Geographical inequalities in COVID-19 mortality: a scoping review protocol

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Systematic Review

Keywords: COVID-19, Geographical Inequalities, Mortality

Posted Date: November 16th, 2021

DOI: <https://doi.org/10.21203/rs.3.rs-1086250/v1>

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Abstract

Objective

The objective of this scoping review is to understand what is known in relation to geographical inequalities in COVID-19 mortality.

Introduction:

COVID-19 has occurred against a backdrop of existing social and economic inequalities in health. The impact of the pandemic has been examined across various intersections of health inequalities such as age, gender, ethnicity, and occupation. However, spatial inequalities have been less explored. Therefore, this review aims to identify and synthesise what is known on geographical inequalities in COVID-19 mortality globally.

Inclusion criteria:

Following standard scoping review methodology the inclusion criteria will be guided by Population, Concept, Context (PCC). Population: children and adults (all ages); Concept: Area-level inequalities in COVID-19 mortality; Context: any country, at any level (neighbourhood, town, city, municipality, region). Any published, peer-reviewed study written in English that focuses on all three elements of the PCC inclusion criteria will be included.

Methods

Searches will be conducted in (host sites given in parentheses) Medline (Ovid), Embase (Ovid), Science Citation Index Expanded and Social Science Citation Index (Web of Science) and limited to dates ranging from 1st January 2020 to December 31st 2021. Reference lists of all relevant papers will be searched for additional studies. All titles and abstracts will be screened in Rayyan. Primary studies focusing on COVID-19 mortality rates disaggregated by any measure of area-level deprivation will be selected for full text review. Data relating to study design, population, location, outcomes, and results by deprivation will be extracted using standardised extraction forms. Identified papers meeting the inclusion criteria will be tabulated, synthesised thematically and a narrative constructed to describe the evidence base of geographical inequalities in COVID-19 mortality.

Introduction

The COVID-19 pandemic has occurred against a backdrop of existing social and economic inequalities in non-communicable diseases.¹ While the impact of COVID-19 has been examined across various intersectional dimensions of health inequalities such as age,^{2–5} disability,⁶ gender,^{7–10} race/ethnicity,^{5,9,11–16} sexuality,¹⁷ occupation,¹⁸ and socioeconomic status,^{16,19} geographical inequalities by area-level deprivation have been less explored. The links between place and health have been long established in the scientific literature,^{20,21} and pre-pandemic, geographical inequalities in health have been widely documented.²¹ In England, for example, healthy life expectancy varies by 21.5 years for women and 15.8 years for men between the least and most deprived local government areas - while even wider inequalities exist between smaller areas.²² Similarly, these localised inequalities in health are experienced in other high-income countries.²³ For example, the capital of the United States, Washington

DC, has a 20 year gap in life expectancy between low income and more affluent neighbourhoods.²¹ In Europe, regional north/south health inequalities persist in Italy²⁴ and Spain,²⁵ and some of the highest regional inequalities are found in France, Germany, the United Kingdom, and Austria.²⁶ There are also notable geographical inequalities within low- and middle-income countries. For example, in the Thiruvananthapuram district in Kerala India, life expectancy is around 2-3 years longer among those from high income households compared to those living in more deprived circumstances.²⁷ Poorer health outcomes are also documented among people living in disadvantaged circumstances in Malawi, South Africa, Swaziland, Zambia, and Zimbabwe compared to their more affluent counterparts.²⁸ Given these large inequalities in health were prominent pre-pandemic we sought to examine whether COVID-19 mortality rates demonstrated similar geographical patterns. Research in England, for example, has found large regional inequalities with much higher rates of COVID-19 deaths in the more deprived northern regions.²⁹ However, there has been no overview of whether such geographical inequalities are present across different countries, in different stages of the pandemic or at different spatial scales. Therefore, this scoping review will identify primary studies across the globe and examine what is known to date on geographical inequalities in COVID-19 mortality rates.

Methods

We followed the Preferred Reporting Items for Systematic review and Meta-Analysis Protocols (PRISMA-P) checklist to develop this protocol (see Appendix 1).³⁰

Research question

What is known on geographical inequalities in COVID-19 mortality?

Study design

Scoping review methodology will be used to identify and synthesise published evidence on geographical inequalities in COVID-19 mortality rates. The review will follow established guidelines for the conduct and reporting of scoping reviews^{31–34} and adhere to the Preferred Reporting of Systematic Reviews extension for Scoping Reviews (PRISMA-ScR).³⁵

Inclusion criteria

Following standard scoping review approaches the inclusion criteria will be guided by the PCC mnemonic; Population, Concept, Context (PCC).^{31,32} Only published, peer-reviewed studies written in English will be included.

Population: *Children and adults (all ages).*

Concept: *Geographical inequalities in COVID-19 mortality within countries*

Context: *Any country at any level (neighbourhood, town, city, municipality, region).*

Search strategy

The Preferred Reporting Items for Systematic Reviews extension for Scoping Reviews (PRISMA-ScR)³⁵ guidelines will be followed throughout the design, conduct, and reporting of this review. Following Peters et al (2021)³² an initial limited pilot search of Social Science Citation Index (Web of Science) will be conducted followed by an analysis of text words contained in the titles and abstracts in addition to the index terms describing each article (see Appendix 2 for pilot search terms). A second search using identified keywords and index terms will then be undertaken across the following key health inequality-related research databases (host sites given in parentheses): Medline (Ovid), Embase (Ovid), Science Citation Index Expanded and Social Science Citation Index (Web of Science). Reference lists of all relevant papers will be searched for additional studies and forward citation chaining will also be conducted. Publications will be limited to 1st January 2020 to 31st December 2021 reflecting the first two years of the COVID-19 pandemic. Four key articles known to the authors that met the inclusion criteria were identified to ensure the sensitivity of the searches across different scales (see **Table 1**).

Table 1: Sensitivity papers	
Reference	Retrieved in pilot searches
Chen & Krieger (2020) Revealing the Unequal Burden of COVID-19 by Income, Race/Ethnicity, and Household Crowding: US County Versus Zip Code Analyses. ³⁶	Yes
Calderon-Larranaga et al (2020) High excess mortality in areas with young and socially vulnerable populations during the COVID-19 outbreak in Stockholm Region, Sweden. ³⁷	Yes
Gonzalo et al (2021) Socioeconomic status determines COVID-19 incidence and related mortality in Santiago, Chile. ³⁸	Yes
Griffith et al (2021) Interrogating structural inequalities in COVID-19 mortality in England and Wales. ³⁹	Yes

Screening

All titles and abstracts will be screened, using Rayyan QCRI (<https://www.rayyan.ai/>), by VJM and relevant papers will be retrieved and assessed for inclusion. Any ambiguous studies will be referred to CB for assessment. Studies will be excluded if they do not draw on empirical quantitative data. A flow chart of the selection process will be produced following PRISMA guidelines.⁴⁰

Study selection

Table 2: Inclusion/exclusion criteria	
Inclusion	Exclusion
1. The publication is a peer reviewed empirical study published in English.	1. The publication is a conference proceeding, editorial, letter, comment, erratum, survey, note or a doctoral thesis; or does not meet one or more of the key elements of PCC (population, concept, context).
2. The publication focuses on COVID-19 mortality rates.	2. The publication focuses on COVID-19 hospitalisations, incidences, cases, symptoms/severity, or infection rates.
3. The publication disaggregates COVID-19 mortality rates by measures of area deprivation.	3. The publication does not include COVID-19 mortality disaggregated by an area measure of deprivation.

Data extraction

Data relating to study design, population, location, outcomes, and results by deprivation will be extracted from full-text versions of included studies using standardised extraction forms (see Appendix 3).⁴¹ As is customary with scoping reviews (given their focus on establishing the evidence base as opposed to providing answers to clinically or policy-focused questions), a formal assessment of study quality and risk of bias will not be undertaken.^{31–33}

Synthesis

Identified papers meeting the inclusion criteria will be tabulated, synthesised thematically and a narrative constructed to describe the evidence base of geographical inequalities in COVID-19 mortality at different scales.

Discussion

This review will provide a summary of the evidence base on geographical inequalities in COVID-19 mortality combined with a theoretical discussion to explain this relationship drawing on the geographical literature on health and place.⁴² Additionally, it will discuss the research and policy implications of these spatial inequalities both during the pandemic phase and as the disease becomes more endemic.

Declarations

Author contributions

CB and VJM conceived the study idea and developed the study methodology. VJM led writing up with input from CB. VJM will conduct the literature searches with support from CB. VJM will screen identified literature and conduct data extraction. CB will act as a second reviewer in the event of ambiguity. CB and VJM will analyse and synthesise the findings. Both authors read the draft, provided comments, and agreed on the final version of the protocol.

Funding

CB is funded by the Health Foundation (grant reference number 2211473). CB and VJM are funded by the National Institute for Health Research (NIHR) School for Public Health Research (Grant Reference Number PD-SPH-2015). CB is also a senior investigator in ARC North East and North Cumbria (grant reference NIHR200173). The views expressed in this publication are those of the author(s) and not necessarily those of the National Institute for Health Research or the Department of Health and Social Care.

Conflicts of Interest

The authors report no conflicts of interest.

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