



Prioritising population health: calibrating COVID-19 deaths with mortality due to inequality in the UK

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COVID-19 mitigation

- Urgent action required
 - Virus will spread
 - NHS will be overwhelmed
 - Economic output reduced
 - Large numbers of deaths

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Articles

Premature mortality attributable to socioeconomic inequality in England between 2003 and 2018: an observational study



Dan Lewer, Wilum Joyntunga, Robert W Aldridge, Chantal Edge, Michael Marmot, Alistair Storr, Andrew Hayward



Summary

Background Low socioeconomic position is consistently associated with increased risk of premature death. The aim of this study is to measure the aggregate scale of inequality in premature mortality for the whole population of England.

Methods We used mortality records from the UK Office for National Statistics to study all 2 465 285 premature deaths (defined as those before age 75 years) in England between Jan 1, 2003, and Dec 31, 2018. Socioeconomic position was defined using deciles of the Index of Multiple Deprivation: a measure of neighbourhood income, employment, education levels, crime, health, availability of services, and local environment. We calculated the number of expected deaths by applying mortality in the least deprived decile to other deciles, within the strata of age, sex, and time. The mortality attributable to socioeconomic inequality was defined as the difference between the observed and expected deaths. We also used life table modelling to estimate years-of-life lost attributable to socioeconomic inequality.

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This online publication has been corrected. The corrected version first appeared at [thelancet.com/public-health](https://www.thelancet.com/public-health) on January 3, 2020.
See Comment page e6

COVID-19 mitigation

Health Inequalities

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 - Economic output reduced
 - Large numbers of deaths
- Action plan
 - Multi-agency approach
 - Population level interventions

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Lack of will to undertake a multi-agency response for inequalities

“There is something terribly frustrating about the Marmot approach. Poverty is at the root of it all or poor education [he claims]. Yes, so what are we going to do about that? I’m from the Department of Health. There is not much we can do about it.”

Dame Sally Davies, CMO 2011-19, HSJ Interview Feb 2020

https://www.hsj.co.uk/comment/former-cmo-pointless-to-challenge-government-on-austerity/7027014.article?utm_campaign=Media%7027020Update%7027203%7027020March%7202020&utm_medium=email&utm_source=CMA_ROYAL%7027020COLLEGE%7027020OF%7027020PHYSICIANS%7027020AND%7027020SURGEONS%7027020OF%7027020GLASGOW&utm_content

Timeliness

COVID-19 - Immediate

- COVID-19 cases reported in China 22/01/2020, UK Government issued immediate advice on travel to Wuhan
- 62 days - initial report of cases to full implementation of mitigating effects

Inequalities – 19 years

- Black Report in 1980
- Targeted resource allocation for NHS in England in 1999
- Changes to benefits and welfare policy (1997-2010)

Volume of evidence before action

COVID-19 – 62 days

- Reports from WHO on 22/01/20
- Daily reports
 - Full mitigation response on 23/03/2020

Inequalities – 40 years

- Black 1980
- Acheson 1998
- Wanless 2003
- Leyland 2007
- Marmot 2010
- Marmot 2020

Statements of response

COVID-19

- Daily briefings
 - WHO Director General
 - Government ministers
 - DHSC, Chancellor, Business
 - PHE
 - CMOs
 - Devolved nations

Inequalities

- Black report published on August Bank Holiday Monday in 1980
- Muted response by UK Government to Marmot's report on stalling life expectancy

Quality of evidence

COVID-19

- Case fatality rate unknown but estimated
- likely an overestimate as denominator is unknown
 - those tested for the virus is a subset of all those with the virus

Inequalities

- Validated deprivation measures
- ONS/NRS produce
 - population at risk and deaths by deprivation measures

Language used

COVID-19

- COBRA committee convened
- SAGE
- Briefing by CMOs
- Media appearances (TV, radio, newspaper articles)

Inequalities

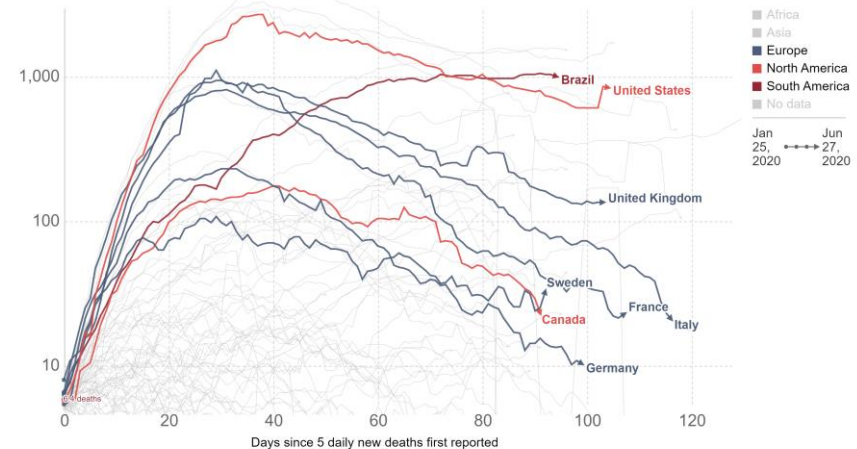
- Health Inequalities task force
- Annual reports from CMOs

Why does this matter?

- Modelling predicted **20,000 – 500,000** deaths due to COVID-19
- Reporting of COVID-19 deaths - daily counts of deaths
 1. Can only increase
 2. No account of size of population (crude rate)
 3. No account of age structure of population (age-standardised rate)
 4. Impacts on different age groups (life expectancy)
- How do we – **decision makers, practitioners, public** - make sense of this?

Daily new confirmed COVID-19 deaths

Shown is the rolling 7-day average. Limited testing and challenges in the attribution of the cause of death means that the number of confirmed deaths may not be an accurate count of the true number of deaths from COVID-19.



Source: European CDC – Situation Update Worldwide - Data last updated 27th Jun, 10:52 (GMT+01:00), European CDC – Situation Update Worldwide
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Contrasting COVID-19 deaths with deaths due to inequality

- to **calibrate** the scale of **modelled mortality impact of COVID-19** using robust epidemiologic methods
 - life expectancy contribution
- against **socially-determined** causes of death

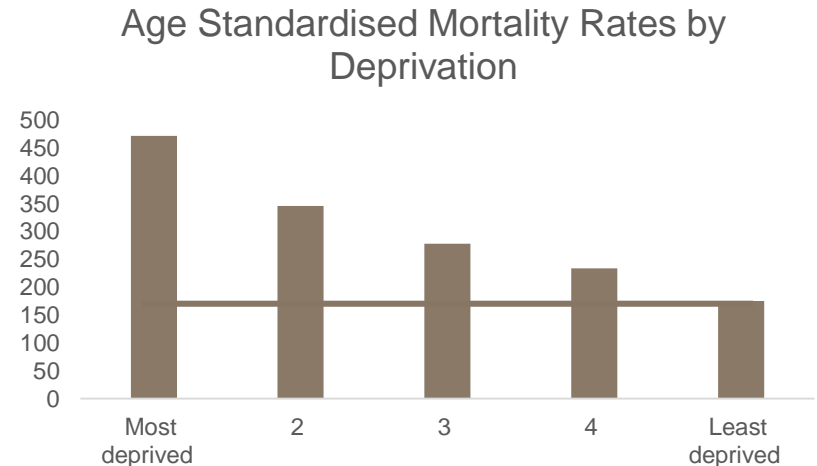


- <https://www.medrxiv.org/content/10.1101/2020.05.04.20090761v1>

Methods

- **Predicted COVID-19** deaths from Imperial College Model (March 2020)
 - Used by SAGE/UK Government
- Deaths due to **suicide, drug poisoning**
- **Inequality**
 - Excess deaths using death rate in least deprived areas (IMD, WIMD, SIMD, NIMDM)
- 5 year average - 2013-2017

- Age standardised mortality rates
- Impact on **life expectancy**



Crude Deaths

| Cause | UK | Scotland |
|--------------------------|----------------|---------------|
| COVID-19 unmitigated | 523,016 | 42,591 |
| COVID-19 fully mitigated | 20,510 | 1,670 |
| Drug poisonings | 4,460 | 850 |
| Suicide | 6,038 | 701 |
| Inequality-related | 147,346 | 17,150 |

Life Expectancy (years)

| Cause | UK | Scotland |
|----------------------|--------------|--------------|
| COVID-19 unmitigated | -5.96 | -5.26 |

Over a decade, inequality-related mortality impact on life expectancy equivalent to **6 unmitigated** COVID-19 epidemics

| | | |
|--------------------|--------------|--------------|
| Inequality-related | -3.51 | -4.73 |
|--------------------|--------------|--------------|

Implications



- Population health **is important at all times**
- Multi-agency approach **also** needed to reduce inequalities in mortality
 - Policies to address social determinants of health
- COVID-19 shows political and public support

Action plan for Inequalities – learning from COVID-19

- Follow the science
 - Don't let health inequalities be ignored
- INEQUAL2020
- Priority for population health needs realignment

Acknowledgements

Data

- National Records of Scotland (NRS)
- Office for National Statistics (ONS)
- Northern Ireland Statistics and Research Agency (NISRA)

Collaborators

- Gerry McCartney, David Walsh, Alastair H Leyland



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Additional References

SPHSU BLOG

Prioritising Population Health - Contrasting UK government responses to pandemic and inequality

https://www.gla.ac.uk/researchinstitutes/healthwellbeing/research/mrccsosocialandpublichealthsciencesunit/sharingourevidence/blog/headline_722762_en.html

Podcasts – 15 minutes on health inequalities

Mitigating adverse health effects of COVID-19 response

Mortality from social determinants vs COVID-19

<https://soundcloud.com/user-776545020>

SPHSU Research on COVID-19

<https://www.gla.ac.uk/researchinstitutes/healthwellbeing/research/mrccsosocialandpublichealthsciencesunit/aboutus/covid19/>