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# Falling down the rabbit hole? Methodological, conceptual and policy issues in current health inequalities research

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## ABSTRACT

Persistent health inequalities pose a challenge to researchers and policy-makers. Decades of research have illuminated mechanisms that underlie health inequalities, now we must move beyond these observations to enable policies that can reduce them. In this paper, we highlight tensions in the field of health inequalities research regarding the relationship between social determinants and health outcomes, and the effectiveness of welfare policies. We draw on recent evidence to analyse and discuss these areas of debate and provide insight into the evidence on causality, welfare systems and policies aiming to address the social determinants of health inequalities. First, we examine the evidence that inequalities in the social determinants of health are causally related to health inequalities. Second, we discuss whether more egalitarian social policies provide a solution to redressing health inequalities. In conclusion, we suggest that current debates around causal understandings risk sending the field down 'rabbit holes' that distract from solution. We argue that, if we combine epidemiological evidence with the broader canon of social science evidence, the case for causal inference is sufficiently strong to suggest we now need to focus on effectively supporting and promoting research-informed policy responses to health inequalities.

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## Introduction

Observed differences across a wide range of health measures, based on social and economic characteristics, are a stark reminder of the unequal nature of our societies. Defined as 'systematic, avoidable and unfair differences in health outcomes that can be observed between populations, between social groups within the same population or as a gradient across a population ranked by social position' (McCartney, Popham et al., 2019), these health inequalities pose a challenge to researchers and policymakers alike. After decades of research examining the causal mechanisms that underlie these inequalities, it is incumbent upon us to move beyond these observations and

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explanations, working to employ what we know about the underlying mechanisms and pathways which produce health inequalities to contribute to the development of policies that are effective in reducing them.

While the field of health inequalities research has grown, so too have health inequalities, with most European and North American countries experiencing increases in relative health gradients and many experiencing increases in absolute health gradients (Cantu et al., 2021; Elgar et al., 2015; Mackenbach et al., 2015, 2018; Shahidi et al., 2020). From 2012–14, life expectancy improvements in many high-income countries have stalled, due to slowing improvements in the most disadvantaged groups (Marmot, 2020), including in England, previously hailed as an international leader in efforts to reduce health inequalities (Mackenbach, 2011).

In this work, we will acknowledge current tensions in the field of health inequalities research. In the context of rising levels of social and health inequality there remains scepticism of the evidence on the causal relation between social inequalities and health inequalities, and the social policy solutions to address them (Mackenbach, 2020). The field of health inequalities deals with a wide breadth of social and health-related questions. It also aims to address the mechanisms through which socially patterned health outcomes are formed. Our paper attempts to address issues affecting this broad field as a whole regarding two main points and provides several illustrative examples. We will discuss the criticisms made of these bodies of research and argue that when the broader canon of evidence from the social sciences is included it provides a rationale for clear causal inference and policy action.

Debates in health inequalities research often return to questions of causality and the nature of the scientific evidence (Eikemo & Øversveen, 2019; Schrecker, 2013). Many researchers in this field are convinced that health inequalities 'are real, that they are morally and politically unjustifiable, and that they are caused by the general cultural, social and economic organization of our societies' (Eikemo & Øversveen, 2019). Others, such as Mackenbach (2020) suggest, 'that there is surprisingly little robust evidence that the correlation between socioeconomic inequalities and health inequalities is causal', noting that 'progress in reducing health inequalities has been disappointing' (Mackenbach, 2020). We submit that engaging in continued debate about the causes and solutions to health inequalities may give reason to those in policy and political roles not to act, when in fact there is sufficiently robust evidence to take action now.

Health inequalities research is diverse and multidisciplinary, involving two broad sets of scientific evidence with which readers of this journal may be familiar. One set includes research describing or problematising absolute or relative health inequalities, and studying potential mechanisms underlying inequalities. The other set of evidence focuses on, understanding and assessing the effectiveness of solutions to redress health inequalities. There is good quality evidence that policies can effectively reduce inequalities (e.g. the 'English strategy' during the Labour governments of 1997–2010), and also that reducing social protection comes with very real human costs, such as the excess deaths attributed to austerity policies (Rajmil & Fernández de Sanmamed, 2019; Toffolutti & Suhrcke, 2019).

Our purpose is to challenge recent claims that research on health inequalities lacks sufficient evidence on causality. It is our contention that there is in fact extensive evidence showing that social inequalities cause health inequalities, if we consider the full breadth of research in the field. There is also a robust evidence base of policy actions that are likely to reduce health inequalities. However, debates about causality persist because some in the field advocate taking what we consider to be an overly narrow approach to the methods that can contribute to understanding and assessing causal relationships between social and health inequalities. This narrowing diminishes the value of a body of observational evidence, and misses the importance of triangulation in understanding causality. While comprehending mechanisms is necessary, defining the methodologies that enable us to study causal pathways too narrowly risks restricting the types of research questions asked and distracting attention from what we already know about the causal factors that lead to rising or falling health

inequalities within different societies at different times. Such a narrowing may lead researchers to expend effort chasing down intellectual rabbit holes, such as genetic determinism or selection theories.

### ***What is the evidence that inequalities in the social determinants of health are causally related to health inequalities?***

A growing body of evidence from econometric and quasi-experimental studies demonstrates causal links between inequalities in social determinants of health and inequalities in health outcomes (Lee, Schram, et al., 2018). For example, Wickham et al. (2020) used a difference-in-differences analysis on observational data to show a causal relationship between the roll-out of Universal Credit and increased socioeconomic inequalities in mental health in England (Wickham et al., 2020). Universal Credit and other welfare reforms led to significant loss of income, especially among the poorest households, ethnic minorities, single-parents, and people with disabilities (Equality and Human Rights Commission, 2018). A systematic review examining the relationship between household financial resources and children's outcomes (cognitive, behavioural, and physical health), included many quasi-experimental studies, and reported overwhelming evidence for positive effects of income or assets on children's outcomes (Cooper & Stewart, 2017). Such studies may meet the criteria for narrowly defined 'rigorous analytic methods' (Mackenbach, 2020), if we take this to mean studies with causal identification strategies that minimize the potential for confounding via unobserved heterogeneity across subjects and endogeneity of treatments.

However, assertions about the nature and strength of evidence deemed to be rigorous deserve to be critically examined. In light of the emerging causal evidence of a link between social determinants and health equity, our concern is that health inequality researchers, who operate in a multidisciplinary field employing a wide variety of methods, might accept this definition of causal approaches without considering its underlying basis. The 'correct way' to assess causality is a subject of philosophical debate (Mumford & Anjum, 2013) and the epistemological beliefs underlying the views regarding causal rigor are not widely shared across the disciplines contributing actively to health inequalities research (Collyer & Smith, 2020). Health inequalities researchers accustomed to assigning a causal interpretation only to the results of randomized controlled trials or experimental evaluations of policy implementation, may share the fallacious belief that anything short of this 'gold standard' raises concerns. However, researchers from disciplines concerned with structural, political economy or lifecourse determinants of health inequalities employ distinct approaches to establish causality. Indeed, articles making causal claims based on systematic reviews of mainly observational studies (Bambra et al., 2010; Pickett & Wilkinson, 2015) are widely cited, and contribute to a diverse body of evidence on causal links between socioeconomic factors and health outcomes. Schrecker (2013) argues that defining evidence from experimental or quasi-experimental studies as a standard of proof for action on the social determinants of health is in fact a political and ethical choice rather than a scientific one (Schrecker, 2013), despite often being presented as the latter.

Across the social sciences, there is growing recognition that robust causal inferences can be drawn from a variety of methods and research designs. For example, insights from qualitative research can play an important role in developing our understanding of causal pathways (Mackenbach, 2014). Observations derived from process tracing (Collier, 2011) and data drawn from qualitative studies of community experiences and perspectives (Di Monaco et al., 2020; Smith & Anderson, 2018) may also yield leverage on understanding the mechanisms and contexts (Falletti & Lynch, 2009) that underlie causal processes in public health. Not only do many researchers regard such research techniques as rigorous in their own right; when combined with the extensive observational evidence that links socioeconomic deprivation and inequality to health inequalities, they are likely to do far more than large, econometric studies to explain *why* and *how* socioeconomic inequalities produce health inequalities (Lorenz et al., 2014). Yet much research within the biomedical field fails to account for the power of triangulation in assessing causality (Munafa & Davey

Smith, 2018). A singular research design, method or approach cannot provide a definitive answer to a causal question, while drawing from multiple viewpoints can help neutralise the design flaws of any one study (Hammerton & Munafò, 2021). When different investigators, using different data, methods and theoretical frameworks, in different contexts, converge on similar findings, we can take greater confidence in our assessments. The ability to triangulate is critical for research into health inequalities, because social determinants cannot be understood as individual exposures. For this reason, it is widely accepted that health inequalities researchers need to embrace a plurality of research methods (Garthwaite et al., 2016; Glymour & Hamad, 2018; Vandenbroucke et al., 2016).

A profusion of recent studies analyses genetic contributions to complex social traits such as cognitive ability, education, social isolation, antisocial behaviour (Adam, 2019). Some work centres on supposed genetic causes as either causes of health in their own right, or key confounders in the relationship between social determinants and health (Batty et al., 2021; Deary et al., 2019). However, the use of genetics to study causality in the field of health inequalities risks conflating the causes of cases with the causes of prevalence and inequalities (Rose, 2001). Genetic epidemiology can provide insight into which individuals are impacted most within a population, given a particular socio-economic context, but adds little to understanding why health and health inequalities change over time. There is also a tendency to decontextualize genetic causes from their causal environmental interactions, leading to a narrative of genetic essentialism (Dar-Nimrod et al., 2021). For example, a genome-wide association study of education in a large sample of individuals, reported identifying polygenic scores that explained 11–13% of the variance in education and 7–10% of the variance in cognitive performance (Lee, Wedow, et al., 2018). Despite the authors' attempts at moderating the interpretations of their work, the ensuing media attention contained alarming, causal interpretations (Altmetric, 2018), including the headline: 'A new way of predicting which kids will succeed in school: Look at their genes' (NBC News, 2020).

Studies finding genetic associations in samples of unrelated individuals are often perceived as confirmation that genotypes cause phenotypes, when in fact these estimates can arise from indirect mechanisms due to population stratification, dynastic effects, and assortative mating (Morris et al., 2020). Such biases are likely when genetic data are used in relation to phenotypes that are complex social or socioeconomic variables. Inferring from such results that socio-economic position may be genetically determined is therefore inaccurate. It is surprising to focus exclusively on genes and to ignore the way in which gene expression, and ultimately biological functioning, is influenced by the social environment (Hertzman & Boyce, 2010; McGuinness et al., 2012). Evidence suggests that genes are more likely to explain health inequalities via interactions with the environment. Finally, genetic explanations cannot account for the fall and rise in inequalities in mortality over the 20th Century (Krieger et al., 2008; Thomas et al., 2010) and thus add little to the task of reducing health inequalities in the future.

The dynamic and pervasive nature of social structures and their indirect effects upon individuals across the lifecourse explain why research on health inequalities requires methodological tools that accommodate the complexity of causation. Many health inequalities studies have used income, education and occupation as pragmatic markers of socioeconomic position to rank populations and measure the size of health inequalities. However, this has become conflated with using these markers as representing comprehensive and valid measures of key socio-economic exposures and relationships (McCartney, Bartley et al., 2019). As Lundberg (2020) argues, health inequalities research needs to look beyond the direct effects of these three indicators (Lundberg, 2020). These three indicators of social position can affect health through multiple mechanisms and so require evaluations that can capture multiple indirect and mediated causal pathways. The effects of inter-meshed structural determinants such as gender, race/ethnicity and class defy narrow definitions of causal inference. They are organizing structures of society that pervade everyday experiences and influence political access, equality, and justice (Hancock, 2007), exerting pressure differently at different times and within different contexts.

Complex causation lends itself poorly to analysis solely via methods that require clearly defined and time-delimited exposures. When assessing the contributions of multiple research types for establishing causality, there is substantial evidence that acting on the distribution of upstream/midstream social determinants of health may indeed help to reduce inequalities. Given the difficulties in undertaking experimental studies on interventions to improve health equity, our view is that the evidence of causal impacts of socioeconomic factors on health inequalities is sufficiently robust to support policy action. Moreover, there are many other reasons to want to ensure, for example, that a population has access to good quality housing and education and that wealth is more equally distributed. Seeking the ‘perfect’ evidence in this context is likely to have disastrous results. As Greenhalgh (2020) recently argued in the context of COVID-19, “in a complex system, the question [that should be] driving scientific inquiry is not ‘what is the effect size and is it statistically significant once other variables have been controlled for?’ but ‘does this intervention contribute, along with other factors, to a desirable outcome?’ ” (Greenhalgh, 2020).

### ***Are egalitarian social policies the solution to redress health inequalities?***

Those who raise questions about causality and the social determinants of health often refer to the ‘Nordic Paradox’ – the suggestion that social inequalities in health are not smaller in countries with more advanced welfare states (e.g. Nordic). This debate stems from a 1997 paper concluding that, despite strong commitments to egalitarian welfare policies, Scandinavian countries had larger socioeconomic inequalities in health than other Western European countries (Mackenbach et al., 1997). This finding was subsequently challenged for considering only relative and not absolute inequalities (Vågerö & Erikson, 1997). Both the ‘Nordic Paradox’ and whether to use relative or absolute inequalities continue to elicit debate. The paradox raises three important questions:

- (i) Are there any omitted social determinants of health that are not recognised and or addressed by ‘advanced welfare states’?

Arguably the classification of welfare state types often used is narrow and ignores the importance of, for example, education and corporate regulation (Smith et al., 2015). Yet health-related behaviours, work and environmental exposures are clearly socially distributed, even in countries with advanced welfare states (Bambra & Eikemo, 2009; Dragano et al., 2010), and we know that policies promoting individual responsibility for health related behaviours, or relying on high levels of individual agency to benefit (Adams et al., 2016), tend to have unequal impacts (Lorenz et al., 2013). This suggests health inequalities research needs to engage directly with research on the commercial and environmental determinants of health (Smith et al., 2015). Similarly, advanced welfare states have not been consistently strong in implementing broader policies protecting and promoting health across all groups, such as child and adolescent welfare, work-place protection, gender and immigration policies (Hvinden, 2011). Since all of these fundamentally shape health, and vary by geo-political context, research seeking to understand the impacts of state policies on health must take them into account and analyses that focus solely on the impacts of health policies or treat advanced welfare states as a homogenous group have substantial limitations.

- (ii) Are social inequalities in health larger in more ‘advanced welfare states’?

The claim that social inequalities in health are not smaller in more advanced welfare states requires examination. This has long been claimed in comparative public health research (Bambra, 2011) and whilst absolute and relative inequalities do not tend to be smaller, there are other issues to consider. Advanced welfare states fare best in terms of average population health outcomes (life

expectancy of all social groups tends to be higher) and in terms of ‘total mortality’ (Popham et al., 2013) everyone does better (Wilkinson & Pickett, 2009). Taking the case of mortality amongst middle-aged men in Sweden, Lundberg and Lahelma (2001) comment that:

On the basis of relative risk it would be possible to draw the conclusion that more than half a century of egalitarian policies have failed, since inequalities in mortality among middle-aged men are as large in Sweden as elsewhere in Europe. This sort of simplistic conclusion would ignore the fact that Swedish working class men have extremely good survival rates compared to similar men in other European countries, which in turn may very well result from the wide range of welfare state policies implemented since the 1930s. (Lundberg & Lahelma, 2001, p. 64)

The life expectancy of all socio-economic groups is higher than the equivalent groups in other countries, and premature mortality risks are also lower (especially in Norway and Sweden). Research has also shown that the most vulnerable social groups – the elderly (Avendano et al., 2009), the sick (Van der Wel et al., 2011), and children (Zamboni et al., 2006) – fare better in more generous welfare states and higher social expenditure on welfare has health benefits for the least educated (Dahl & van der Wel, 2013). The scale of social deprivation, who experiences the worst health, also varies by country and type of welfare regime. For example, the lowest educated groups in countries with ‘social democratic’ welfare systems amount to around 15% of the population as opposed to 38% of the population in some countries with ‘liberal’ welfare systems (Guarnizo-Herreño et al., 2013) – more people therefore experience the sharp end of health inequalities in England than in Sweden.

(iii) Is the social protection afforded by ‘advanced welfare states’ equally accessible to all residents or does this vary by social group, time and/or welfare state?

Finally, point three assumes a static, ahistorical understanding of advanced welfare states – ignoring how *all* welfare states have shifted radically in nature over the last few decades (Schrecker & Bamba, 2015): Denmark, Finland, Norway and Sweden have not been immune to the processes of globalisation, neoliberalism and welfare reform resulting in rising social inequality (Bamba, 2013). For example, the generous and encompassing income protection provided by the Nordic welfare states has reduced in value over time. For example, in Sweden the value of unemployment benefits has fallen from around 90% of the average wage in 1990s to 60% today (Farrants et al., 2016) and income inequalities have risen in these countries – just as they have in others. When the Nordic welfare states were at their most expansive (e.g. the 1970s), income and health inequalities were smaller there than in other European countries – but their relative advantage over other countries has declined over time as they have also pursued shifts towards neoliberal social and economic policies (albeit to a lesser extent; Schrecker & Bamba, 2015). One of the main issues in the retrenchment of the Nordic welfare model has been the exclusion of new population groups – most notably immigrants – from full welfare state support (Kvist et al., 2011). Migrants are usually entitled to lower-value benefits compared to social insurance benefits available to full citizens. This insider-outsider basis matters since, in studies of health inequalities, migrants are usually positioned in the lowest occupational and income groups.

## Conclusion

We have engaged with recent debates in health inequalities research, examining the disputed evidence around causality, policy solutions and measurement. We have set out that these debates may lead the field down ‘rabbit holes’, diverting resources. Regarding the question of causal relationships between social variables and health outcomes, we argue in favour of a more methodologically inclusive approach to evidence that can inform causal assessments of the social determinants of health. We refute flawed arguments often used to support the call for specific and

narrowly defined causal approaches. We dispute that egalitarian policies have failed to redress health inequalities by highlighting the multiplicity of policies that have (and have not) been implemented in advanced welfare states.

Health inequalities are, by definition, 'unjust and avoidable' (Whitehead, 2007) but if the available body of work is not considered on its merits the policies and practices that evidence suggests are most likely to reduce health inequalities are less likely to be implemented. Policymakers are influenced by expert views and they are more likely to stop short of implementing radical policy change, where the evidence base for such changes is contested by credible academic sources. Indeed, precisely such a strategy has been employed by corporations seeking to prevent tobacco control and climate change policies (Grüning et al., 2006). It is therefore incumbent on experts to represent available research judiciously. If left unchecked, such debates have the potential to undermine the credibility of evidence regarding both the causality of social determinants and the likely efficacy of key policy responses. In turn, this could result in substantial and unnecessary mortality and morbidity, disproportionately impacting the most disadvantaged members of our societies. In the face of present and future global emergencies, efforts to reduce relative and absolute inequalities should be reinforced given the growing burden placed on those in society who have been rendered most vulnerable.

The important insights provided by epidemiological methods need to be combined with insights from other disciplines. This includes economics, where relevant expertise can provide insights into the potential implications of shifts in macro-level economic policy (McCartney, Popham et al., 2019) and, unpack blended concepts such as 'socioeconomic status', which sometimes obscure as much as they reveal. We also include political science and policy studies, which can provide a better understanding of the relationships between political systems and health inequalities (Beckfield & Krieger, 2009) and garner insights into the ways in which different actors all work to influence policy (Smith et al., 2015). Qualitative social science captures the complexity of people's lived realities (Smith & Anderson, 2018) and key insights on inequality come from this kind of qualitative research, which portrays lived experience of the causes and effects of inequalities. Qualitative researchers have begun employing dialogue-based methods to provide spaces in which researchers, publics and policymakers can have productive interactions about potential responses and solutions to health inequalities (e.g. Smith et al., 2021). It is perhaps only by combining such insights with existing epidemiological evidence that we will understand how to effectively support and promote research-informed policy responses to health inequalities.

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