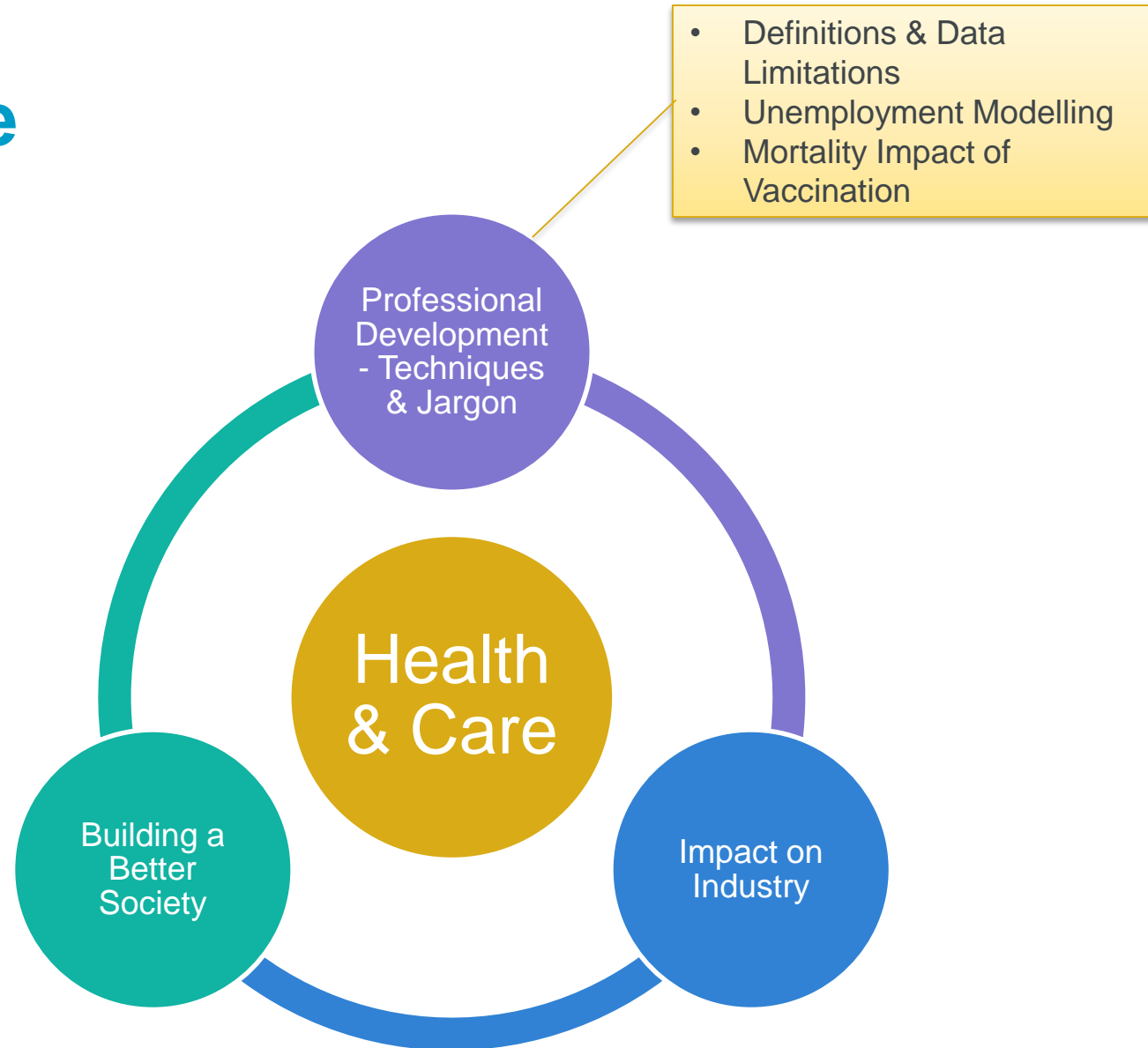
Chris Reynolds

Josephine Robertson

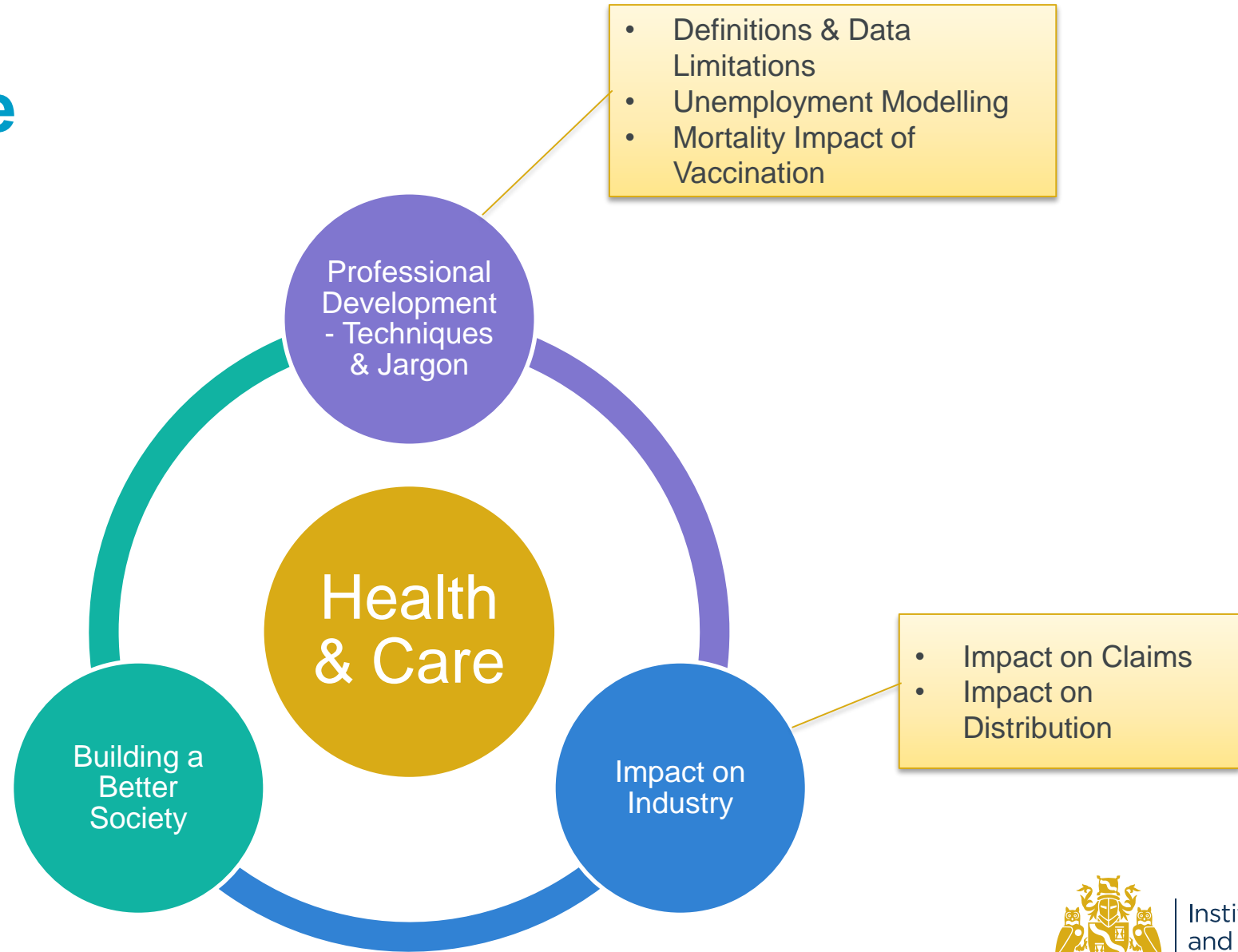
Health and Care



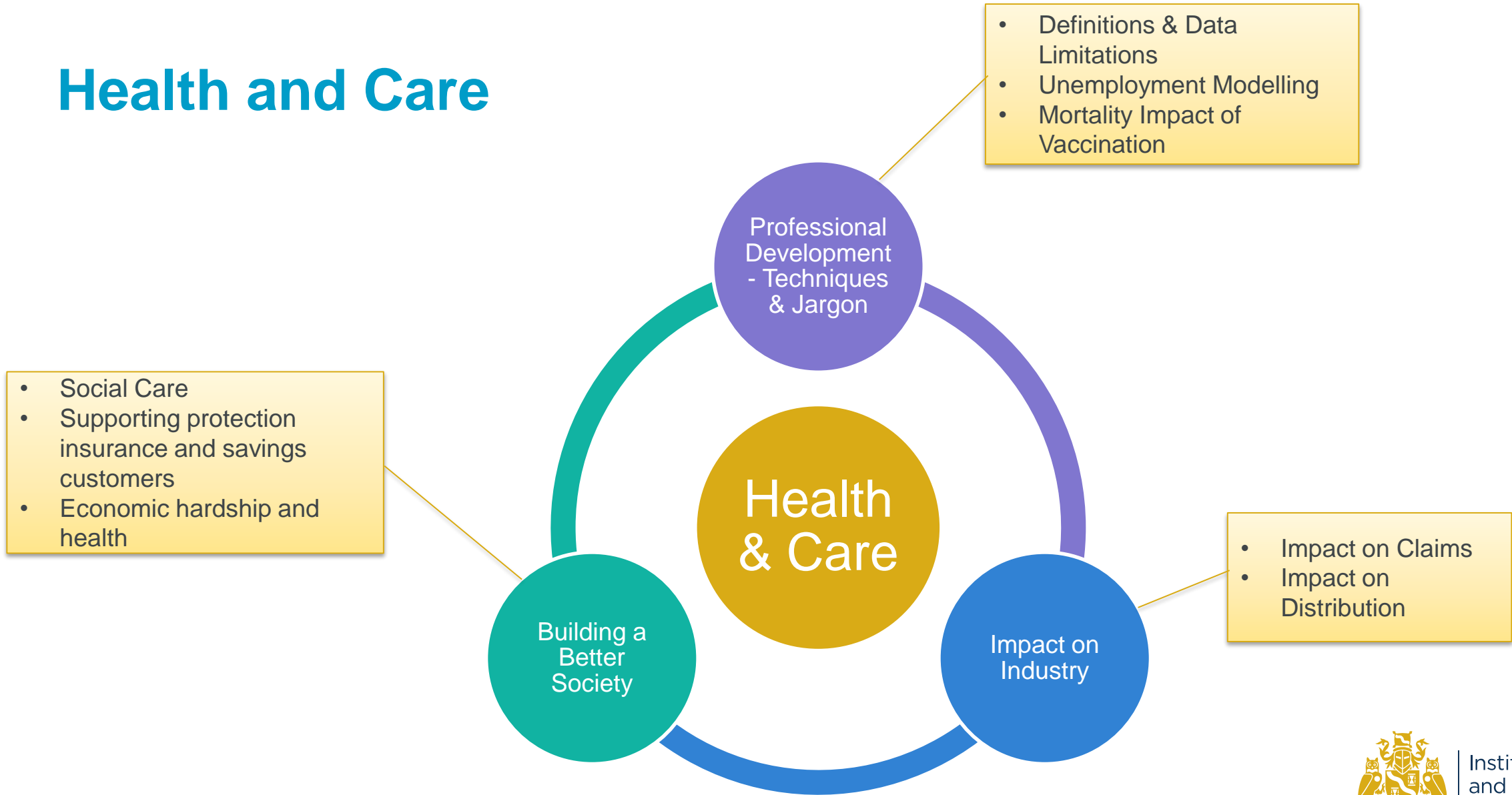
Health and Care



Health and Care



Health and Care





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Helicopter Tour

1) Statistics, Ratios and understanding limitations of data available

Leonel Rodrigues Lopes Junior

<https://www.actuaries.org.uk/practice-areas/foa-covid-19-action-taskforce-icat-workstreams/icat-workstreams-overseen-health-and-care-board>

This report aims to:

- Provide **definitions** to the most important and popular numbers/measures related to the spread and severity of COVID-19.
- Explain how the main epidemiologic **statistics and ratios** are calculated and highlight their limitations.
- Provide advice on how to check the **reliability of data, information and research** published.

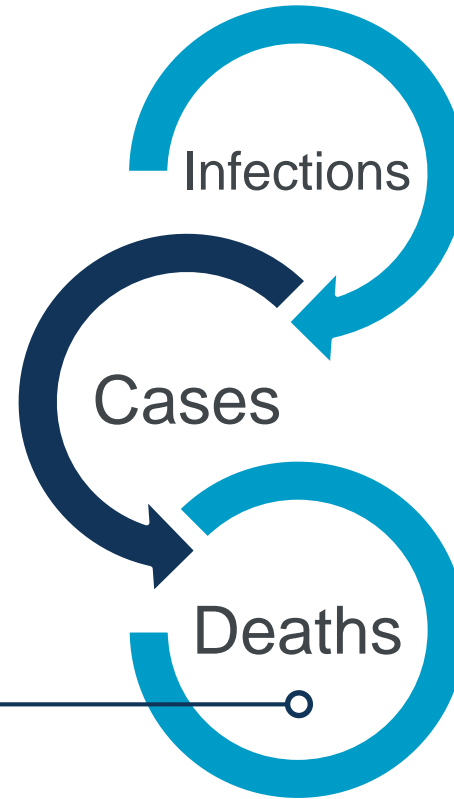


Main definitions

The count of people who have tested positive for the presence of the genetic material of the virus.

Excess deaths

Accounts for deaths (from all causes) above expected



The true number of people who are infected.

- Confirmed cases
- Asymptomatic cases
- Symptomatic not tested

The number of deaths from COVID-19 .

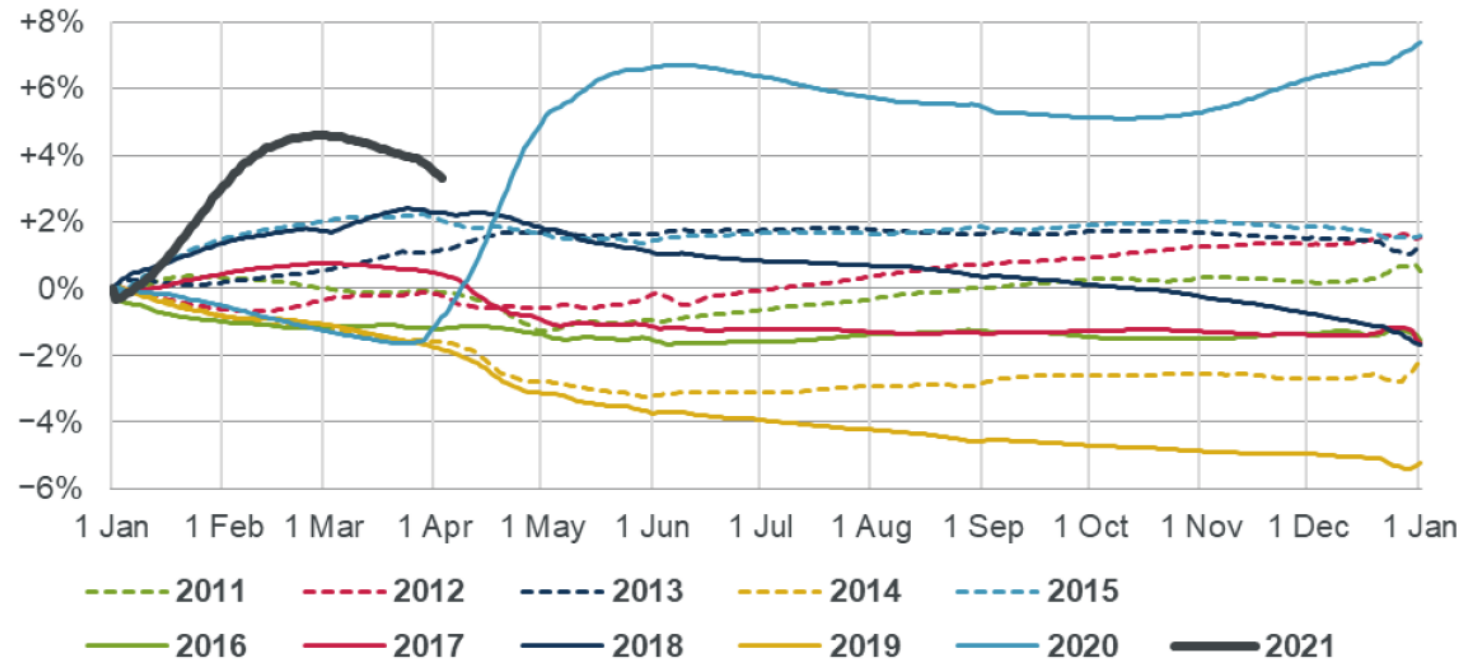
- Deaths from confirmed cases
- Posthumously tested
- suspected COVID-19 deaths



Excess deaths

England and Wales

Chart 2: Cumulative standardised mortality rate compared to the 2011-2020 average



Source: Mortality monitor – COVID-19 update – week 13 of 2021, Continuous Mortality Investigation, April 2021.



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Statistics and ratios (or rates)

Reproduction Number

R_0

The average number of infections generated from one infected individual before any response to the disease.

Case Fatality Rate

$$\frac{\text{Confirmed deaths}}{\text{Confirmed cases}}$$

Infection Fatality Rate

$$\frac{\text{COVID-19 deaths}}{\text{Infections}}$$

Attack Rate

$$\frac{\text{Cases}}{\text{Population at risk}}$$

Main limitations

- Different definitions
- Testing capability
- Estimated x observed
- Different approaches for treatment and spread control



Epidemiological and medical research

Main checks:

- Reliable and well-known sources.
- Providers of information who have required expertise.
 - Opinion x research
- Compare different sources instead of relying on a sole source.
- Transparency.





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2) COVID-19 and pandemic response unemployment model

Josephine Robertson

<https://www.actuaries.org.uk/practice-areas/foa-covid-19-action-taskforce-icat-workstreams/icat-workstreams-overseen-health-and-care-board>

Overview

Unemployment modelling:

- *UK unemployment forecasts* where the working group have provided *an application using R-Shiny* to enable actuaries to consider a *range of expert opinions and functionality to create custom scenarios*. The code for this is open access.

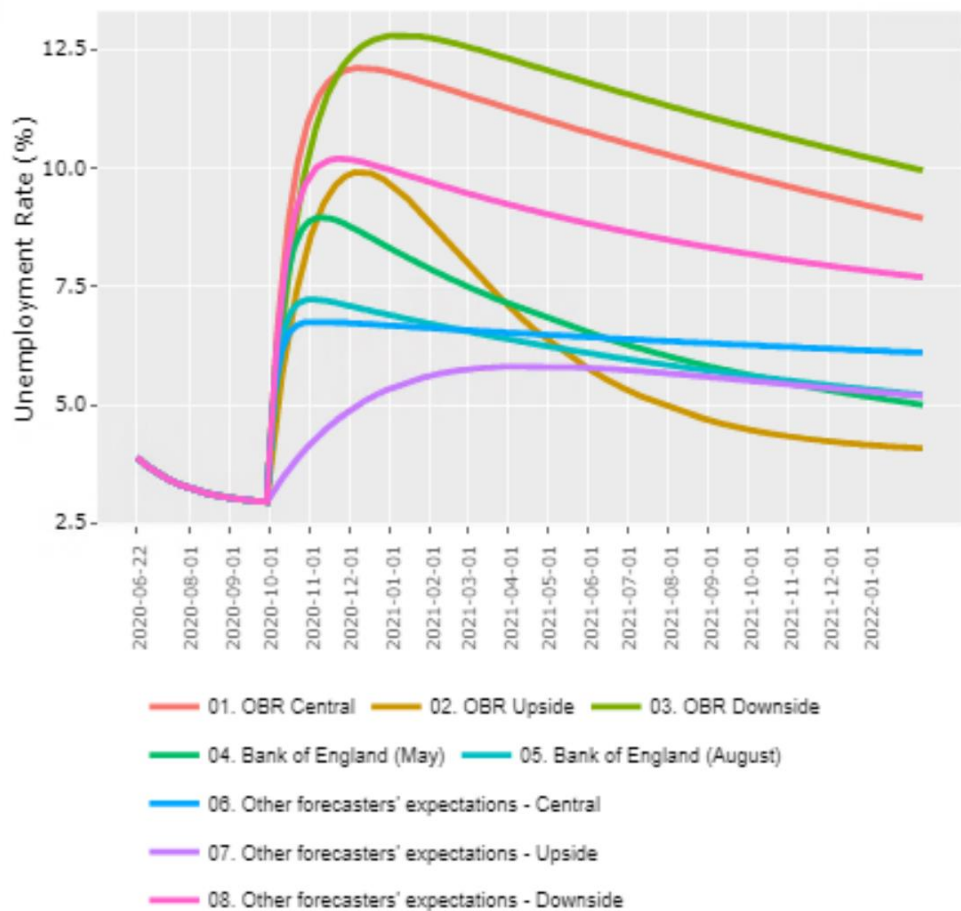
Aim:

- To create discussion within the profession regarding the impact of unemployment on population health and wellbeing, and the subsequent claims implications.
- Actuaries need to make difficult judgement calls on future forecasts of unemployment, including the correlation to health/wellbeing.



The model

Figure 3 : Comparison of unemployment rates



Structure and scenarios:

- Multi-state model of 3 states (Employed, Furloughed, Unemployed)
- Furlough and Post-Furlough (impact of unwinding the scheme)
- Explore range of scenarios
- Create custom scenarios

<https://johnng.shinyapps.io/Unemployment-MultiStateModel/>



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UK Statistics

Figure 4: The redundancy rate increased by 7.2 per thousand on the year, but decreased by 2.3 per thousand on the quarter, to 11.0 per thousand

UK redundancy rate¹, people aged 16 years and over (not seasonally adjusted), between November 2005 to January 2006 and November 2020 to January 2021



Source: Office for National Statistics - Labour Force Survey

28 April 2021

- Number of employees
 - 693,000 fall Feb 21 vs 20
 - under 25s account for over 60% of fall
- Number of vacancies
 - 60% lower Summer 21 vs 20
 - 27% lower Winter 21 vs 20
- Unemployment rate
 - 5% for Nov 20 to Jan 21
 - 1.1 percentage points higher vs 2020
- Redundancy
 - 7.2 per 1000 higher Jan 21 vs 20

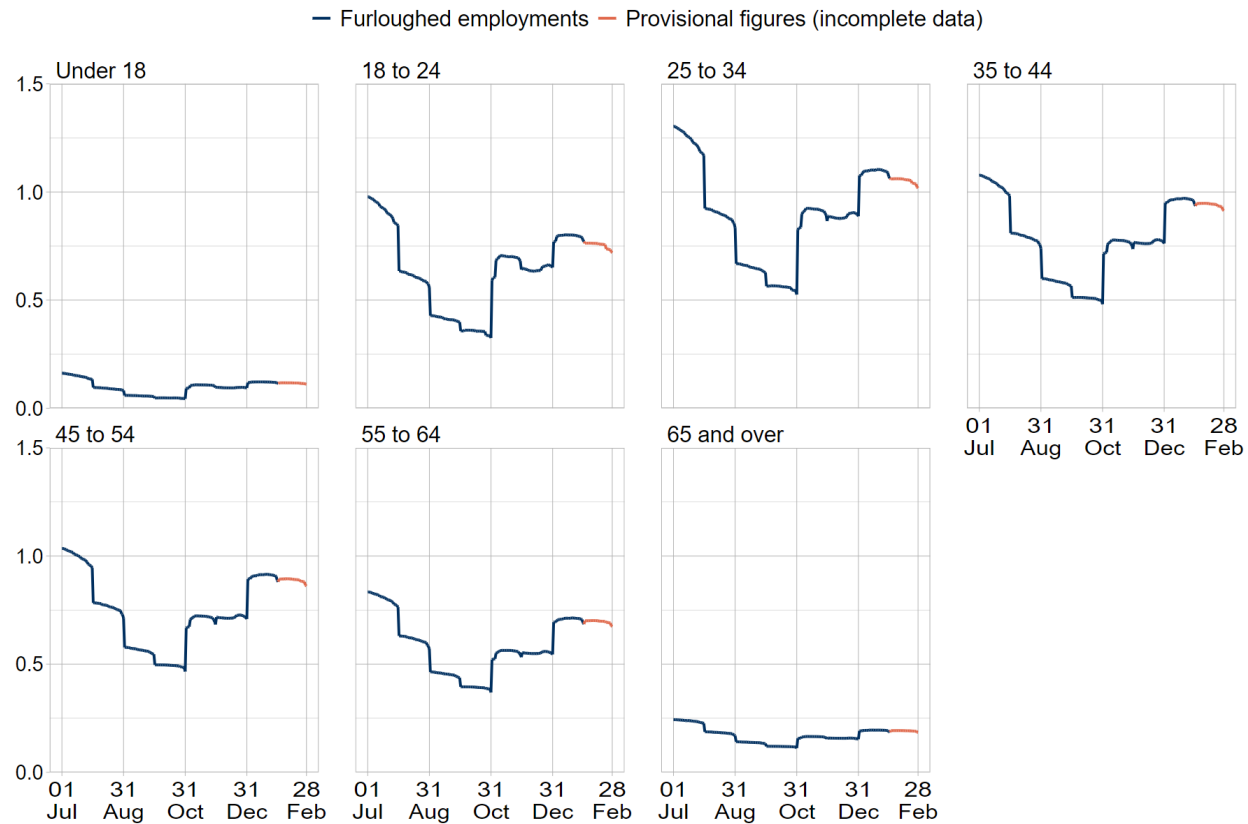


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Pandemic response

Figure 6: Total employments furloughed (millions) by age of employee, 1 July 2020 to 28 February 2021



Source: HMRC CJRS and PAYE Real Time Information data

- Cumulative jobs furloughed
 - 11.4 million as at 15th March 2021
- Exposure by:
 - Industry
 - Employer size
 - Geographical region
 - Age band
- Variation in:
 - total impact
 - permanent scarring vs rebound as restrictions ease



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3) Mortality Impact of COVID-19 Vaccination

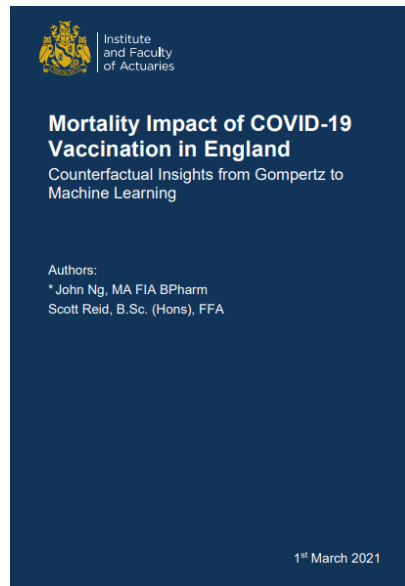
John Ng

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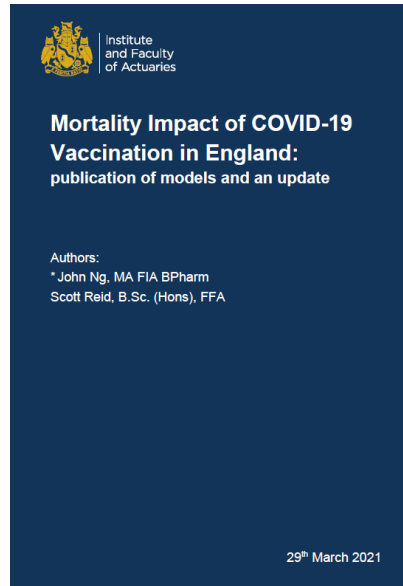
Key Questions

- What is the mortality impact of COVID-19 vaccination in England?
- Are there signals from antibody data?
- How do our results compare with other studies by Public Health England and Warwick University?

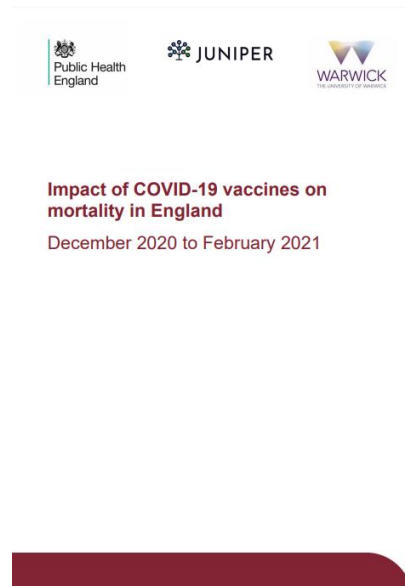
IFoA paper 1 (1 Mar)



IFoA paper 2 (29 Mar)



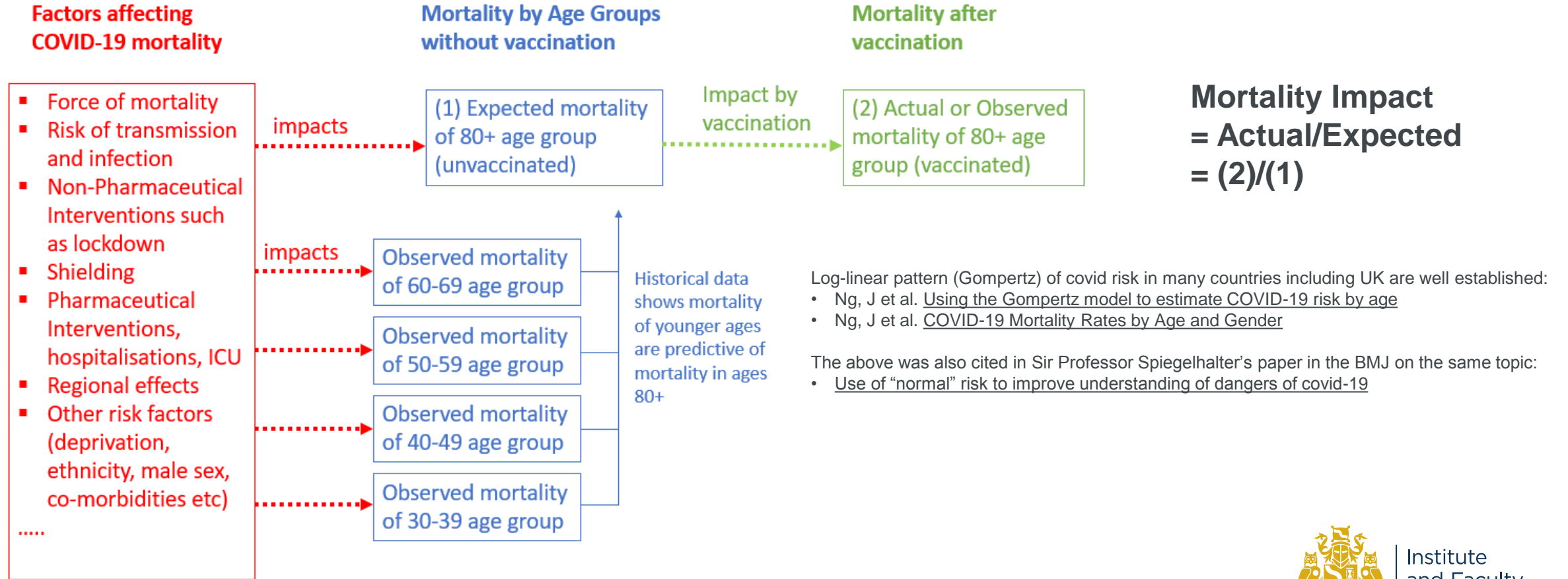
PHE and Warwick study (26 Mar)



Warwick study (18 Mar)

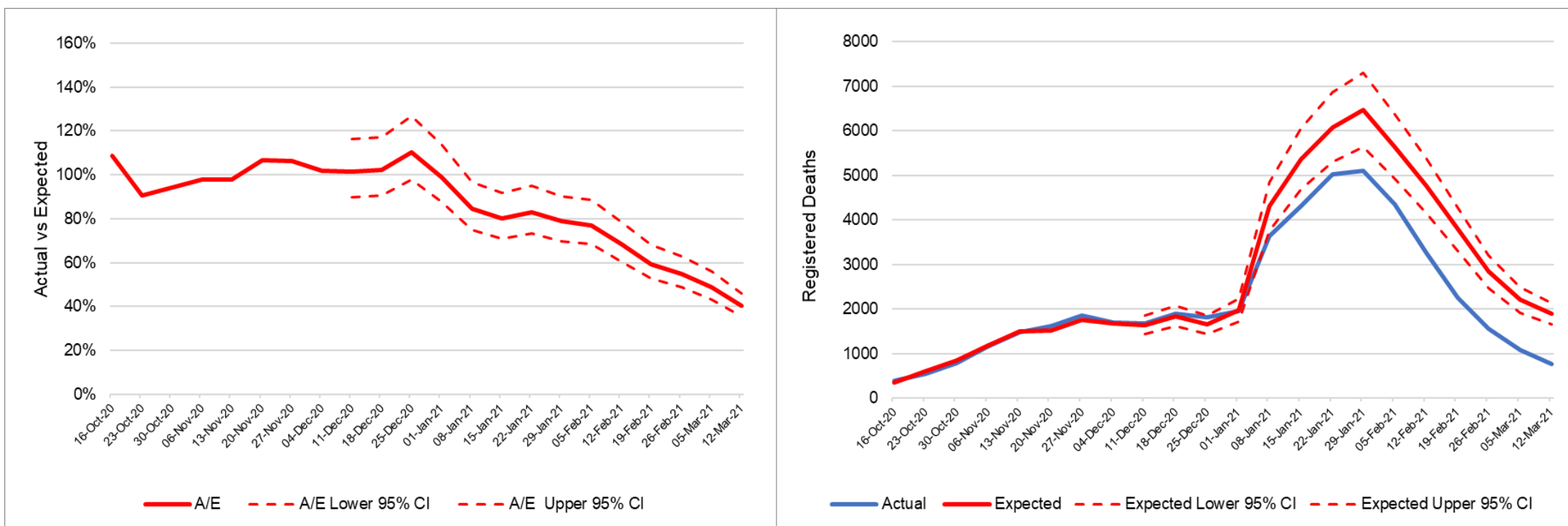


Age-structured COVID-19 Mortality Modelling

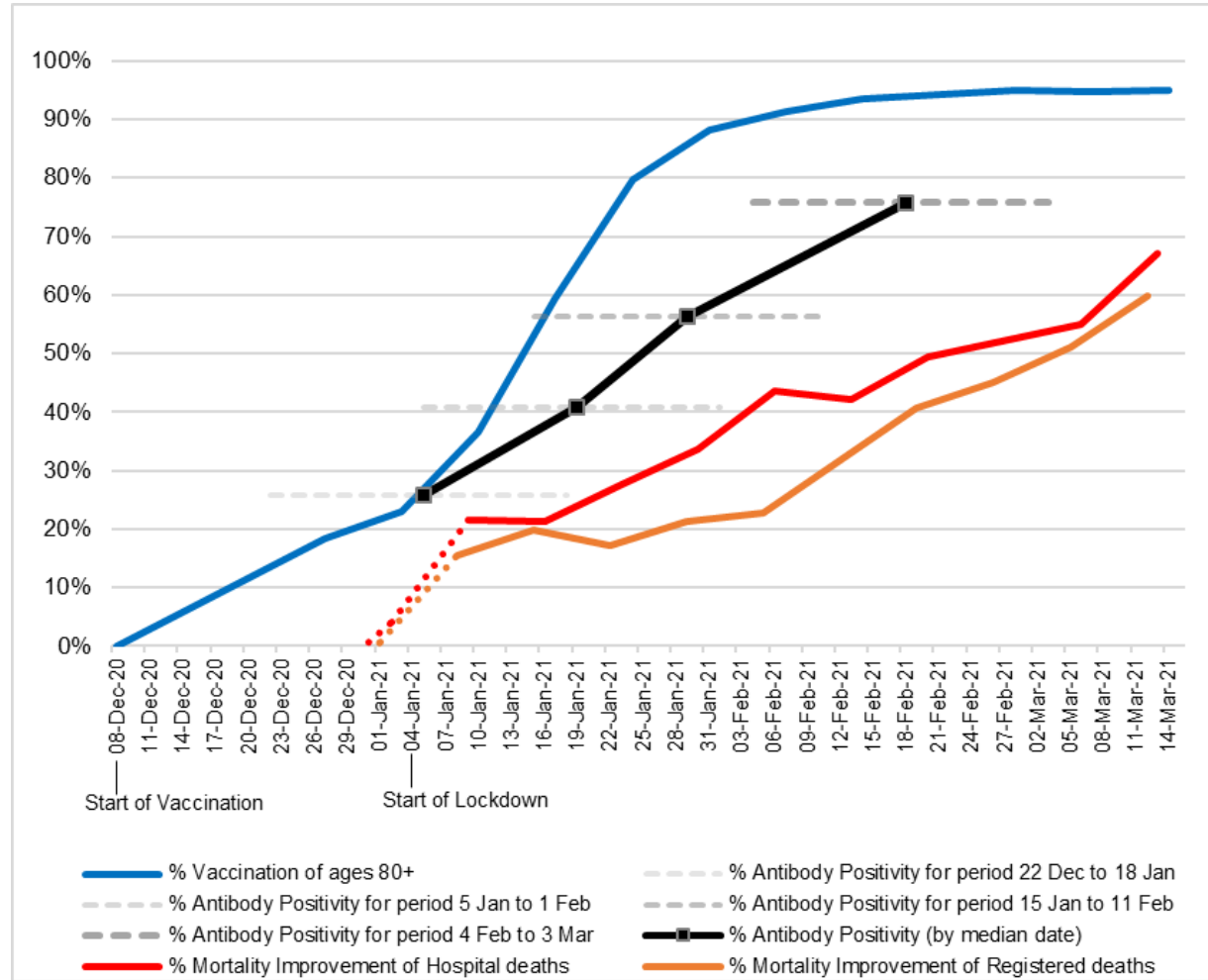


Counterfactual Models of Hospital and Registered Deaths

- See [paper](#) for detailed methodology. Models and codes are available for open access on [GitHub](#)
- Hospital Deaths analysis using Linear Regression model
- Registered Deaths analysis using Gompertz Network model – see results below



Vaccination Rates, Antibody Positivity and Mortality Improvement in ages 80+



Comparison against PHE and Warwick studies

	PHE model	Warwick Model	IFoA Model
Approach	Daily mortality impact = vaccine effectiveness against mortality x vaccine coverage	Dynamic age-structured model and run simulations	Expected deaths of ages 80+ is predicted from observed mortality of younger age groups
Vaccine effectiveness against death	81%	82%	Independent
Vaccine doses to date	Dependent	Dependent	Independent
Time lag to death	31 days	Dependent	Independent
Deaths prevented	6100 by end of Feb; 6700 if vaccine effectiveness is 85%	6592 by end of Feb	Ages 80+: 8000 from mid-Jan to end of Feb; 10,300 by mid-Mar

Conclusion: Vaccines are already saving a lot of lives in England



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4) How the protection industry has been impacted and may change longer term

Chris Reynolds

<https://www.actuaries.org.uk/practice-areas/foa-covid-19-action-taskforce-icat-workstreams/icat-workstreams-overseen-health-and-care-board>

Impact on New Business



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COVID-19 Report

Impact on New Business

by Adele Groyer, Christopher Reynolds, Vicky Gardner

This report is produced by a Health and Care
workstream of ICAT (IFoA Covid-19 Action
Taskforce)

12 May 2020

- Written at an early stage of the pandemic
- Largely a thought piece considering the potential challenges posed by COVID-19 on the distribution and risk management of new business
- Considered both UK Individual and Group Protection
- 4 dimensions considered:
 - Distribution
 - Underwriting
 - Product Design
 - Claims Costs



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Expectations

Distribution

- Face-to-face distribution will be limited because of social distancing measures.
- Drop in new mortgages will likely cause a reduction in protection policies.
- New customers may be unable to transact because of financial pressure.
- Distributors in the group benefits space may not get the attention of key decision-makers.

U/W

- Application form questions changed to identify applicants who already have possible symptoms of COVID-19
- Doctors' reports were expected to be more difficult to obtain as medical professionals divert attention to managing COVID-19 impacts
- Face to face screening paused.

Product Design

- Impact on value add services – well being and access to remote medical services.
- COVID-19 exclusions.
- Effectiveness of Moratoria

Claims Costs

- Mortality business expected to increase in the short term. Uncertainty about impact on insured population.
- CI not expected to be directly impacted. Indirect impact from access to healthcare
- Income protection benefits with short deferred periods directly impacted.



Update

- Life Claims



Aegon records 17% rise in life claims during 2020

Cover – 31st March 2021

- CI Claims



LV= sees drop in critical illness claims during Covid

Cover – 21 Sep 2020

- Income Protection



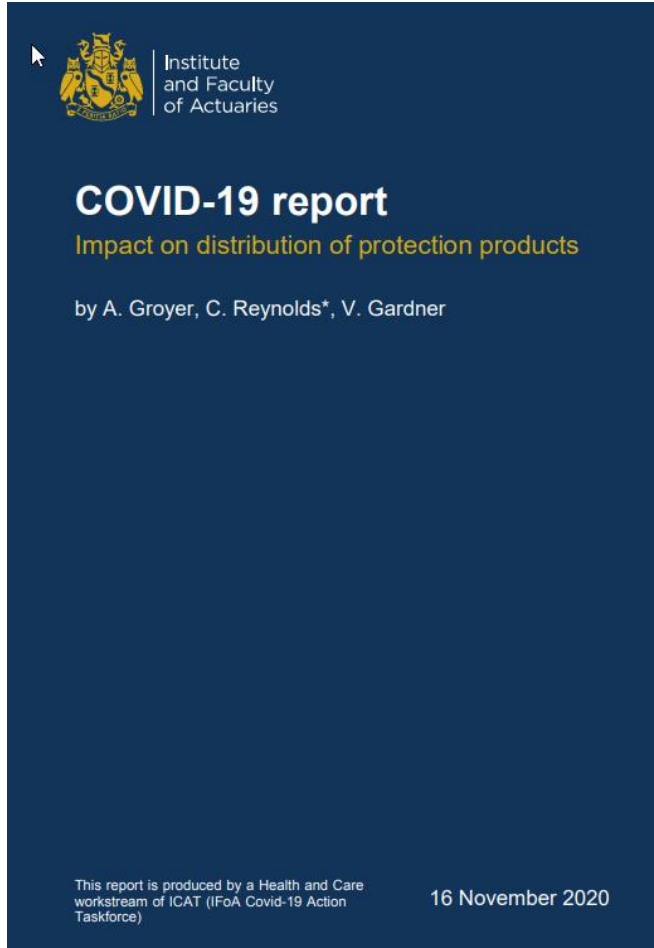
Holloway Friendly drops Covid exclusions

Cover – 15 March 2021



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Impact on Distribution



- More detailed consideration of the impact that COVID-19 had had and was continuing to have on the distribution of protection products in the U.K
- Considered the impact of the pandemic during the initial phase (when a strict lockdown was in place), the period following the strict lockdown and the potential long-term impact of the pandemic.
- For each phase considered the impact on sales volumes, consumer demand and the ways of working.
- Incorporated the findings of a series of questions that had been posed to UK insurers.

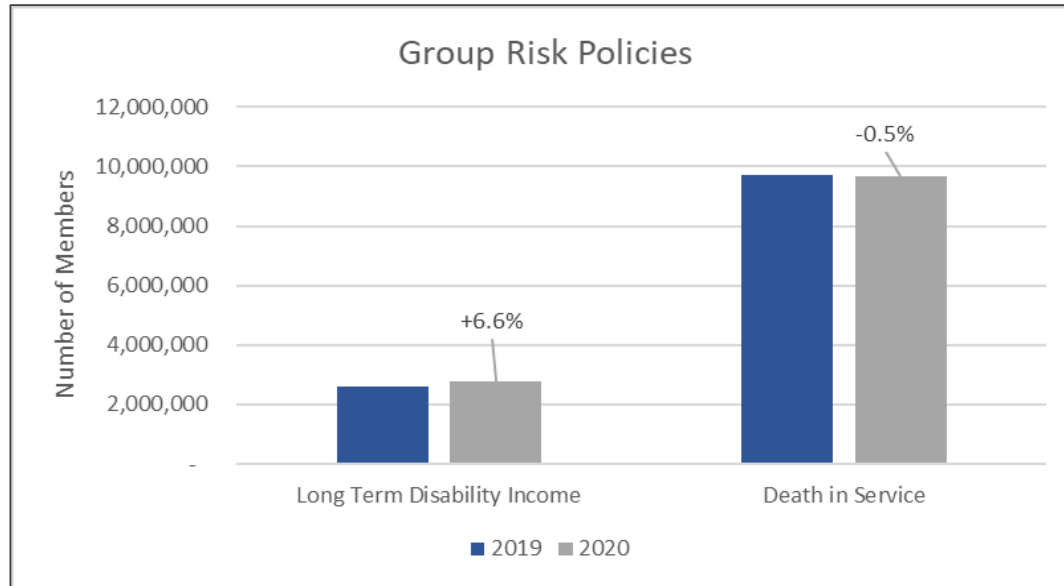
Expectations

	Volumes & Mix	Consumer demand	Ways of working
Short Term	<ul style="list-style-type: none"> Telephony-based firms maintained volumes better than face-to-face firms. 	<ul style="list-style-type: none"> Consumer interest increased, but not necessarily translating into an increase in sales 	<ul style="list-style-type: none"> Face to face meetings cancelled Firms adopting to wider use of phone and video-conferencing platforms to talk with customers
Long Term	<ul style="list-style-type: none"> Insurers generally considered the longer-term prospects for the market to be positive Some concern about impact of economic headwinds - depress demand and impact persistency. 	<ul style="list-style-type: none"> Pandemic reminded consumers of the importance of protection products 	<ul style="list-style-type: none"> Digital capability increasingly important and this will continue in the longer-term. Expectation of video capability & large range of on-line activities Risk of loss of experience

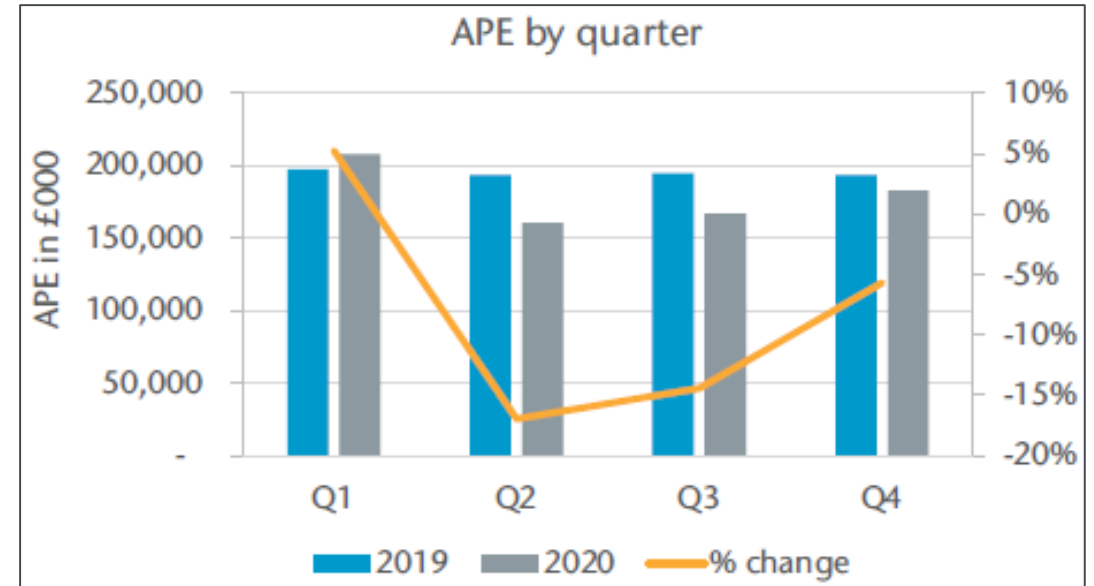
COVID-19 has had, what is likely to be, an irrevocable change on the distribution of protection products



Update



Source: Swiss Re Group Watch 2021



Source: GenRe Protection Pulse





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5) Social Care

James Cripps

<https://www.actuaries.org.uk/practice-areas/foa-covid-19-action-taskforce-icat-workstreams/icat-workstreams-overseen-health-and-care-board>

Overview

In our report we considered the short-term and long-term impact of Covid-19 on provision of social care and on those receiving care. At the time there was very little data or insight into the impact it was having into that sector. We considered this through the following lenses:

- **Mortality experience** within the care sector
- **Demand for care** during the pandemic and impact of any lack of access to social care could have on the health and wellness of those needing care. We will also explore the **behavioural change** in those seeking care.
- **Availability of care** and the impact of staffing and use of agencies.
- **Cost and changes in the provision of care** and the impact of the change in practices, the cost of PPE, as well as the availability of paid staff and volunteers.
- **Support provided by the government** and local authorities
- **Economic effects** on social care funding



Social Care Overview

Social care setting	Number of people receiving care in the UK	Data source
Care home	411,000	London School of Economics
Domiciliary care	500,000	UK Home Care Association (UKHCA)
Community-based care and support at home	417,910	NHS Confederation 2012/2013

- More people receive care in their own home than in a care home
- 1.5 million people are employed in adult social care
- 9.1 million unpaid carers pre-pandemic, plus 4.5 million new carers during pandemic



Key events for care in 2020

January 30	•WHO declares a global health emergency
March 14	•The number of confirmed cases rises to 1,140 in the UK, 925 in England, 121 in Scotland, 60 in Wales and 34 in Northern Ireland.
March 17	•NHS England and NHS Improvement request discharging of more patients to make room for COVID-19 cases
March 19	•The government announces £1.6bn for local authorities, to help with the cost of adult social care workforce and for services helping the most vulnerable, including homeless people; £1.3bn will be used to enhance the NHS discharge process
March 23	•Lockdown announced on the evening of March 23
April 10	•The CQC started reporting COVID-19 death notifications among care home residents and home care recipients
April 14	•Several UK charities, express their concern because they focus on hospital deaths and do not include those in care homes
April 15	•NHS England and the CQC begin rolling out tests for care home staff and residents
April 28	•The ONS report indicates a third of COVID-19 deaths in England and Wales are occurring in care homes
May 5	•Deaths per week in hospital are falling while those in care homes continue to increase.
May 12	•Care home death rate starts to decrease.
May 15	• Announcement that every resident and staff member in care homes in England will be tested for COVID-19 by early June
June 8	•The Department of Health and Social Care extends availability of tests to all adult care homes

- 17 March: discharge of hospital patients into care homes to accommodate Covid-19 surge
- 19 March: £1.6bn additional funding for adult social care
- 15 April: Care home Covid-19-testing introduced for suspected cases
- 15 May: Plan for asymptomatic testing in care homes announced (only rolled out in September)
- New area of focus - Care home staff and the potential mandating of coronavirus vaccination



Excess deaths among people receiving care

- Special Care Quality Commission data released via the ONS, covering 10 April to 19 June 2020 for England released July 2020
- Deaths in this period were double deaths in corresponding period in 2019 for care home residents and home care recipients
- More Covid-19 under-reporting among home care recipients (26% of excess attributed to Covid-19)

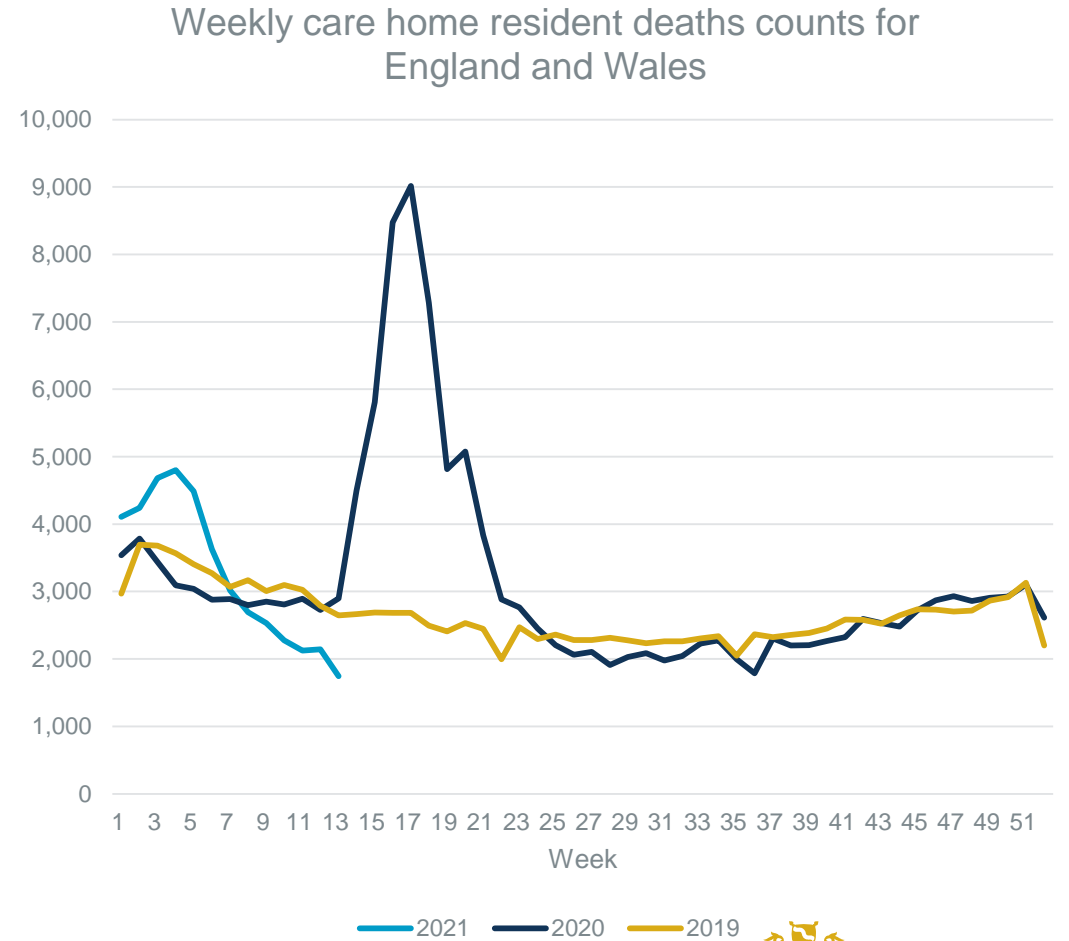
Metric	Care home residents	Home care recipients	Total
2020 all cause deaths as a % of 2019 deaths	201%	192%	200%
Deaths in 2020 excluding COVID-19	28,395	5,704	34,099
COVID-19 deaths only	17,736	819	18,555
Excess deaths in 2020 = 2020 deaths less 2019 deaths	23,181	3,122	26,303
COVID-19 as a % of excess	77%	26%	71%



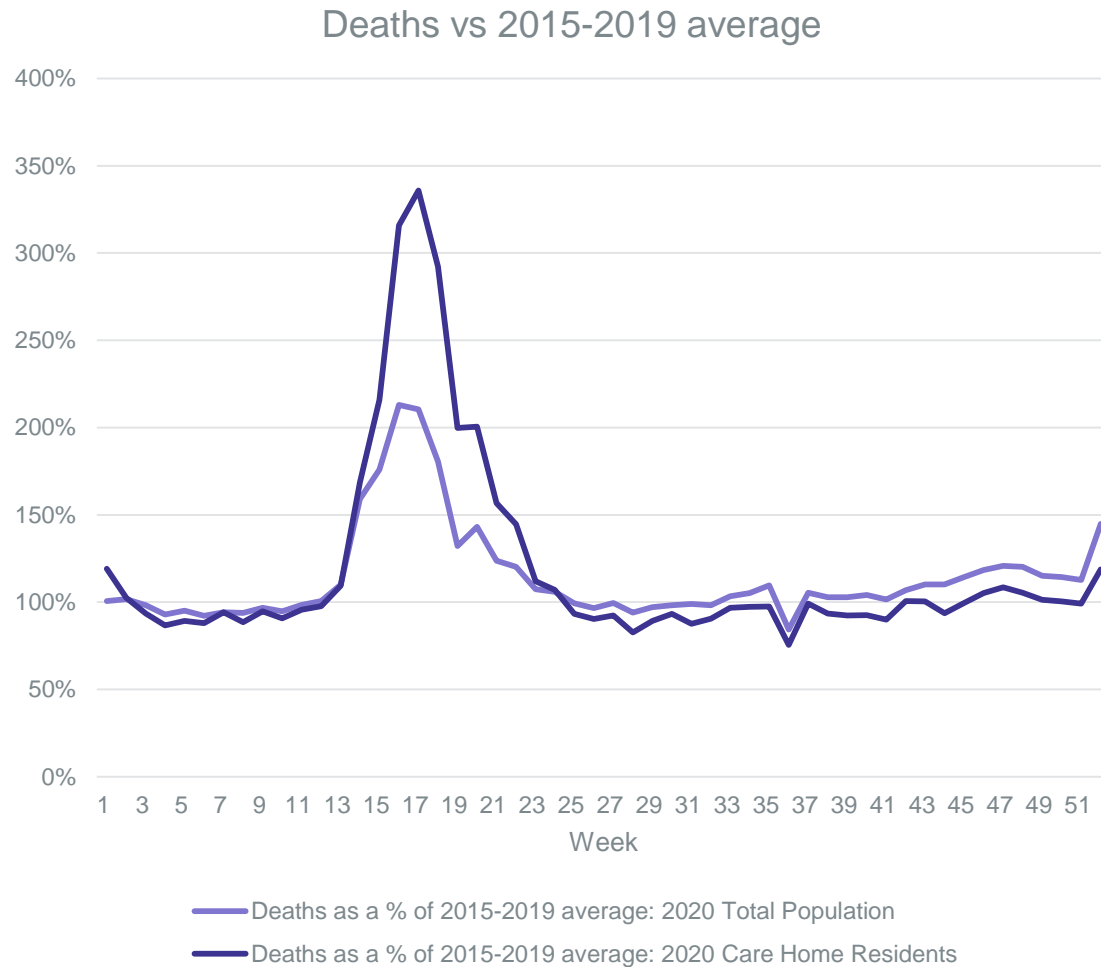
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Data released subsequently

- ONS publishes weekly statistics for notifications of deaths among care homes residents in England & Wales (since January 2021)
- Includes weekly death counts for
 - 2015-19 average
 - 2020
 - 2021
- Death notifications peaked at 9,015 in week 17 of 2020 (week ended 24 April)
- Deaths since week 8 of 2021 are below prior year levels
 - Lower occupancy
 - Possible reduction in deaths from other infectious diseases



Other cuts of the newer data



- The care home excess death % had a higher peak vs general population (336% vs 213%)
- Excess deaths among care home residents were higher vs total population for weeks 14 to 25
- From week 25 onwards care home resident deaths as a % of 2015-2019 average were lower than the same ratio for the general population
 - Primary driver likely to be lower occupancy
 - Potentially some mortality displacement



Impact of Covid-19 on social care

- Home care agencies and care homes subject to increased costs
 - Additional PPE costs
 - More staff needed to maintain bubbles with staff shortages
 - Sick pay to deal with staff absence, no sick pay is a disincentive to be tested
- Reduced demand for care home places
 - Typical occupancy 88%
 - Estimated at 79% second half of 2020, will take till November 2021 to recover to pre-pandemic levels 1
 - Occupancy below 85% affects financial viability
- Future funding models
 - Wider economic impacts of the pandemic to squeeze public purse
 - No social care funding solution is in place, omitted from 2021 NHS restructure. An IFoA response was sent in March 2021





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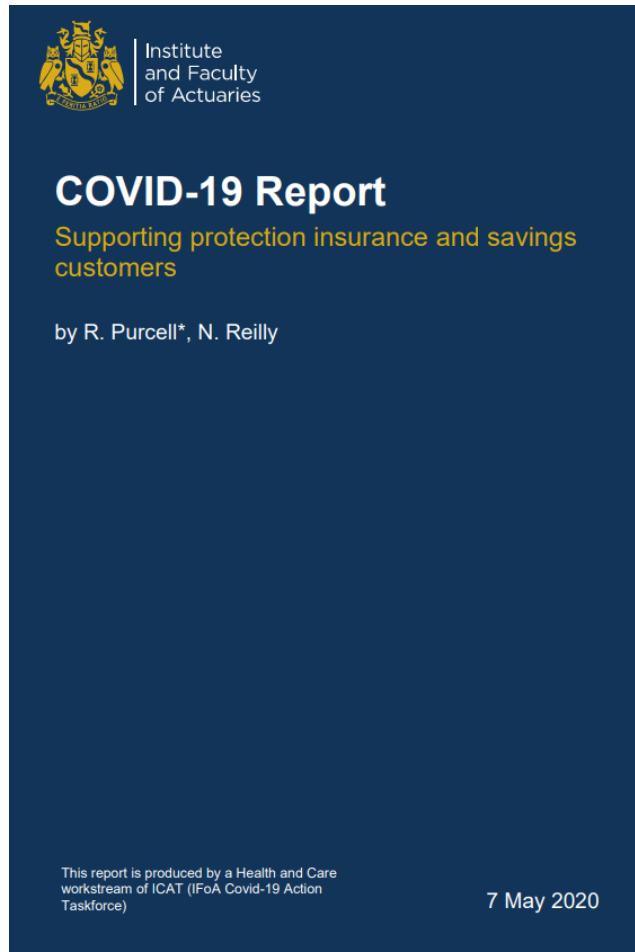
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6) Supporting Protection Insurance and Savings Customers

Richard Purcell

<https://www.actuaries.org.uk/practice-areas/foa-covid-19-action-taskforce-icat-workstreams/icat-workstreams-overseen-health-and-care-board>

Supporting protection insurance and savings customers



In May 2020, we considered the potential direct and indirect impacts of COVID-19 on protection and savings customers and what can be done by government and insurers to support them.

Key themes:

- Maintaining access to insurance
- The economic consequences and how to soften them
- In-direct health impacts
- Long term impact on product design and consideration of risk pooling



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7) Economic hardship, health and COVID-19

Scott Reid

<https://www.actuaries.org.uk/practice-areas/foa-covid-19-action-taskforce-icat-workstreams/icat-workstreams-overseen-health-and-care-board>

Economic consequences of COVID-19

Overview

- Deep recession due to unprecedented government Non-Pharmaceutical Interventions (NPI) during 2020
- Certain industries severely impacted
 - Hospitality, Travel and retail shops.....
- Economic stress is primary driver for mental health and subsequent impact on income protection claims
- Paper published in October when there was great uncertainty around the economy

Aims of paper

- Consider key research papers based on previous recessions
- Infer what this may mean for this recession focusing on mental health
- To create discussion within the profession regarding the impact of unemployment on population health and wellbeing, and the subsequent insurance claims implications

Update

- Furlough scheme extended to Sept 21 (previously October 20) , so unemployment has remained below previous forecasts (BoE and OBR)
- Successful rollout of vaccination in the UK and other countries is increasing optimism
 - BoE latest projection unemployment is 5.5% Q1 2021, 5.7% Q1 2022 (BoE Monetary Policy Report February 2021)



Key findings of research...

Health inequalities

- Likely to widen for individuals more vulnerable to financial hardship
 - Including lower socio-economic groups and younger adults

Countries wealth

- Less affluent countries with lower GDP per capita may be impacted more compared to wealthy countries
 - Population being more vulnerable to health and wellbeing consequences

Vulnerable groups

- Increase in death rates of vulnerable groups (lower economic and younger adults)
 - Correlation between unemployment and suicides

Alcohol and drugs

- Elevated due to mental health issues (based on previous recessions)
 - Drugs related deaths in current recession have increased but this may not be caused by greater use:
 - Overdose in lockdown is more likely to lead to death
 - Reduced drug trafficking due to cross border travel where drugs mixed with noxious substances to bulk them out

Mental health issues

- Increase in mental health issues driven by economic consequences
- Increase due to pandemic itself
 - lockdown and social restrictions; losing loved ones; constant fear of loss of life
- Long term health impacts for survivors of SARS-CoV-2 virus (based on SARS in 2002)



Questions

Comments

Expressions of individual views by members of the Institute and Faculty of Actuaries and its staff are encouraged.

The views expressed in this presentation are those of the presenter.



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