Government Actuary's Department

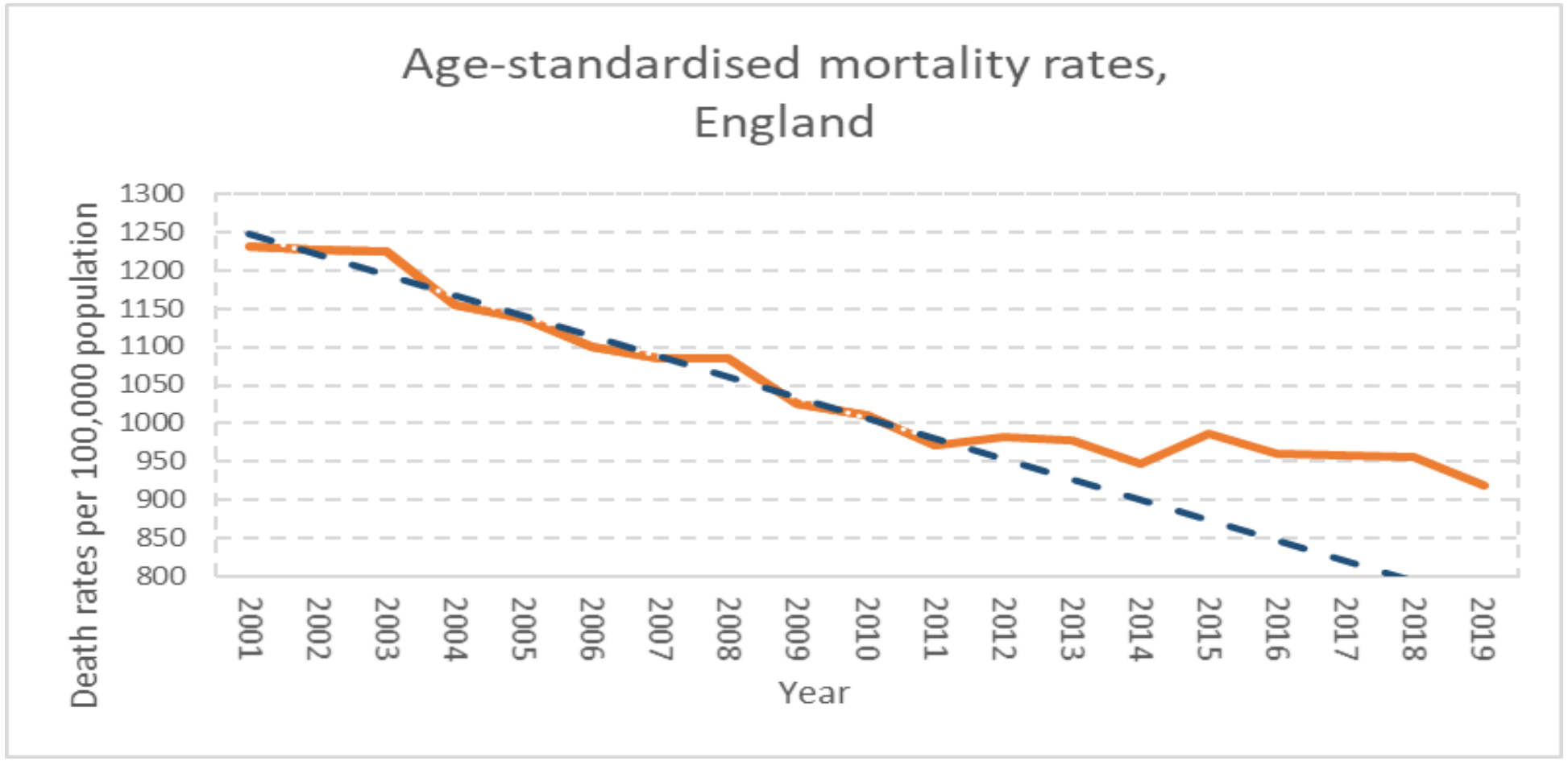
GAD Making sense of COVID-19

Mortality impact on pension schemes

Zoom Webinar

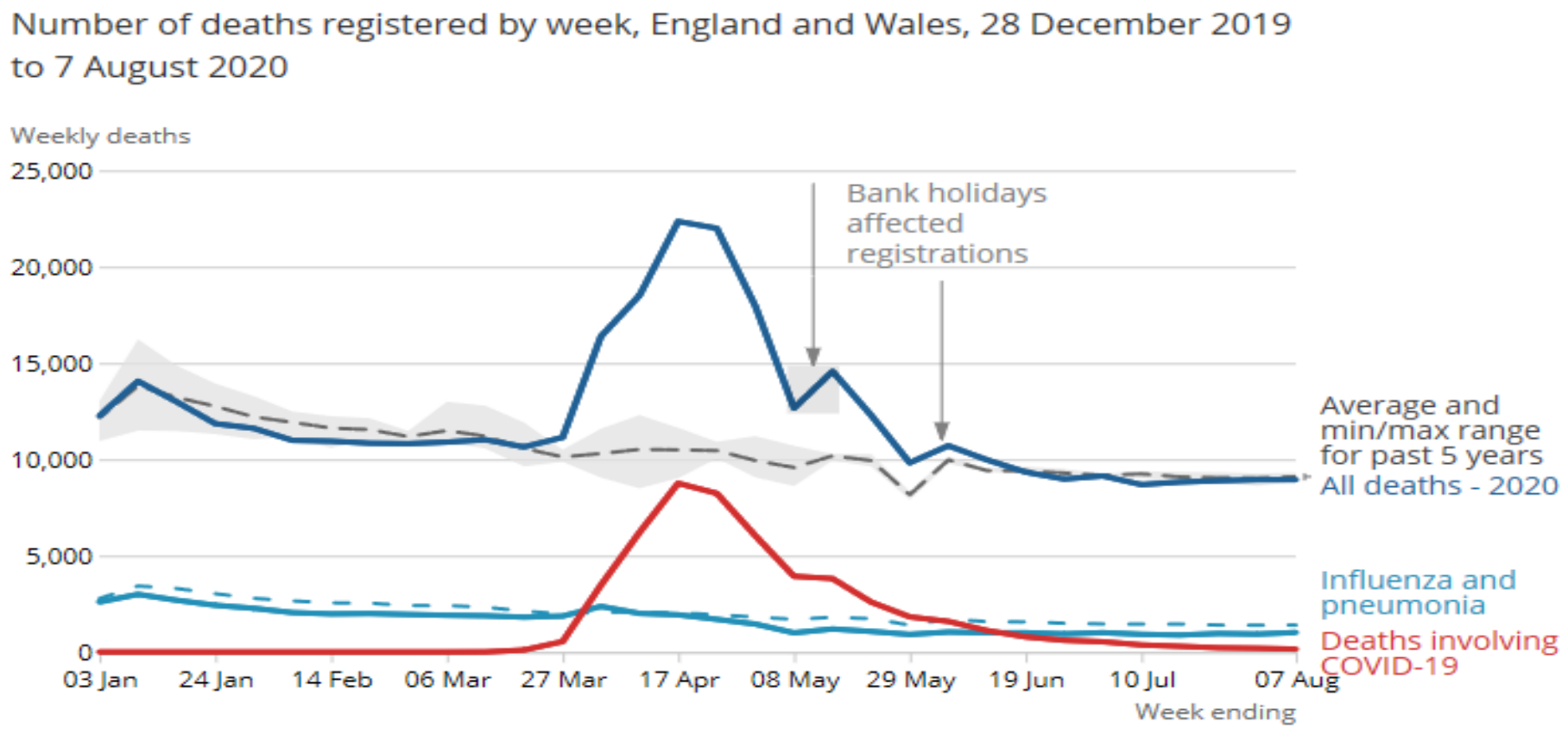
19th August 2020

Mortality experience (longer term)



GAD chart using ONS data

Recent experience (2020)



Source: Office for National Statistics – Deaths registered weekly in England and Wales

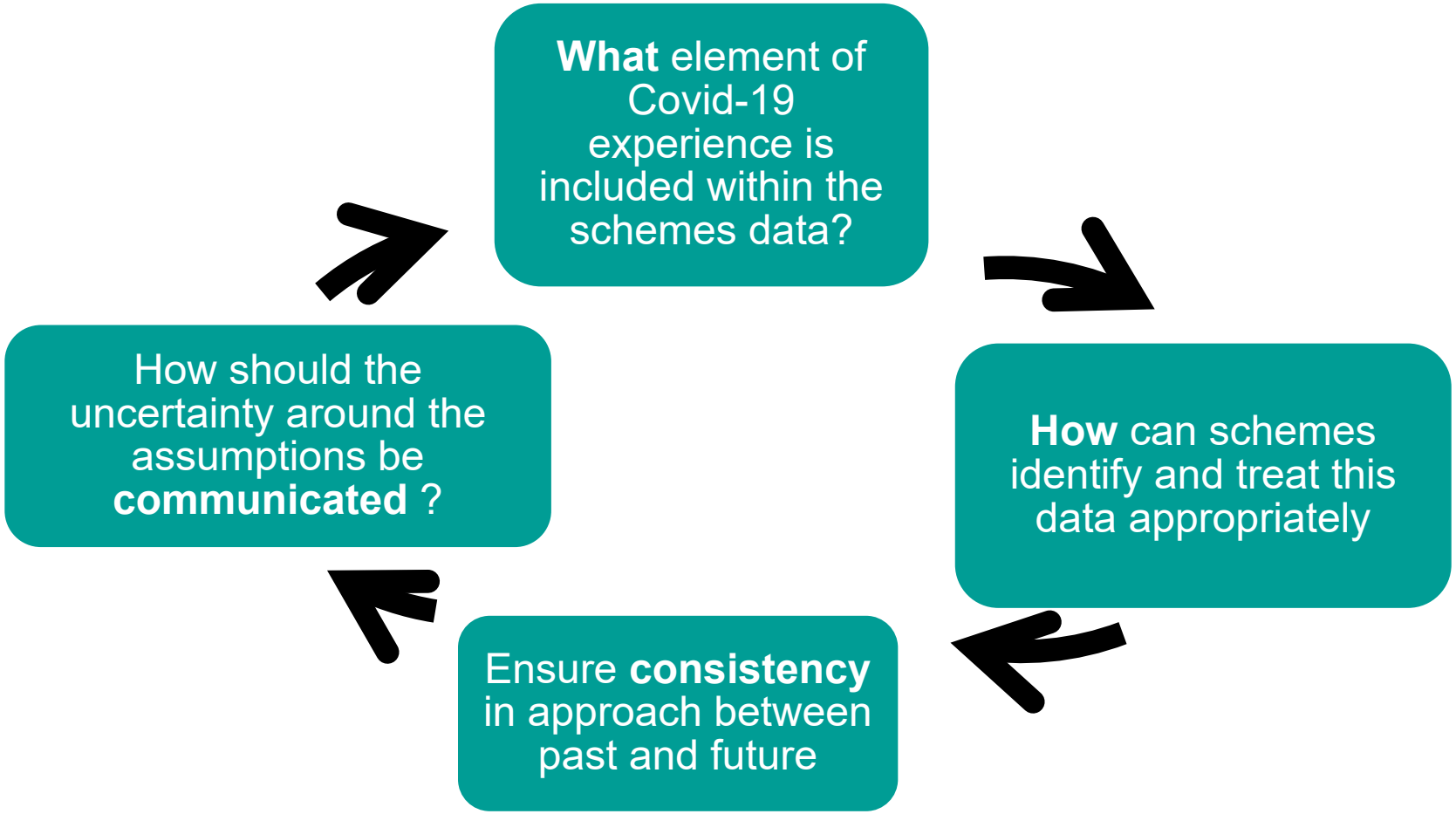
Possible impacts on future longevity

Increasing future mortality rates	Decreasing future mortality rates
No suitable vaccination program	Successful vaccination developed / improvement in treatment
Delays in diagnosis / longer waiting time for treatment	Healthier life-styles adopted in lock down continue
Longer term health impacts for survivors	Isolation and behavioural changes decreases other diseases such as seasonal flu
Un-healthy life-style impacts (less exercise, increased substance abuse, loneliness)	Healthier survivors have lower mortality rates
Longer term impact of the economy compromises future healthcare	

Setting mortality assumptions

Pre Covid-19 “standard” approach	Discussions and solutions	Additional analysis required?
Analyse actual deaths relative to appropriate population	Consider extent of Covid-19 exposure in experience	Scheme specific consideration of impact in data and possible future
Obtain best estimate base table	How should this be allowed for?	Could consider experience in 2020?
Consider appropriate future improvements	How does this impact future improvement expectations	Sensitivities around these uncertainties helpful in communicating

Considerations – What and how?



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ONS Analysis

Published

- Weekly death registrations in England and Wales
- Deaths involving COVID-19 monthly (Monthly Mortality Analysis)
- Deaths involving COVID-19 by local area and deprivation
- COVID-19 deaths by ethnicity, religion and disability status
- COVID-19 deaths by occupation
- Analysis of death registrations not involving coronavirus (COVID-19)

Upcoming

- Update already published analysis
- COVID-19 deaths by occupation, including distinguishing where the infection may have been acquired either before or during the period of lockdown
- Deaths of care home residents, England and Wales
- COVID-19 deaths across space and time
- Analyse connections between hospital admission and risk of death involving COVID-19
- Publish an experimental ‘beta’ health index as an overall measure of the nation’s health

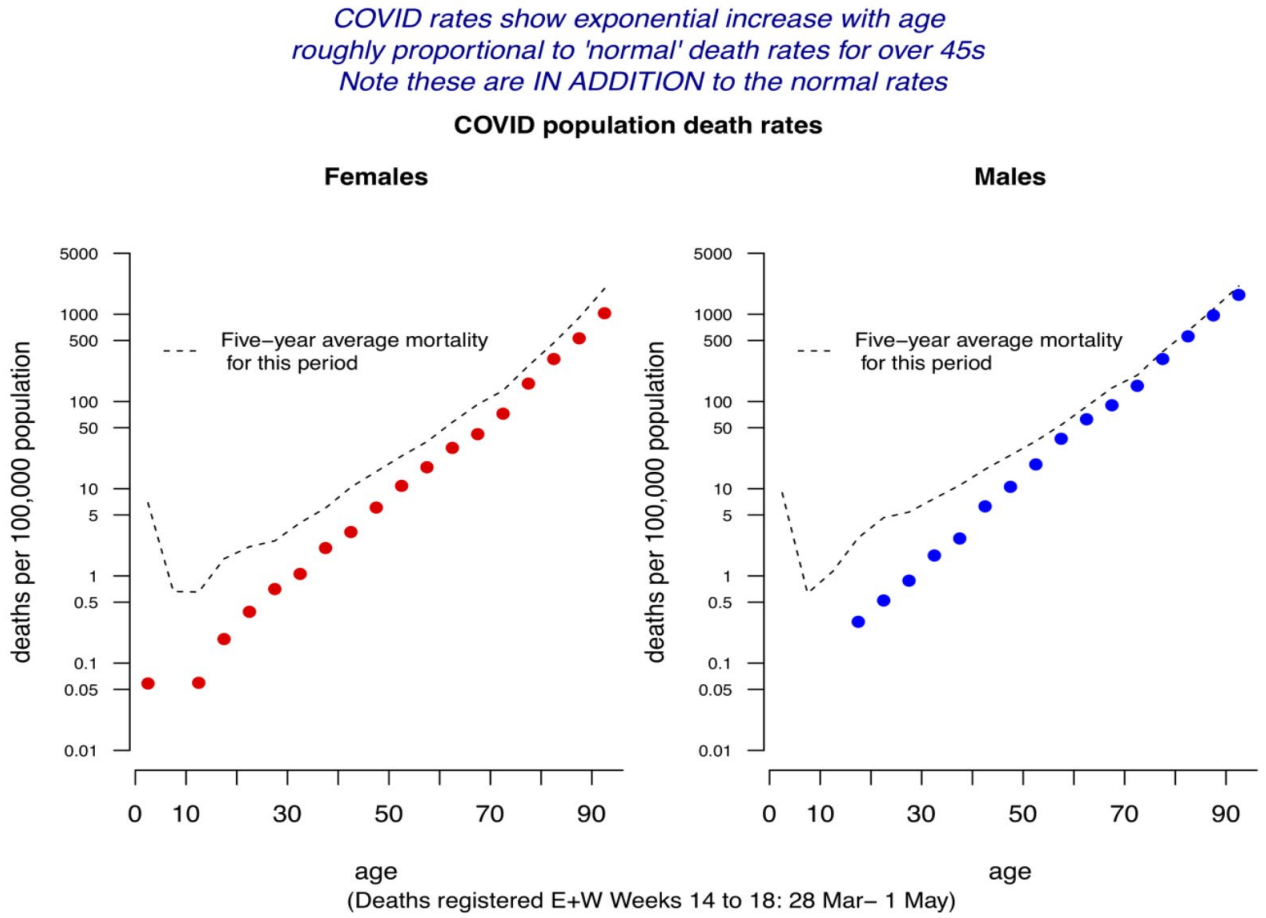
HERIOT WATT UNIVERSITY

Prof. Andrew J.G. Cairns

Heriot-Watt University

Covid-19 mortality seems to be proportional to all-cause mortality at adult ages

The age gradient of Covid-19 deaths in England & Wales compared with non-Covid-19 deaths from all causes (Source: David Spiegelhalter blog)



COVID population death rates for females and males on a logarithmic scale — data from ONS.

- Covid-19 appears to increase a cohort's short-term mortality risk by a common multiplicative factor, whatever their current baseline mortality risk.
- Older people are more "frail" and so are more likely to die in the next year.
- Within a cohort, some people are more "frail" than others.

We observe a possible link between “frailty” and Covid-19 mortality

- Spiegelhalter’s graphic suggests the following way to look at Covid-19 mortality for age x:

$$\text{Covid Mortality Rate}(x) = \text{All cause mortality rate}(x) \times \text{infection rate}(x) \times \text{relative frailty}(x)$$

- “Frailty”: the probability of death in the next year

- The graphic suggests that infection rate(x) × relative frailty(x) does not depend much on age, but has some dependence on gender.

We can now refine the possible *link* between "frailty" and Covid-19 mortality

- Further analysis using ONS data by region and IMD decile refines this.
- Analysis suggests after allowing for regional variation (e.g. London has experienced much higher infection rates)

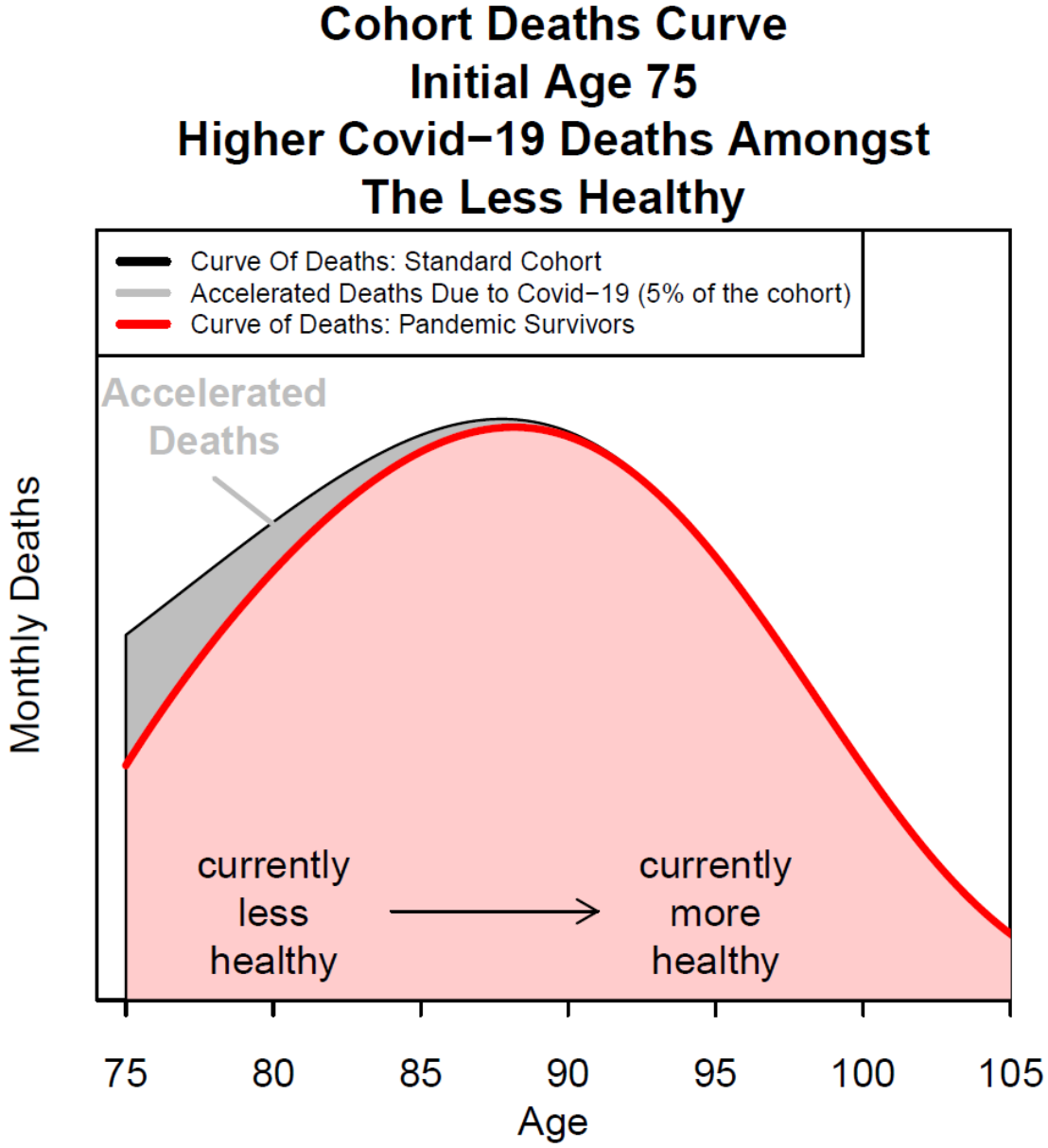
$$\text{Covid Mortality Rate}(i,x) = \text{All cause mortality rate}(i,x) \times \text{infection rate}(i,x) \times \text{relative frailty}(i,x)$$

where i = IMD decile

- But, equally, i could be down to the individual level and reflect individual co-morbidities/frailty ↔ *how to calibrate the accelerated deaths model*

People with existing health conditions are more likely to die from Covid-19.
Modelling

- Each cohort has a mix of people
  - Some more healthy than average
  - Some less healthy
- In normal times, the less healthy are likely to die earlier
- 2020 data suggests they are also more likely to die from Covid-19 if they get infected
- Pension fund perspective:
  - Those who survive could be more healthy than the average *pre-Covid*
  - *BUT:* the numbers suggest that this will be quite a small effect.
- *Other negative impacts of Covid could be bigger*



Adverse effects

- Covid survivors might have lung damage etc.
- Impact on people requiring other healthcare
- Impact of lockdown on behaviour
- Etc.

This is a lot of hypothesizing: *We now need good data*

- Detailed *antibody* survey data
    - Infection rates by region, deprivation, ethnicity etc.
- Analysis of individual health records to establish the links between co-morbidities and the chances of dying if you get infected
- Detailed follow-up of Covid survivors:
    - What proportion are carrying forward impairments?

NB – a fuller version of this information (Covid-19 - MP4 file and .pdf paper) are available at http://www.macs.hw.ac.uk/~andrewc/