

Research Paper

Theories of population health: A review of pictorial models and a proposal for the Political Economy and Health model

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The current global polycrisis, and the threats it poses for population health, demands theory which moves beyond social, commercial, environmental or political determinants of health. By synthesising the strengths of existing models into a political economy framework, it is possible to better integrate the links, propose causal pathways, and more effectively incorporate relational theories of power and social class. How we theorise and understand the causes of population health influences how it is prioritised, the research questions asked, the recommendations made, and who is held responsible for it. In this paper we review notable pictorial models of population health in order to identify their common and divergent features, and to expose the underlying assumptions, values and implications of each. Each model is critically assessed for the extent to which they provide a causal flow and include a sufficient range of exposures and social processes. Building on their pre-eminent features, and incorporating theories of health and political economy, power, and social relations, we propose the 'Political Economy and Health model' to improve the potential for public health policy, practice and research to be less complacent and more transformative in the face of 21st Century challenges.

Introduction

The urgent challenges presented by the global polycrisis (WHO 2021), and the associated changes in many health trends (Ho & Hendi 2018, Walsh & McCartney 2025), demand a theory of population health to help us respond (Krieger 2014a). How the causes of population health¹ are theorised and understood influences the priority it is accorded, what research questions we ask, what recommendations we make, and ultimately who is held responsible for it.

¹ Population health here is understood as the mean and distribution of, and inequalities in, health within a society (McCartney, Popham et al. 2019).

In this paper we review theories of population health, focusing on leading pictorial models,² to identify their common and divergent features, and to interrogate the underlying assumptions, values and implications of each. We examine each model against a series of criteria designed to foreground political economy exposures and processes. Following this, we propose the *Political Economy and Health model*. This synthesises the pre-eminent features of the existing theories and addresses gaps in these models. We aim to move beyond overly simplistic conceptions of the ‘social’, ‘commercial’, ‘environmental’, or even ‘political’, determinants of health, which risk decontextualising and siloing our understandings of the systemic inter-relationships of population health determinants across all aspects of political economy. In so doing, we support recent calls to focus on the ‘structural’ determinants of health (Heller et al. 2024), and expand upon previous work which theorises how social class (McCartney, Bartley et al. 2019), power (Friel et al. 2021, McCartney et al. 2021) and political economy (Harvey 2021, Heller et al. 2024, Lynch 2020, McCartney, Hearty et al. 2019) impact on population health. In making our case, we describe ‘political economy’ as understanding:

[T]he economy as a complex evolving system in which individuals, populations and organisations attempt to address their needs, wants and aims. The economic system is shaped by historical and geographical contingencies, power relations, culture, values, legal systems and ecology. The economy is, therefore, seen as embedded in society and partially reflective of prevailing social values (McCartney et al. 2022, p. 519).

In the following section, we summarise the development of population health theories and models. Next, we describe and assess the merits of seven important models in the literature which are relevant to a political economy understanding of population health: Dahlgren and Whitehead (1991), Solar and Irwin (2010); Navarro (1977); Navarro et al. (2006); McCartney et al. (2019); Krieger (2020); and Breilh (2021). Finally, we propose the *Political Economy and Health model* and discuss its properties and possible limitations.

Population Health Theories and Models

Population health theories have a long history, leading to a wide range of actions being taken in different societies over many centuries, including the provision of clean water, agricultural practices to create more reliable food sources, and better care of the sick and dead (Floud et al. 2014). Scientific breakthroughs in the 19th Century established specific causes of illness and mortality, as well as greater discussion of the role of economic and social circumstances in determining the health of populations (Virchow 1848). Population health theory and action developed in four ‘waves’: structural interventions (e.g. water, sewerage), biomedical (e.g. antibiotics and vaccines), behaviours (e.g. smoking and exercise), and social determinants (e.g. housing, employment) (Davies et al. 2014, Hanlon et al. 2011). The framing of the social determinants of health has been supplemented more recently by articulation of commercial (Gilmore et al. 2023), environmental (Rabinowitz & Barry 2024), and political determinants of health (Dawes et al. 2022, Heller et al. 2024).

The Black report was seminal in identifying and critically appraising four causal theories of health inequalities³: artefact, selection, behavioural/cultural and structural. The report was clear that the available

² We interpret theory as an attempt to provide a causal explanation of complex reality which is simplified and aims to draw a generalisable insight. Pictorial models are a form of theorisation, but one which utilises diagrams as a means of communication.

³ Defined as the ‘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, p. 22). Note that the use of ‘health inequalities’ in this way, in this article, is equivalent to how ‘health inequity’ is commonly understood amongst North American scholars (Braveman 2022).

evidence best supported structural theory and, following from this conclusion, a range of policies to equalise the socio-economic circumstances in society were proposed (Black *et al.* 1988), thereby placing ‘political economy’ at the heart of explaining population health (Doyal & Pennell 1979, Harvey 2021, Lynch 2020). The evidence for this structural explanation has only strengthened over time (Bambra & Marmot 2023, Walsh & McCartney 2025, WHO 2008).

The importance of political economy for understanding health has increasingly been recognised, with a large number of studies examining the impacts of historical and geographical contingencies, institutions, welfare states, politics, policies, economics, power relations, culture, values, legal systems and ecology (Beckfield & Krieger 2009, Breilh 2021, Doyal & Pennell 1979, Harvey 2021, Heller *et al.* 2023, Lynch 2020, McCartney, Hearty *et al.* 2019).

Some of this research has focused on whether and how public services are provided, the extent to which incomes are protected, and regulations in the labour market, often encapsulated through welfare state typologies (Bambra 2011). Other strands have focused on the impacts of particular economic approaches such as ‘neoliberalism’ and austerity (Basu *et al.* 2017, Collins *et al.* 2016, Walsh & McCartney 2025), or the role of corporations (framed increasingly as the ‘Commercial Determinants of Health’) (Gilmore *et al.* 2023). Social class and power theories have increasingly been applied in population health analyses, as will be discussed below in relation to pictorial models (Friel *et al.* 2021, Harvey 2021, McCartney, Bartley *et al.* 2019, McCartney *et al.* 2021, Muntaner *et al.* 2002, 2015, Navarro 1977). Link and Phelan have focused attention on how the distribution of the ‘fundamental causes’ (income, power and resources) determines the scale of health inequalities irrespective of the presence or mitigation of linking mechanisms (Link & Phelan 1995, Phelan *et al.* 2004, 2010). More fundamentally, some have argued that capitalism, and particularly economic growth (Brook *et al.* 2024), is not a route to population health improvement because the social processes inherent to it are key causes of health problems (Doyal & Pennell 1979, pp. 12–13, 23) and endanger the climatic stability of the Holocene upon which all health is dependent (McCartney, Büchs *et al.* 2025, Noonan 2024).

This work aims to critically evaluate candidate political economy and health theories encapsulated as pictorial models to use their foremost features in developing a theory-based model which can provide insight to the political economy drivers of population health in the current polycrisis.

Methods

We purposively selected seven pictorial models of population health for critical appraisal from the wide range available (Buse *et al.* 2023, Rahman *et al.* 2024). They were selected because of their common use (Dahlgren & Whitehead 1991, Solar & Irwin 2010) or because they specifically engage with the challenges of integrating important aspects of political economy theory (Krieger 2020, Breilh 2021⁴, Navarro 1977, Navarro *et al.* 2006, and McCartney, Bartley *et al.* 2019). We note explicitly here that the included models were not necessarily designed for the purposes we are interested in, and that the surrounding text for the models may address the limitations we identify. As such, our critique should not be taken as a criticism of the authors’ viewpoints or contributions. However, we argue that models are at lowest risk of misinterpretation when they can stand alone, not least because they can develop a life of their own once published (Dahlgren & Whitehead 2021). We therefore assess them as stand-alone diagrams.

Each model was examined to assess: 1. Whether it offered a clear causal flow between exposures; and 2. The extent to which the model included a sufficient range of exposures and social processes.

We deemed the presence of causal flow between exposures to be important for several reasons. First, without this, factors can be described without a clear indication of whether or how they are linked, or the direction of effects. Second, it aids the readability of models by indicating where to begin and end.

⁴ We were unable to obtain permission to reproduce Breilh’s (2021) model.

Third, for policymakers, it helps clarify where interventions and changes can be made if different population health outcomes are sought. Fourth, for researchers, it assists in building causal diagrams and in understanding the positioning of potential mediators, confounders, effect modifiers and colliders. We also considered specifying the presence of feedback loops in the assessment to recognise the importance of systems in political economy, but decided against making this a specific criteria to avoid over-specification.

The exposures and social processes were defined as most of those characteristics set out by Krieger (2011, p. 166) for judging social-epidemiologic theories, supplemented by three additional aspects relating to: social class and discrimination (McCartney, Bartley et al. 2019, Muntaner et al. 2015); power relationships (Friel et al. 2021, McCartney et al. 2021); and differential vulnerability (Diderichsen et al. 2019). Of Krieger's (2011, p. 166) characteristics, the following were included: political, economic and social production and reproduction of society; politics, politics and social movements; social determinants; psychosocial exposures; biological pathways of embodiment; exposure across the lifecourse; levels (from global to microscopic); spatiotemporal scale; history and historical contingency; and ecosystem. We excluded 'usefulness as a means for further research and understanding population health' on the basis that this was too close to the overall purpose of this exercise and could not be judged independently of the particular characteristics of the models. We also excluded the 'reflexivity of theory and theorists' (Krieger 2011, p. 166) on the basis that this was something we could not judge effectively, and we were unclear whether this was a relevant criterion for the efficacy of the model.

We included social class processes, the processes of discrimination, and power relationships, on the basis that it is difficult to understand health inequalities in any given population without an understanding of these social processes as relational between social groups (Darity 2022, Friel et al. 2021, Heller et al. 2023, 2024, Krieger 2014a, McCartney et al. 2021, Muntaner & Gunn 2019, Navarro 1977, Phelan et al. 2010, Wright 2015). We also included the concept of differential vulnerability across populations to recognise that even where exposure across populations might be even, the impacts can be unequal because of what epidemiologists call effect modification, and statisticians call interaction effects. Diderichsen et al. (2019, p. 270) use vulnerability to encapsulate differential exposure, susceptibility and capacity to respond, and we adopt that here. In our view, differences in susceptibility and capacity themselves relate to differential exposure to other factors, but separating out vulnerability is useful because it can inform research and policy which might be concerned only with some of the relationships of interest.

We describe each of the chosen models and assess them against these criteria, drawing out their key strengths and weaknesses. The assessments were first made by one author and then discussed and agreed by all authors, and are intended as a general summary of the narratives rather than strict scores or assessments. Building upon the strengths of each and the criteria we set out, we then propose the *Political Economy and Health model* as our tentative proposal to meet as many of the criteria as possible whilst retaining sufficient simplicity and readability. This builds upon earlier versions of this model (McCartney 2022) and as adapted to discuss the potential health impacts of alternative economic futures (McCartney, Büchs et al. 2025).

We recognise our positionality in relation to this work. This work was originally developed as part of a PhD thesis (for the lead author, with the other authors as supervisors) which sought to understand changing life expectancy trends and the role economic policy might have played as the principal causal factor. There is the risk with a thesis that it becomes an overvalued or fixed set of findings compared with other work, given its conflation with academic identity. To counter this, it is worth noting that the model has evolved markedly in the light of repeated rounds of constructive feedback. This paper also identifies, develops, and critiques the work of world-leading scholars, and this is a daunting prospect. We hope that our criticisms are sufficiently respectful and constructive. We also refer to some of our own work to develop a previous model (of social class and health) which we invariably have a stake in, and may therefore have judged differently. Overall, our motivation is to enhance the potential contribution of our academic community to informing future research, policy and practice such that we improve

population health, thereby serving our communities. Finally, we recognise that our perspective is inseparable from our own position as white, highly-paid academics in Scotland, and we may have inadvertently downplayed or misjudged particular aspects that are less familiar to us.

Results

Each of the seven included models are described in turn below. The extent to which each meets the criteria set out in the methods are described below, in Table 1.

Dahlgren and Whitehead's 'Rainbow'

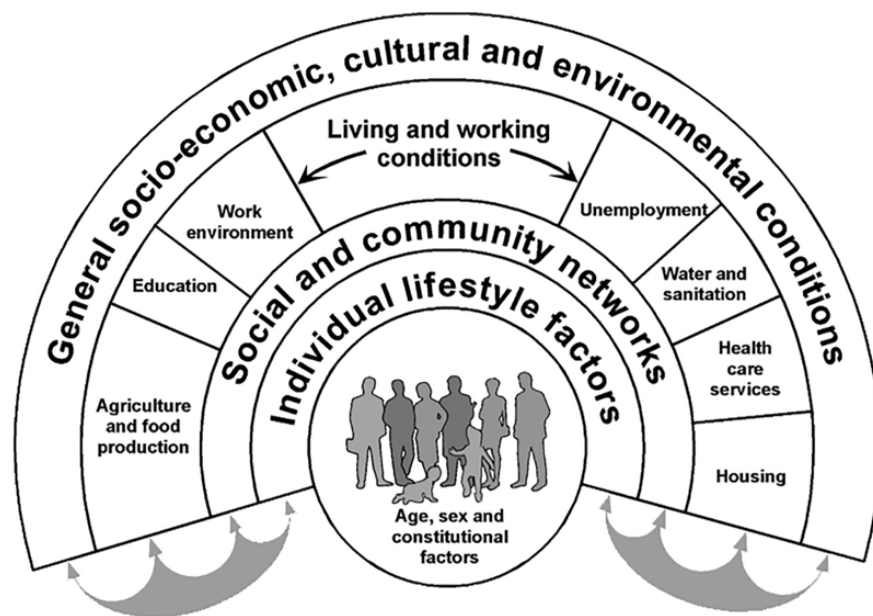


Figure 1: The Dahlgren and Whitehead model of population health (Whitehead & Dahlgren 1991). Note: Copyright CC-BY-NC-SA 3.0 IGO (Whitehead & Dahlgren 1991).

Whitehead and Dahlgren (1991) developed a pictorial model for the WHO depicting 'layers' of exposure from socioeconomic, cultural and environmental conditions on the outer, through living and working conditions, social and community networks, individual lifestyle factor to individual age, sex and constitutional factors in the centre (Figure 1). It was designed to 'visually illustrate the layers of influence on population health and provide a simple framework for thinking about the policy response of the different sectors involved in tackling these determinants' for policy actors across sectors (Dahlgren & Whitehead 2021, p. 20). It is generally understood as nesting individual determinants of health (such as age or alcohol consumption) within the context of the broader socio-economic context in which people live. A core strength is that it frames population health as product of how the outer (social and economic) layers shape the more individualised inner layers. Furthermore, it provides a list of social determinants to focus policy action. However, the model lacks a clear set of causal relations or understanding of social processes, approaching the relevant factors by placing within a diagram without connecting them or explaining their relationships. How health inequalities are generated is not explicit, nor is it clear how the

prevalence and distribution of these determinants comes about (leading to the suggestion that it represents a ‘web of causation’ without a ‘spider’ (Krieger 1994)). That said, the authors did not intend this to be a model of health inequalities, nor of action to address health inequalities, and arguably many of the critiques therefore misunderstand its original purpose (Dahlgren & Whitehead 2021).

Solar and Irwin’s model

The WHO’s Commission for the Social Determinants of Health (WHO 2008) reaffirmed the conclusions of the Black report. Background work for the Commission provided a much expanded explanation of the social and political processes underlying population health and provided a sophisticated model for understanding inequalities in health (Solar & Irwin 2010, originally developed in 2005) (Figure 2). Core strengths of this model include a distinction between different levels (structural and intermediary) of causation, in line with fundamental cause theory. The explicit theorisation of the processes that lead to the unequal distribution of the social determinants of health renders these processes amenable to change, rather than fixed ‘socio-economic determinants’, and thus sits comfortably within a political economy understanding. The clear causal flow through the model from the context on the left to the health outcomes on the right make the theorised relationship clear and makes the model more readable for users, whilst retaining elements of systems thinking by including feedback loops.

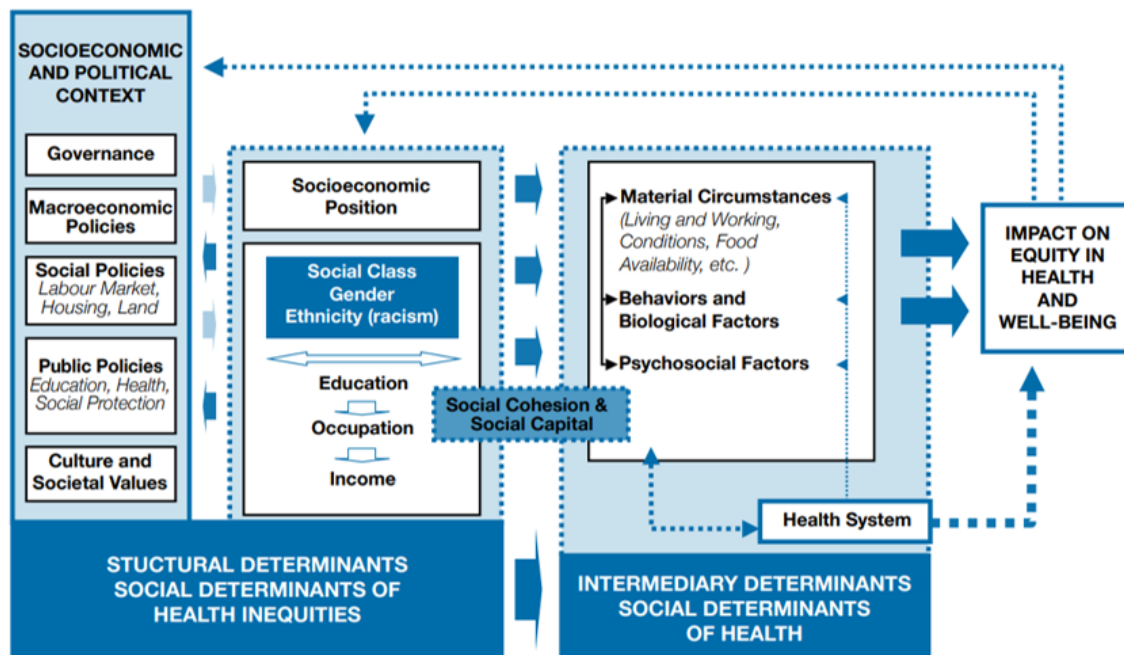


Figure 2: The Solar and Irwin (2010) theoretical framework developed to support the Commission on the Social Determinants of Health. Note: Reproduced from Solar & Irwin (2010) A conceptual framework for action on the social determinants of health. Geneva, WHO (under CC-BY-NC-SA 3.0 IGO licence).

There are, however, some weaknesses in the model. The arrows linking the boxes are not described, missing an opportunity to uncover the social processes at work (such as differential power). The arrows in the socioeconomic position box suggest that education determines occupation, which in turn determines income. Although this is clearly a set of causal relations that is likely to be important in

most contexts, it is not the only influence on occupation and income (e.g. the role of wealth inheritance and ownership of income-generating capital is important here (Piketty 2014)). Furthermore, income is an important determinant of the quality of education that can be afforded and the likely early years' experiences that influence the capacity that individuals have to benefit from education. The authors, in their wider description of the model, discuss the risks of the use of the term 'social capital', and the potential for social capital to be a depoliticised concept and one which is not amenable to political remedy (Solar & Irwin 2010, Feeley & Collins 2015). However, the model is unlikely to be used consistently in conjunction with the explanatory text and so there is a risk that social cohesion and social capital are interpreted in this depoliticised manner, reflecting again the missed opportunity to explain the linking mechanisms or arrows in the model. Finally, and perhaps its most significant conceptual weakness, and particularly relevant to the current polycrisis, ecology and environment are omitted as influences on population health.

Navarro's Dialectical Model

Navarro's (1977) model is the oldest of those included here. It was part of a broader project which sought to analyse the distribution of power and the nature of the state in 'Western industrialised societies' prior to the widespread roll-out of neoliberalism. It focuses particularly on how healthcare provision and health were both being structured by dominant capitalistic social and economic processes. As such, he argues for a more explicitly class-based analysis of health and healthcare, drawing upon the Marxist tradition of understanding how societies have developed, the power relations this generates, and the consequent distribution of resources and exposures across populations (Figure 3). The strengths of the model include the explicit incorporation of the historical development of the economic system, class and power relations, and clearly theorised causal relations, with a distinction made between deterministic and facilitative relationships. Yet, the model does not include forms of discrimination beyond class, and does not elaborate on the generation of health inequalities. Furthermore, it does little to unpack the mechanisms linking the economy, class system and health (only the health service), and does not include ecological exposures. As such, the model has limited utility for explaining population health, but it does offer a helpful exposition of the social processes involved in generating the distribution of the social determinants of health in societies which has been incorporated in subsequent work (Borrell et al. 2007, Navarro 1977, Navarro et al. 2006).

Navarro et al.'s Politics and Health Model

Building on core insights about the distribution and use of power in Navarro's (1977) model, the 'Politics and Health' model was developed to explain how different welfare state types arise and influence population health (Borrell et al. 2007, Navarro et al. 2006). This was much simpler than Navarro's earlier model and focused on how power distribution shapes labour markets and welfare state provisioning as core influences on the distribution of economic resources, and thus population health (Figure 4). The strengths of this model include: clear theorised causal directions; its simplicity and accessibility; and inclusion of important aspects of political economy. The model was intended to theorise the relationship between welfare state type and population health, rather than theorise population health through a political economy lens in the current context. Nevertheless, for our purposes, the model has limitations. Coverage of political economy is limited, and other important exposures (including ecology, geography, and history) are omitted. The mechanisms of embodiment are not explored, nor is the position of common determinants of health theorised. Finally, as with Navarro's original approach, forms of discrimination, injustice, and dimensions of health inequality beyond social class are not explicit. Indeed, they may be conflated with social class, implying that racial discrimination, for example, is reduced to an issue of class.

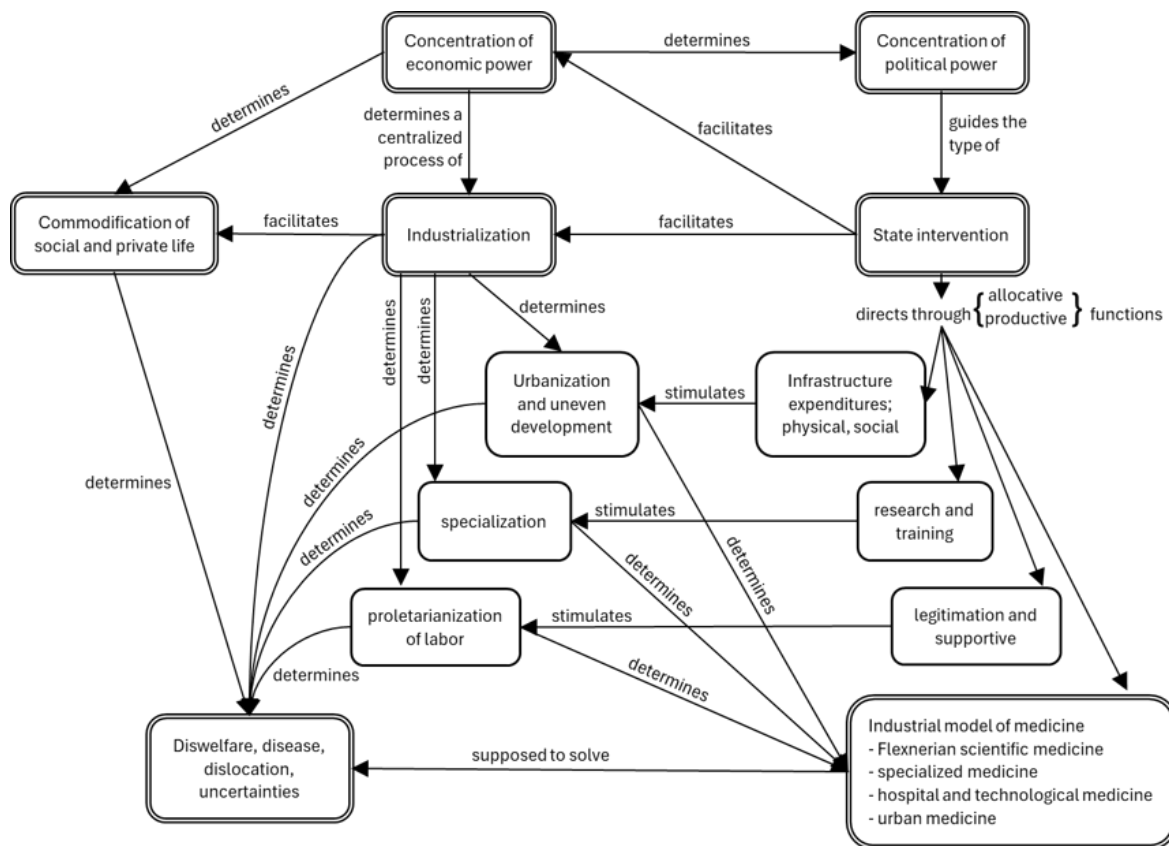


Figure 3: Navarro's (1977) model ('the dialectical relationship between society and medicine', redrawn from the original). Note: Used with permission of Mary Ann Liebert Inc, from Navarro (1977); permission conveyed through Copyright Clearance Center, Inc.

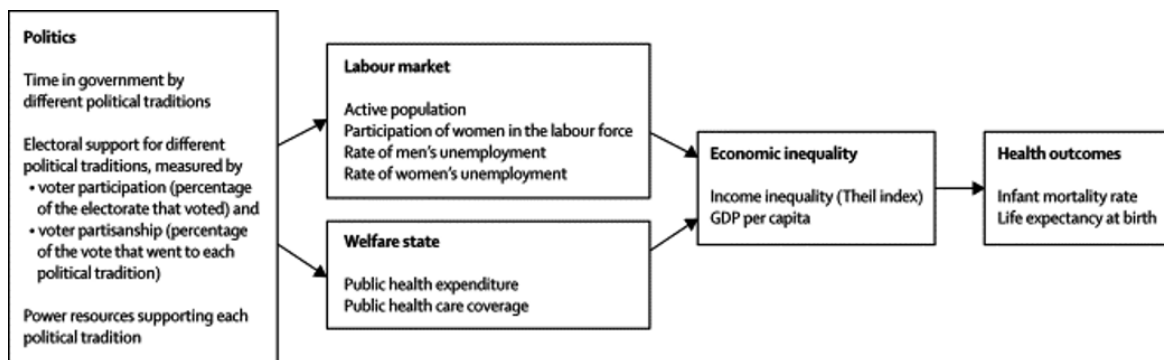


Figure 4: Navarro et al.'s (2006) model of Politics and Health. Note: Captioned in original: 'Relations between politics, labour market and welfare state policies, economic inequality, and health indicators'. Reprinted from *The Lancet* (Navarro et al. 2006), with permission from Elsevier.

McCartney et al.'s Social Class Model

Building on the work of Erik Olin Wright (2015), several health inequality researchers have sought to integrate different social class theories (or mechanisms) into health inequalities analyses (McCartney, Bartley et al. 2019, Muntaner et al. 2002, 2015, Muntaner & Gunn 2019, Wami et al. 2020, Whitley et al. 2022). This integration of class theories recognises the importance of inter-generational class exposures and early life circumstances, the Bourdieusian class mechanisms of habitus and distinction, Marxist theories of domination and exploitation, Weberian theories in relation to positions within the market, social closure and opportunity hoarding, theories of discrimination, and how these in turn influence the distribution of power and the institutionalisation of power relations (McCartney, Bartley et al. 2019) (Figure 5). However, it does not detail the relationship of class relations to recognised determinants of health (e.g. housing, income, ecology), nor integrate them into broader social relations as part of a theory of political economy, nor does it discuss mechanisms of embodiment. Finally, the linking arrows between the different aspects are difficult to follow and risk making the model difficult to understand and use.

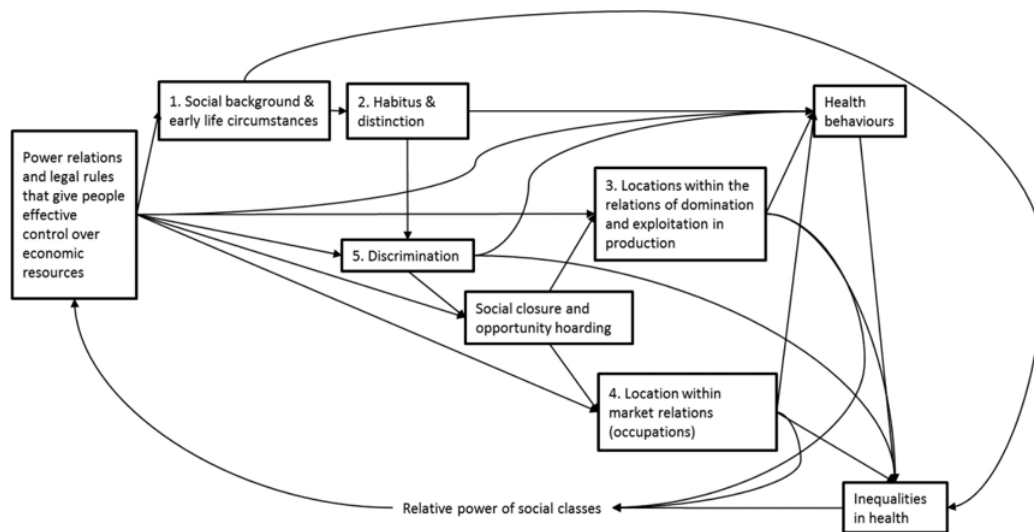


Figure 5: McCartney, Bartley et al.'s (2019) social class model. Note: Reprinted from McCartney, Bartley et al. (2019) with permission from Elsevier.

Krieger's Ecosocial Theory and Model

Ecosocial theory was developed by Krieger to overcome the limitations identified in pre-existing models of what influences the health of populations (not least why particular health outcomes arise), including the inequalities experienced by different groups (Krieger 1994, 2001, 2008, 2011), as discussed in the methods section. Figure 6 provides the visual representation. The core components of the theory are: embodiment (the literal incorporation of exposures into bodily systems); pathways of embodiment (the mechanisms through which exposures become incorporated); the cumulative interplay of exposure, susceptibility and resistance across the lifecourse; and accountability and agency in society (Krieger 2001, 2020). However, the model is arguably difficult to use as there is no 'starting point' for reading it, and no logical flow. The individual components within it are important, but are not linked by hypothesised causal relations. Many of the included aspects are also provided at a level of abstraction that is likely to be unfamiliar to key actors, potentially limiting the model's applicability.

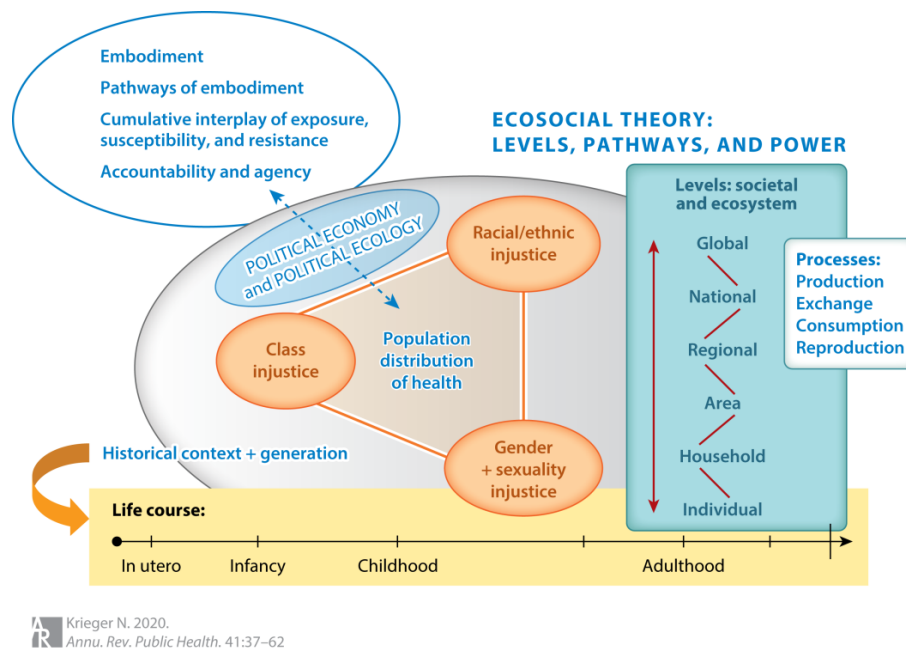


Figure 6: Krieger's ecosocial theory model (Krieger 2020). Note: Reproduced from Krieger (2020) in line with Creative Commons Attribution 4.0 International License.

Breilh's Social Determination of Health Model

Breilh's model (not depicted) arises from the critical realist tradition and nests individuals (incorporating personal lifestyles, embodiments, pheno-genotypes and psychism) under social class, gender and ethnic relations – i.e. the particular (incorporating modes of living and vulnerability as collective patterns), which in turn is nested under society – i.e. the general (incorporating social production by capital accumulation, political and cultural relations, and science-nature metabolism, all of which is nested under nature (Breilh 2021). Within the overall nature box, specific metabolism processes are detailed (artificialisation of ecosystems and the co-existence of species). The model was created to try to incorporate complexity through the multidimensional movement between dimensions and domains, and the structuration of processes (termed subsumption). For the purposes set out here, Breilh's model has many strengths including: clear articulation of ecology, social reproduction, embodiment and levels. There is no explicit causal flow through the model although this is recognised in the explanatory text, and many other features of political economy are not explicit (Breilh 2021).

Assessment of the Models

Table 1 shows our assessment of the seven selected models against our criteria. Four of the models show a clear causal flow (Solar & Irwin, Navarro's dialectical model, Navarro's politics and health model, and McCartney's social class model). The coverage of the desired exposures and social processes is sparse across models, with the exception of the Krieger's ecosocial model, and to an extent, Breilh's and Solar & Irwin's models. However, even the ecosocial model misses important aspects, including: a clear articulation of politics, politics and social movements; social determinants; psychosocial exposures; spatiotemporal scale; and vulnerability (with some other aspects only partially recognised).

		Dahlgren & Whitehead (Rainbow)	Solar & Irwin (WHO)	Navarro (Dialectical)	Navarro (Politics & Health)	McCartney (Social Class)	Krieger (Ecosocial)	Breilh (Social Determination)
Clear causal flow		No	Yes	Yes	Yes	Yes	No	No
Exposures and social processes included	Political, economic & social production & reproduction of society	No	Yes	Yes	Partial	Yes	Partial	Yes
	Politics, politics and social movements	No	Partial	Partial	Partial	No	No	No
	Social determinants	Yes	Partial	No	No	No	No	No
	Psychosocial exposures	No	Yes	No	No	No	No	No
	Biological pathways of embodiment	No	Partial	No	No	No	Yes	Yes
	Exposure across the lifecourse	No	No	No	No	Partial	Yes	No
	Levels (from global to microscopic)	Partial	No	No	No	No	Yes	Yes
	Spatio-temporal scale (including geography)	No	No	No	No	No	No	No
	History and historical contingency	No	No	No	No	No	Yes	No
	Ecosystem	Partial	No	No	No	No	Yes	Yes
	Social class processes	No	Partial	Partial	Partial	Yes	Partial	Partial
	Discrimination processes	No	Partial	No	No	Partial	Partial	Partial
	Power	No	No	Partial	No	Partial	Partial	No
	Vulnerability	No	No	No	No	No	No	Partial

Table 1: Assessment of existing selected models against our criteria

The Political Economy and Health Model

The Political Economy and Health model is designed to incorporate all the elements detailed in Table 1, with a causal flow through the diagram from left to right (Figure 7). Additional definitions, elaboration of the key concepts, and key references, are provided in Table A1 in the Appendix.

It starts on the left with ‘historical and geographical contexts’, emphasising their importance in shaping societal evolution. For example, the extent to which societies have experienced war, imperial domination, slavery, industrialisation, environmental degradation, etc. has profound influence on the political economy, culture and ecology within which particular populations live. In turn, this links to culture and social norms (including explicitly how justice is viewed within particular contexts), explicit aspects of political economy (governance and legal rules, politics and power relations, economic and social policy, corporations and firms), and the ecological environment. The former two are then both linked to processes of discrimination and social stratification (which influence how social groups are differentially ‘vulnerablised’ and exposed to things most commonly described as the ‘social determinants of health’) and a range of social class processes. Habitus and distinction represent the ways in which cultural markers are used to mark out social groups (including accent, dress codes, cultural references, etc.), as described by Bourdieu (Muntaner & Gunn 2019, Wright 2015). Opportunity hoarding (exclusion based on group characteristics, and ‘social closure’) broadly refers to the ways some social groups prevent others from accessing benefits such as well-paying jobs, or integration into social networks, drawing on the work of Weber (Darity 2022, Wright, 2015). Domination and exploitation are rooted in Marxist and broader political economy analysis. Domination refers to the exercise of power by privileged groups, such that they can shape access, and therefore the capabilities and activities of lower-order groups (e.g. by defining the nature and conduct of paid work, access to housing and public services, and education). Exploitation is a form of distributive injustice in that the owners of capital appropriate the value generated during the production process (Wright 2015). Finally, alienation is included to describe the consequences of economic competition in capitalist societies which erodes the link workers have with the products of their labour, and when interpreted more broadly, to include exclusion from opportunities to develop capabilities and from access to resources (Baum et al. 2025, Dawson 2025, Muntaner et al. 2025).

The importance of the ‘fundamental causes’ of health inequalities (including income, wealth and power) (Phelan et al. 2010) and political economy in influencing population health outcomes are represented by their centrality in the model (Doyal & Pennell 1979, Lynch 2020, McCartney et al. 2022, McCartney, Hearty et al. 2019). The two-way relationship between the fundamental causes and with ecological environment and culture and social norms (given that these are both determined by, and determinants of, the fundamental causes and political economy) is represented by the dual-headed arrows linking them.

The fundamental causes and political economy are in turn linked to all other exposures, and also to how these exposures are differentially experienced (including income, wealth, work, education, housing, physical environment, access to services, behaviours and consumption). For example, in relation to genetics where similar genotypes can result in markedly different outcomes depending on social position and contextual exposures. Separating out the intersectional forms of social position from the exposures highlights that it is not social position per se that causes health outcomes, but the interaction between social relations and exposures (in determining the degree of exposure and impact). Listing the different forms of social position and hierarchical relations also provides the means to consider how these can be compounded or mitigated by groups holding different social positions simultaneously, and across the lifecourse, all of which have immediate or lagged impacts. This draws on the insights of stratification economics around how group interests and identities shape institutional arrangements (Darity 2022), such that privileged groups have the collective interest in maintaining dominance, and subordinate groups

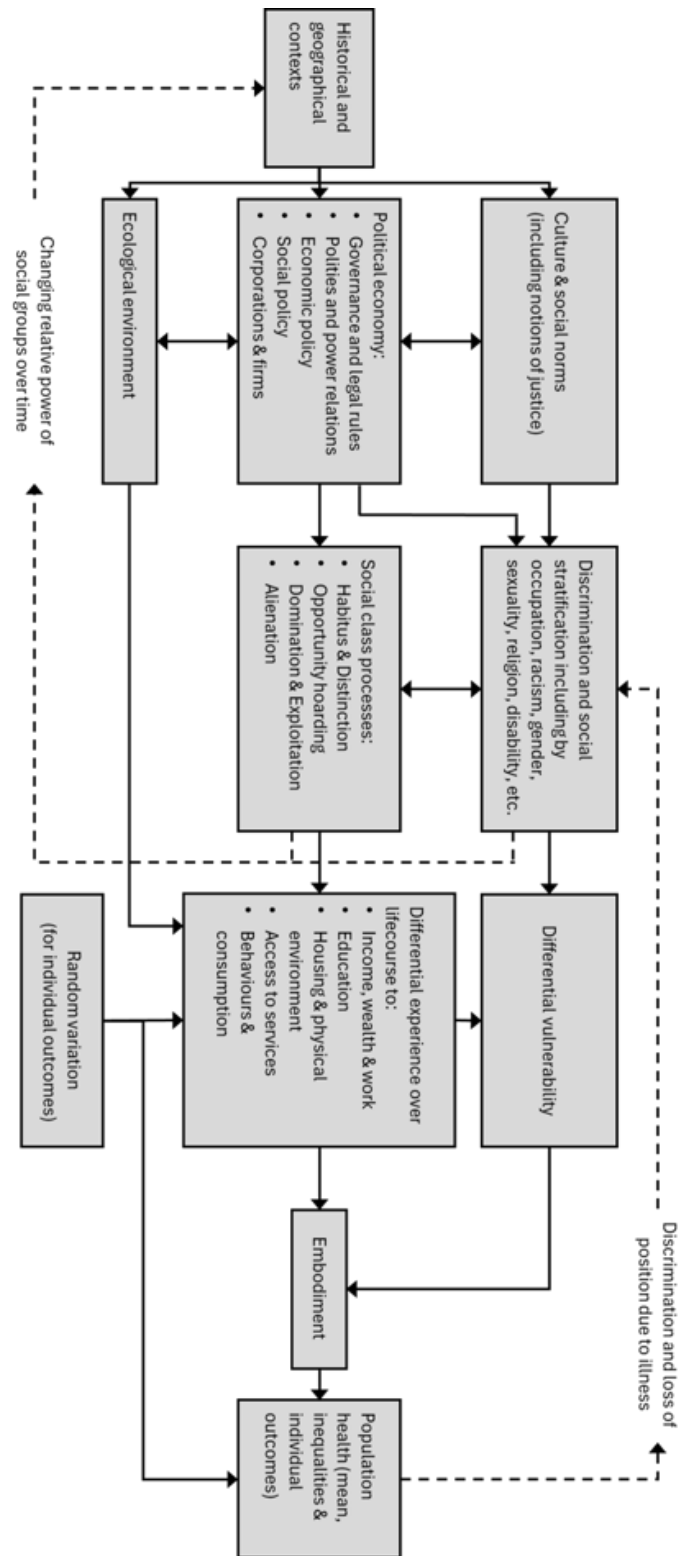


Figure 7: A new model of the causes of population health: the Political Economy and Health model

are confronted by institutional disadvantages, such as access to education, housing employment, that lead to ‘capability shortfalls’⁵ at individual and group levels (Davis 2024).

The model then describes how these exposures are then embodied (literally how these extra-corporeal aspects ‘get under the skin and into the head’ to impact on health (Krieger 2011)) by populations (both biologically and psychologically) to produce health outcomes (positive and negative, and differentially and unequally across social groups). The role of random variation is incorporated to highlight that for individuals the model is not absolutely deterministic (whereas for populations the outcomes are more predictable) (Smith 2011). It also incorporates the impact of differential vulnerability as a modifier of the relationship between exposure and outcome, reflecting Diderichsen’s (2019, p. 270) understanding of this including exposure, susceptibility and capacity to respond, which we relate to different experiences of the other aspects of political economy.

We include two forms of feedback loop in the model. First, we recognise that political economy, social class process and discrimination are always contested and evolving, with the relative balance of power changing over time (Wright 2010). Second, we acknowledge the potential for the health outcomes, through one form of health selection (whereby those who become ill or disabled are discriminated against directly or who experience social slide because of loss of income and status in societies where the welfare state does not maintain social position in such circumstances), to influence social position and subsequent exposures. Overall, this putative model meets the criteria set out for a population health theory, and links a political economy understanding of societies with explicit consideration of social class mechanisms and the distribution of power.

Discussion

In our view, understanding and responding to the polycrisis requires a theory of population health that centres on political economy, includes a range of power relationships including social class processes and recognises all forms of discrimination, recognises ecological, political and commercial determinants, and which supports the theorisation of causal relationships. Building on the strengths of existing theories and models, we propose the *Political Economy and Health model* for this purpose. It attempts to balance simplicity and rigour to understand the most important exposures and mechanisms for population health.

The core strengths of *Political Economy and Health model* are that it: provides explanation at the scale of populations and individuals; integrates a political economy understanding of how the health of populations and individuals is shaped; integrates an understanding of power, and how it is distributed, maintained and challenged; integrates social class theories and is sufficiently flexible to incorporate all forms of discrimination; recognises the determinants of health (including its various subsets such as commercial, political, economic, environmental and social); and provides a way of understanding how these exposures become embodied to generate health and illness.

Nonetheless, we recognise potential limitations. Other researchers have systematically reviewed the literature for pictorial models, and have identified many more than are included here (Givens et al. 2020). Although we have critiqued the selected seven models, we want to emphasise that we are evaluating them against a purpose and set of criteria for which they were not necessarily designed. Furthermore, we are also judging them without including surrounding explanatory text which might have clarified or addressed critiques made here, and so this should not be interpreted as critique of the authors’ understanding or viewpoints. That said, we contend that, at least to some degree, the models share an overriding purpose in that they aim to illuminate and explain factors affecting population health. We are aware that models are frequently used in this decontextualised manner, and without reference to the

⁵ Capabilities are what an individual or group are able to do or be. They are opportunities which may be generated or curtailed by an individual’s or group’s circumstances (Davis 2024).

origin texts, and we argue that models can be made ‘safer’ for such use where the scope for ambiguity and misinterpretation is minimised, as we have sought to do here.

Other researchers, with a different focus, or different interpretation of political economy or causal relations, might have generated different criteria to assess models, assessed existing models differently, prioritised different aspects and/or constructed a different model. More fundamentally, although our model is developed on the basis of a wide range of evidence, it remains to be tested for its insight in explaining population health to different audiences. Other models may be more useful if specific mechanisms are the focus, including power (Friel et al. 2021, McCartney et al. 2021), social class (McCartney, Bartley et al. 2019, Wright 2015), ecology (Breilh 2021), or work, if the focus is on embodiment and mechanisms of biological disease causation, or if determination rather than determinants is the preferred epistemological approach (Breilh 2021, 2023). The *Political Economy and Health model* is not designed as a Directed Acyclic Graph (DAG), but could be adapted into DAGs for causal analyses of more specific questions and relationships. We hope, and expect, that better models will be developed in the future than what we propose here (but hope that others can build on our contribution). Indeed, an interesting future avenue of research would be to see if surveys or Delphi studies of researchers in this area identify similar criteria, and/or assess the models in the same way as we do.

The implications of the *Political Economy and Health model* are multiple. For policymakers, it makes clear the essential role of political economy in influencing population health. Using the model for the creation of strategies and policies to improve health and reduce health inequalities would foreground the role of political economy, ecology and culture, and the need to intervene in specific areas such as governance/legislation, politics and power relations, and macroeconomic and social policy. For researchers, the model can help guide future theorisation and empirical studies on the determinants of population health. Ultimately, it is hoped that the *Political Economy and Health model* can be the basis for future iteration and improvements of our understanding of health and actions to improve it.

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Conflicts of interest

GM and RD are authors of one of the models assessed in this paper, and have worked with or corresponded with authors of some of the other models. This could have generated forms of bias in relation to the assessment of the models. The authors declare they have no other conflicts of interest.

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References

- Bambra, C. (2011) Health inequalities and welfare state regimes: Theoretical insights on a public health ‘puzzle.’ *Journal of Epidemiology and Community Health*, 65(9), 740. <https://doi.org/10.1136/jech.2011.136333>
- Bambra, C., & Marmot, M. (2023) *Expert report for the UK Covid-19 Public Inquiry. Module 1: Health inequalities.* UK Covid-19 Public Inquiry. <https://covid19.public-inquiry.uk/documents/inq000195843-expert-report-by-professor-clare-bambra-and-professor-sir-michael-marmot-dated-30-may-2023/>
- Basu, S., Carney, M. A., & Kenworthy, N. J. (2017) Ten years after the financial crisis: The long reach of austerity and its global impacts on health. *Social Science & Medicine*, 187, 203–207. <https://doi.org/10.1016/j.socscimed.2017.06.026>
- Baum, F., Anaf, J., Freeman, T., Musolino, C., van den Berg, M., Friel, S., & Schram, A. (2025) Twenty-first century alienation and health: A research agenda. *Journal of Epidemiology and Community Health*, 79, 481–483. <https://doi.org/10.1136/jech-2024-223112>
- Beckfield, J., & Krieger, N. (2009) Epi + demos + cracy: Linking political systems and priorities to the magnitude of health inequities—evidence, gaps, and a research agenda. *Epidemiologic Reviews*, 31(1), 152–177. <https://doi.org/10.1093/epirev/mxp002>
- Black, D., Morris, J. N., Smith, C., & Townsend, P. (1988) *Inequalities in health: The Black Report*. Penguin.
- Borrell, C., Espelt, A., Rodríguez-Sanz, M., & Navarro, V. (2007) Politics and health. *Journal of Epidemiology and Community Health*, 61(8), 658–659. <https://doi.org/10.1136/jech.2006.059063>
- Braveman, P. (2022) Defining health equity. *Journal of the National Medical Association*, 114(6), 593–600. <https://doi.org/10.1016/j.jnma.2022.08.004>
- Breilh, J. (2021) Why critical epidemiology?: Daring ethical science in an unhealthy civilization. In J. Breilh & N. Krieger, *Critical epidemiology and the people’s health* (pp. 47–132). Oxford University Press. <https://doi.org/10.1093/med/9780190492786.003.0003>
- Breilh, J. (2023) The social determination of health and the transformation of rights and ethics. *Global Public Health*, 18(1), 2193830. <https://doi.org/10.1080/17441692.2023.2193830>
- Brook, A., Rendall, G., Hearty, W., Meier, P., Thomson, H., Macnamara, A., ... & McCartney, G. (2024) What is the relationship between changes in the size of economies and mortality derived population health measures in high income countries: A causal systematic review. *Social Science & Medicine*, 357, 117190. <https://doi.org/10.1016/j.socscimed.2024.117190>

- Buse, K., Bestman, A., Srivastava, S., Marten, R., Yangchen, S., & Nambiar, D. (2023) What are healthy societies? A thematic analysis of relevant conceptual frameworks. *International Journal of Health Policy and Management*, 12(1), 1–12. <https://doi.org/10.34172/ijhpm.2023.7450>
- Collins, C., McCartney, G., & Garnham, L. (2016) Neoliberalism and health inequalities. In K. E. Smith, C. Bambra, & S. E. Hill (Eds.), *Health Inequalities: Critical perspectives* (pp. 124–137). Oxford University Press.
- Dahlgren, G., & Whitehead, M. (2021) The Dahlgren-Whitehead model of health determinants: 30 years on and still chasing rainbows. *Public Health*, 199, 20–24. <https://doi.org/10.1016/j.puhe.2021.08.009>
- Darity, W. A., Jr. (2022) Position and possessions: Stratification economics and intergroup inequality. *Journal of Economic Literature*, 60(2), 400–426. <https://doi.org/10.1257/jel.20211690>
- Davies, S. C., Winpenny, E., Ball, S., Fowler, T., Rubin, J., & Nolte, E. (2014) For debate: A new wave in public health improvement. *The Lancet*, 384(9957), 1889–1895. [https://doi.org/10.1016/S0140-6736\(13\)62341-7](https://doi.org/10.1016/S0140-6736(13)62341-7)
- Davis, J. B. (2024) *Identity, capabilities, and changing economics: Reflexive, adaptive, socially embedded individuals*. Cambridge University Press.
- Dawes, D. E., Amador, C. M., & Dunlap, N. J. (2022) *The political determinants of health: A global panacea for health inequities*. Oxford University Press. <https://doi.org/10.1093/acrefore/9780190632366.013.466>
- Dawson, M. (2025) Marxism on Musk: Reflections on Baum et al.’s ‘Twenty-first century alienation and health.’ *Journal of Epidemiology and Community Health*, 79, 477–478. <https://doi.org/10.1136/jech-2025-223762>
- Diderichsen, F., Hallqvist, J., & Whitehead, M. (2019) Differential vulnerability and susceptibility: How to make use of recent development in our understanding of mediation and interaction to tackle health inequalities. *International Journal of Epidemiology*, 48(1), 268–274. <https://doi.org/10.1093/ije/dyy167>
- Doyal, L., & Pennell, I. (1979) *The political economy of health*. Pluto Press.
- Feeney, M., & Collins, C. (2015) Tea in the pot: Building ‘social capital’ or a ‘great good place’ in Govan? *Collaborative Reports Series*, 3. UWS-Oxfam Partnership. https://myresearchspace.uws.ac.uk/ws/portalfiles/portal/51893121/2015_03_31_Feeney_Final.pdf
- Floud, R., Fogel, R. W., Harris, B., & Hong, S. C. (2014) *Health, mortality and the standard of living in Europe and North America since 1700*. Edward Elgar.
- Friel, S., Townsend, B., Fisher, M., Harris, P., Freeman, T., & Baum, F. (2021) Power and the people’s health. *Social Science & Medicine*, 282, 114173. <https://doi.org/10.1016/j.socscimed.2021.114173>

- Gilmore, A. B., Fabbri, A., Baum, F., Bertscher, A., Bondy, K., Chang, H.-J., ... & Thow, A. M. (2023) Defining and conceptualising the commercial determinants of health. *The Lancet*, 401(10383), 1194–1213. [https://doi.org/10.1016/S0140-6736\(23\)00013-2](https://doi.org/10.1016/S0140-6736(23)00013-2)
- Givens, M. L., Catlin, B. B., Johnson, S. P., Pollock, E. A., Faust, V. N., Inzeo, P. T., & Kindig, D. A. (2020) What do we know about the drivers of health and equity? A narrative review of graphic representations. *Health Equity*, 4(1), 446–462. <https://doi.org/10.1089/heq.2020.0013>
- Hanlon, P., Carlisle, S., Hannah, M., Reilly, D., & Lyon, A. (2011) Making the case for a ‘fifth wave’ in public health. *Public Health*, 125(1), 30–36. <https://doi.org/10.1016/j.puhe.2010.09.004>
- Harvey, D. (2021) The political economy of health: Revisiting its Marxian origins to address 21st-century health inequalities. *American Journal of Public Health*, 111, 293–300. <https://doi.org/10.2105/AJPH.2020.305996>
- Heller, J. C., Fleming, P. J., Petteway, R. J., Givens, M., & Pollack Porter, K. M. (2023) Power up: A call for public health to recognize, analyze, and shift the balance in power relations to advance health and racial equity. *American Journal of Public Health*, 113(10), 1079–1082. <https://doi.org/10.2105/AJPH.2023.307380>
- Heller, J. C., Givens, M. L., Johnson, S. P., & Kindig, D. A. (2024) Keeping it political and powerful: Defining the structural determinants of health. *The Milbank Quarterly*, 102(2), 351–366. <https://doi.org/10.1111/1468-0009.12695>
- Ho, J. Y., & Hendi, A. S. (2018) Recent trends in life expectancy across high income countries: Retrospective observational study. *BMJ*, 362, k2562. <https://doi.org/10.1136/bmj.k2562>
- Krieger, N. (1994) Epidemiology and the web of causation: Has anyone seen the spider? *Social Science & Medicine*, 39(7), 887–903. [https://doi.org/10.1016/0277-9536\(94\)90202-X](https://doi.org/10.1016/0277-9536(94)90202-X)
- Krieger, N. (2001) Theories for social epidemiology in the 21st century: An ecosocial perspective. *International Journal of Epidemiology*, 30(4), 668–677. <https://doi.org/10.1093/ije/30.4.668>
- Krieger, N. (2008) Proximal, distal, and the politics of causation: What’s level got to do with it? *American Journal of Public Health*, 98(2), 221–230.
- Krieger, N. (2011) *Epidemiology and the people’s health. Theory and context*. Oxford University Press.
- Krieger, N. (2014a) Got theory? On the 21st c. CE rise of explicit use of epidemiologic theories of disease distribution: A review and ecosocial analysis. *Current Epidemiology Reports*, 1(1), 45–56. <https://doi.org/10.1007/s40471-013-0001-1>
- Krieger, N. (2020) Measures of racism, sexism, heterosexism, and gender binarism for health equity research: From structural injustice to embodied harm—an ecosocial analysis. *Annual Review of Public Health*, 41(1), 37–62. <https://doi.org/10.1146/annurev-publhealth-040119-094017>
- Link, B. G., & Phelan, J. (1995) Social conditions as fundamental causes of disease. *Journal of Health and Social Behavior*, (Extra Issue), 80–94. <https://doi.org/10.2307/2626958>

- Lynch, J. (2020) *Regimes of inequality: The political economy of health and wealth*. Cambridge University Press.
- McCartney, G. (2022) *Political economy and population health: From theory to an empirical assessment of the impact of austerity on mortality trends*. [PhD, University of Glasgow]. <https://theses.gla.ac.uk/83260/>
- McCartney, G., Bartley, M., Dundas, R., Katikireddi, S. V., Mitchell, R., Popham, F., Walsh, D., & Wami, W. (2019) Theorising social class and its application to the study of health inequalities. *SSM Population Health*, 7, 100315. <https://doi.org/10.1016/j.ssmph.2018.10.015>
- McCartney, G., Büchs, M., Hensher, M., & Mazzei, M. (2025) What is a Wellbeing Economy, and what might its impact be on population health? *The Lancet Public Health*, 10(10), e879–e889. [https://doi.org/10.1016/S2468-2667\(25\)00192-6](https://doi.org/10.1016/S2468-2667(25)00192-6)
- McCartney, G., Dickie, E., Escobar, O., & Collins, C. (2021) Health inequalities, fundamental causes and power: Towards the practice of good theory. *Sociology of Health & Illness*, 43(1), 20–39. <https://doi.org/10.1111/1467-9566.13181>
- McCartney, G., Hearty, W., Arnot, J., Popham, F., Cumbers, A., & McMaster, R. (2019) Impact of political economy on population health: A systematic review of reviews. *American Journal of Public Health*, 109(6), e1–e12. <https://doi.org/10.2105/AJPH.2019.305001>
- McCartney, G., McMaster, R., Shipton, D., Harding, O., & Hearty, W. (2022) Glossary: Economics and health. *Journal of Epidemiology and Community Health*, 76(5), 518. <https://doi.org/10.1136/jech-2021-218244>
- McCartney, G., Popham, F., McMaster, R., & Cumbers, A. (2019) Defining health and health inequalities. *Public Health*, 172, 22–30. <https://doi.org/10.1016/j.puhe.2019.03.023>
- Muntaner, C., & Gunn, V. (2019) In defense of class wars in population health: The new landscape of social class with Bourdieu, neo-Marxists, and the Kohn/Schooler/Wright Integrative Models. *International Journal of Health Services*, 49(1), 102–107. <https://doi.org/10.1177/0020731418818409>
- Muntaner, C., Gunn, V., & Prins, S. J. (2025) Alienation: Another contested Marxian construct in epidemiology and public health. *Journal of Epidemiology and Community Health*, 79(8), 569–70. <https://doi.org/10.1136/jech-2025-223840>
- Muntaner, C., Lynch, J. W., Hillemeier, M., Lee, J. H., David, R., Benach, J., & Borrell, C. (2002) Economic inequality, working-class power, social capital, and cause-specific mortality in wealthy countries. *International Journal of Health Services*, 32(4), 629–656. <https://doi.org/10.2190/N7A9-5X58-0DYT-C6AY>
- Muntaner, C., Ng, E., Chung, H., & Prins, S. J. (2015) Two decades of Neo-Marxist class analysis and health inequalities: A critical reconstruction. *Social Theory & Health*, 13(3), 267–287. <https://doi.org/10.1057/sth.2015.17>
- Navarro, V. (1977) Social class, political power, and the state and their implications in medicine. *International Journal of Health Services*, 7(2), 255–292. <https://doi.org/10.2190/WPNY-UR3N-0DH9-JTA4>

- Navarro, V., Muntaner, C., Borrell, C., Benach, J., Quiroga, Á., Rodríguez-Sanz, M., Vergés, N., & Pasarín, M. I. (2006) Politics and health outcomes. *The Lancet*, 368(9540), 1033–1037. [https://doi.org/10.1016/S0140-6736\(06\)69341-0](https://doi.org/10.1016/S0140-6736(06)69341-0)
- Noonan, R. J. (2024) What are the roots of the nation's poor health and widening health inequalities? Rethinking economic growth for a fairer and healthier future. *Community Health Equity Research & Policy*, 45(4), 395–404. <https://doi.org/10.1177/2752535X241259241>
- Phelan, J. C., Link, B. G., Diez-Roux, A., Kawachi, I., & Levin, B. (2004) “Fundamental causes” of social inequalities in mortality: A test of the theory. *Journal of Health and Social Behavior*, 45(3), 265–285. <https://doi.org/10.1177/002214650404500303>
- Phelan, J. C., Link, B. G., & Tehranifar, P. (2010) Social conditions as fundamental causes of health inequalities: Theory, evidence, and policy implications. *Journal of Health and Social Behavior*, 51(1_suppl), S28–S40. <https://doi.org/10.1177/0022146510383498>
- Piketty, T. (2014) *Capital in the twenty-first century*. Harvard University Press.
- Rabinowitz, P. M., & Barry, M. (2024) Environmental determinants of health—Time to redefine the social history? *JAMA*, 332(22), 1881–1882. <https://doi.org/10.1001/jama.2024.19490>
- Rahman, R., Reid, C., Kloer, P., Henchie, A., Thomas, A., & Zwigelaar, R. (2024) A systematic review of literature examining the application of a social model of health and wellbeing. *European Journal of Public Health*, 34(3), 467–472. <https://doi.org/10.1093/eurpub/ckae008>
- Smith, G. D. (2011) Epidemiology, epigenetics and the ‘Gloomy Prospect’: Embracing randomness in population health research and practice. *International Journal of Epidemiology*, 40(3), 537–562. <https://doi.org/10.1093/ije/dyr117>
- Solar, O., & Irwin, A. (2010) *Conceptual framework for action on the social determinants of health. Discussion paper for the Commission on Social Determinants of Health*. World Health Organization. <https://iris.who.int/handle/10665/44489>
- Virchow, R. (1848) *Mittheilungen über die in Oberschlesien herrschenden Typhus-Epidemie*. Georg Andreas Reimer Verlag.
- Walsh, D., & McCartney, G. (2025) *‘Social murder’? Austerity and life expectancy in the UK*. Policy Press.
- Wami, W., McCartney, G., Bartley, M., Buchanan, D., Dundas, R., Katikireddi, S. V., Mitchell, R., & Walsh, D. (2020) Theory driven analysis of social class and health outcomes using UK nationally representative longitudinal data. *International Journal for Equity in Health*, 19(1), 193. <https://doi.org/10.1186/s12939-020-01302-4>
- Whitehead, M., & Dahlgren, G. (1991) *Policies and strategies to promote social equity in health*. Institute for Futures Studies.
- Whitley, E., McCartney, G., Bartley, M., & Benzeval, M. (2022) Examining the impact of different social class mechanisms on health inequalities: A cross-sectional analysis of an all-age UK household panel study. *Social Science & Medicine*, 312, 115383. <https://doi.org/10.1016/j.socscimed.2022.115383>

WHO (World Health Organization) (2008) *Closing the gap in a generation: Health equity through action on the social determinants of health*. WHO Commission on the Social Determinants of Health.

WHO (World Health Organization) (2021) *The Geneva Charter for well-being*. World Health Organization.
<https://www.who.int/publications/m/item/the-geneva-charter-for-well-being>

Wright, E. O. (2010). *Envisioning real utopias*. Verso.

Wright, E. O. (2015) *Understanding class*. Verso.

Appendix

Table A1 – Key concepts and references for understanding the *Political Economy and Health* model

Concepts (ordered as they appear in Figure 7, from left to right, and top to bottom)	Elaboration	Key references
Historical and geographical contexts	This recognises that populations experience political economy different depending on their location and history. This includes: spatial inequalities within and between countries (e.g. during the industrial revolution in UK cities, the prevailing Westerly winds often meant that air pollution was worse in the Eastern parts of cities; more recent focus has related to the availability of green or blue spaces); the physical endowments (e.g. plentiful fresh water or coal deposits) or limitations presented by different geographical contexts (e.g. low-lying land interacts with climate change to increase the risk of flooding); historical events and processes which continue to have substantial influence (e.g. colonialism, wars, slavery, industrialisation, environmental degradation, migration); and the particular historical path dependencies across countries and social groups (e.g. the extent to which institutions and laws have developed, and in what direction, and the historical experiences of particular social or ethnic groups).	(Graeber & Wengrow, 2022; Piketty, 2014, 2020; Sen, 1999)
Culture and social norms	Tylor defines culture as, “that complex whole which includes knowledge, belief, art, law, morals, custom, and any other capabilities and habits acquired by man [sic] as a member of society”. This wide definition overlaps with some other specified aspects of political economy in our model (e.g. law), but includes many aspects that are not. The ways in which we collectively understand the world, the dominant values and ideas, the behaviours and actions that are normalised, are in turn shaped by geographical and historical contexts, but also influence other aspects of political economy.	(Arnold, 1869; Burnett Tylor, 2012; Denning, 2004; Graeber, 2014; Graeber & Wengrow, 2022; J. O’Connor, 2022, 2024)
Notions of justice	What is need as just, or fair, within any given society is important as it influences legislation and what is tolerated. Fraser argues that there are two forms of injustice: maldistribution (i.e. in relation to the distribution of resources) and misrecognition (i.e. relating to the recognition of differences between social groups and identities).	(Fraser, 2010)

Political economy	“Societies are complex and dynamic systems shaped by their historical contingencies as well as their contemporary economics, production and consumption activities, power relations, governance, policies, politics (or institutions), legal rules, culture, values, and ecology. We use the term political economy to describe these aspects of societies, their interrelationships and power dynamics” (McCartney, Hearty, et al., 2019). Although we have a single ‘box’ for political economy in the model, political economy more properly incorporates most of the aspects in the model, and their inter-relationships, as defined above. However, we explicitly highlight several aspects here which are not covered elsewhere in the model: governance and legal rules; politics and power relations; economic policy; social policy; corporations and firms. It is worth noting that the inclusion of corporations and firms here, as well as the parameters in which markets (or other forms of provisioning) take place, allow for the inclusion of the commercial determinants of health which are central to the understanding of population health.	(Akbar, 2020; Beckfield, 2018; Clare Bambra, 2011; Doyal & Pennell, 1979; Friel, 2023; Friel et al., 2023, 2024; Gilmore et al., 2023; Lowery, 2026; Lynch, 2020; McCartney, Hearty, et al., 2019; Mooney, 2012)
Ecological environment	The Oxford English Dictionary defines ecology as the, “branch of biology that deals with the relationships between living organisms and their environment”. Ecology matters for population at all scales, whether this is the gut and skin flora we carry as humans, the interactions between other species and humans (including the transmission of infections and the dynamics which contribute to antimicrobial resistance – all of which has foregrounded the ‘One Health’ agenda of the WHO), or the consequences of deforestation, ocean acidification, biodiversity loss or climate change on health.	(Friel, 2019, 2023; Lee & Romero, 2023; Romanello et al., 2022; Winkler et al., 2025; World Health Organization, 2026)
Relative power of social groups	Power, and the ways in which social groups (i.e. groups of individuals who share common experiences, and/or share a social position in relation to others) can exercise agency, is critical to any political economy understanding of society. Lukes described three ‘faces’ of power: decision-making power (usually exercised through political action and governments); non-decision-making power (e.g. to set agendas); and ideological power (i.e. the ability influence what people want or believe). The feedback loop here indicates the way in which the balance of power can change over time, and in turn this can reset	(Friel et al., 2021; Harris et al., 2020; Heller et al., 2023, 2024; Lukes, 2021; McCartney et al., 2021; Navarro, 1977; Power, 2004; Wright, 2010)

	the influence of other aspects of political economy (e.g. through the changing of legislation, or through general strikes).	
Discrimination	There are many definitions of discrimination, but Krieger summarises this neatly as, “restrict[ion], by judgment and action, the lives of those against whom they discriminate”. Discrimination can occur against different social groups at different times and in different contexts, and any list of groups who are (or have been) discriminated against, is always at risk of omission. However, this includes as a minimum, discrimination by ethnicity, migration status, gender, sex, trans status, sexuality, disability, age and social class. Discrimination is also often intersectional, whereby people can suffer from multiplicate oppression as a consequence of belonging to more than one discriminated-against group. The inclusion of social class here represents a form of ‘classism’, and this overlaps with some of the social class processes discussed further below. It is also important to note that the consequences should not be attributed simply to ‘race’, ‘gender’, ‘age’, etc., but to racism, misogyny, ageism, etc.	(Krieger, 2011, 2014, 2014, 2020a, 2020b; Mandelbaum, 2020)
Social stratification	Social stratification refers to the processes through which social groups are filtered into hierarchical relationships, often through features and practices of institutions, and the economic relationships different social classes experience.	(Darity, 2022; Davis, 2024)
Social class processes	Wright (2015) synthesised a wide range of theories of social class into a single model. The social class processes described here (and in more detail below) recognise the economic relationships between social groups who occupy different positions in the economy, and how this impacts on population health outcomes.	(McCartney, Bartley, et al., 2019; Muntaner et al., 2015; Muntaner & Gunn, 2019; Navarro, 1977; Sayer, 2014; Sayer & McCartney, 2021; Wright, 2015)
Habitus and distinction	Habitus and distinction represent the ways in which cultural markers are used to mark out social groups (including accent, dress codes, cultural references, etc.), as described by Bourdieu.	(McCartney, Bartley, et al., 2019; Muntaner & Gunn, 2019; Wright, 2015)
Opportunity hoarding	Opportunity hoarding (and ‘social closure’) broadly refers to the ways some social groups prevent others from accessing benefits such as well-paying jobs, or integration into social networks, drawing on the work of Weber.	(McCartney, Bartley, et al., 2019; Wright, 2015)
Domination	Domination arises from Marxist understandings of class and describes how privileged classes can control the lives and activities of others (e.g. by defining the nature and conduct of paid work).	(McCartney, Bartley, et al., 2019; Wright, 2015)

Exploitation	Exploitation is rooted in the Marxist understanding of class. It encapsulates how economic benefits are siphoned from workers to the owners of capital.	(McCartney, Bartley, et al., 2019; Wright, 2015)
Alienation	Alienation describes the consequences of economic competition in capitalist societies which erodes the link workers have with the products of their labour.	(Baum et al., 2025; Dawson, 2025; Muntaner et al., 2025)
Vulnerability and vulnerablisation	Vulnerability refers to the nexus between exposure, susceptibility, and capacity of response (Diderichsen et al., 2019), whilst vulnerablisation concerns the processes through which individuals and populations are made more (or less) vulnerable by altering these factors. Its use here allows for an understanding that the impact of exposure can vary by population and over time depending on these interactions.	(Diderichsen et al., 2019)
Exposure	Exposure describes the encounter individuals or populations have with factors which might influence their health. The idea of measure the wide range of exposures encountered over time has led to the concept of the ‘exposome’.	(Wild, 2012)
Lifecourse	The lifecourse simply represents the period of time over which human organisms live, recognising the importance of exposures at different times and their lagged effects. This also recognises in-utero exposures.	(Ben-Shlomo & Kuh, 2002)
Income and wealth	Levels and distributions of income and wealth within and between populations is an important link between political economy and the ability to provision for needs.	(Brook et al., 2024; Igelström et al., 2024; McCartney et al., 2022; McCartney, 2025)
Work	The availability and quality of work, contractual status, autonomy, pay levels, worker organisation, and workplace democracy all matter for health. In different contexts, the degree to which many forms of work are provided through labour markets or different parts of the social economy varies, and this has particular implications for different social groups (e.g. the extent to which care is commodified and distributed by gender).	(Cumbers, 2018; Graeber, 2018; Pearce, 2003; Roelfs et al., 2011)
Education	Education includes the access, quality, duration and diversity of learning opportunities individuals and populations have. Although this includes ‘health literacy’, it is much broader and strongly influences access to different forms of work.	(Balaj et al., 2024)
Housing	The availability, location, quality, cost and form of housing, all impact on health, directly through material pathways, and socially through the social living arrangements it generates, and the access to networks, work and other resources it enables or limits.	(Thomson & Petticrew, 2013)

Physical environment	The nature of the physical environment, including air and water quality, the availability and quality of green and blue spaces, and the physical infrastructure of places (e.g. walkable paths, sewerage systems) are all important mechanisms linking political economy to health.	
Access to services	The location, quality, culture and costs of services all contribute to how they are accessed within and between populations. This includes a wide range of services widely considered to be foundational for living (including health and social care), and services which might be more discretionary.	(Foundational Economy Collective, 2018; J. O'Connor, 2022)
Behaviours and consumption	The role of health behaviours (most commonly listed to include diet, physical activity, smoking, alcohol and drug use, but can be extended to include gambling, participation in arts and cultural activities, and much more) is well recognised as being an important mechanism linking broader aspects of political economy to health, but their role in explaining health inequalities is often over-emphasised, or decontextualised from their own structuring and determining pathways. Other forms of consumption (i.e. of all goods and services) can also impact on health outcomes.	(Black et al., 1988; McCartney et al., 2013; Robinson et al., 2026)
Random variation	The causes of prevalence (i.e. how common something is in a population and its trends) should not be confused with the causes of individual cases, the latter of which is much more influenced by chance. Introducing random variation in the model here allows for individual variation within populations to be better understood.	(Smith, 2011)
Embodiment	This describes the range of ways in which exposures are translated into health consequences (i.e. how they get 'under the skin and into the head').	(Krieger, 2005)
Discrimination (and loss of position due to illness)	This part of the model refers specifically to the change in social position experienced in some contexts as a consequence of illness or disability. This is particularly the case in context where catastrophic healthcare costs can arise (e.g. where universal health care is not provided) and where there is marked discrimination towards people with particular illness and disabilities (e.g. as has been the case with HIV in many places) which lead to a deterioration in social position. It should be noted that this is not the main driver of health inequalities in most contexts (McCartney et al., 2013).	(McCartney et al., 2013; West, 1991)
Population health	Definitions of health, and health inequality (the equivalent of health equity as used in	(Braveman, 2022; McCartney, Popham, et al., 2019)

	North America) are often disputed. In this model, health is defined as, “a structural, functional and emotional state that is compatible with effective life as an individual and as a member of society and a definition of health inequalities as the 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 are proposed. Population health is a less commonly used term but can usefully be defined to encompass the average, distribution and inequalities in health within a society” (McCartney, Popham, et al., 2019).	
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References

- Akbar, A. A. (2020). Demands for a Democratic Political Economy: Responding to Michael J. Klarman, The Degradation of American Democracy—And the Court. *Harvard Law Review Forum*, 134(1).
- Arnold, M. (1869). *Culture and Anarchy: An essay in political and social criticism*. Smith, Elder and Co.
- Balaj, M., Henson, C. A., Aronsson, A., Aravkin, A., Beck, K., Degail, C., Donadello, L., Eikemo, K., Friedman, J., Giouleka, A., Gradeci, I., Hay, S. I., Jensen, M. R., Mclaughlin, S. A., Mullany, E. C., O'connell, E. M., Sripada, K., Stonkute, D., Sorensen, R. J. D., ... Gakidou, E. (2024). Effects of education on adult mortality: A global systematic review and meta-analysis. *The Lancet Public Health*, 9(3), e155–e165. [https://doi.org/10.1016/S2468-2667\(23\)00306-7](https://doi.org/10.1016/S2468-2667(23)00306-7)
- Baum, F., Anaf, J., Freeman, T., Musolino, C., van den Berg, M., Friel, S., & Schram, A. (2025). Twenty-first century alienation and health: A research agenda. *Journal of Epidemiology and Community Health*, jech-2024-223112. <https://doi.org/10.1136/jech-2024-223112>
- Beckfield, J. (2018). *Political Sociology and the People's Health* (N. Krieger, Ed.). Oxford University Press. <https://doi.org/10.1093/oso/9780190492472.001.0001>
- Ben-Shlomo, Y., & Kuh, D. (2002). A life course approach to chronic disease epidemiology: Conceptual models, empirical challenges and interdisciplinary perspectives. *International Journal of Epidemiology*, 31(2), 285–293. <https://doi.org/10.1093/ije/31.2.285>
- Black, D., Morris, J. N., Smith, C., & Townsend, P. (1988). The Black report. In *Inequalities in Health*. Penguin.
- Braveman, P. (2022). Defining Health Equity. *Journal of the National Medical Association*, 114(6), 593–600. <https://doi.org/10.1016/j.jnma.2022.08.004>
- Brook, A., Rendall, G., Hearty, W., Meier, P., Thomson, H., Macnamara, A., Westborne, R., Campbell, M., & McCartney, G. (2024). What is the relationship between changes in the size of economies and mortality derived population health measures in high income countries: A causal systematic review. *Social Science & Medicine*, 357, 117190. <https://doi.org/10.1016/j.socscimed.2024.117190>

- Burnett Tylor, E. (2012). *Primitive Culture Researches into the Development of Mythology, Philosophy, Religion, Art, and Custom*. Cambridge University Press.
- Clare Bambra. (2011). Work, worklessness and the political economy of health inequalities. *Journal of Epidemiology and Community Health*, 65(9), 746. <https://doi.org/10.1136/jech.2009.102103>
- Cumbers, A. (2018). A new definition of economic democracy – and what it means for inequality. *London School of Economics*. <https://blogs.lse.ac.uk/businessreview/2018/03/03/a-new-definition-of-economic-democracy-and-what-it-means-for-inequality/>
- Darity, W. A., Jr. (2022). Position and Possessions: Stratification Economics and Intergroup Inequality. *Journal of Economic Literature*, 60(2), 400–426. <https://doi.org/10.1257/jel.20211690>
- Davis, J. B. (2024). *Identity, Capabilities, and Changing Economics: Reflexive, Adaptive, Socially Embedded Individuals*. Cambridge University Press.
- Dawson, M. (2025). Marxism on Musk: Reflections on Baum et al’s ‘Twenty-First Century Alienation and Health.’ *Journal of Epidemiology and Community Health*, jech-2025-223762. <https://doi.org/10.1136/jech-2025-223762>
- Denning, M. (2004). *Culture in the Age of Three Worlds*. Verso.
- Diderichsen, F., Hallqvist, J., & Whitehead, M. (2019). Differential vulnerability and susceptibility: How to make use of recent development in our understanding of mediation and interaction to tackle health inequalities. *International Journal of Epidemiology*, 48(1), 268–274. <https://doi.org/10.1093/ije/dyy167>
- Doyal, L., & Pennell, I. (1979). *The political economy of health*. Pluto Press.
- Foundational Economy Collective. (2018). *Foundational Economy: The infrastructure of everyday life*. Manchester University Press.
- Fraser, N. (2010). *Scales of Justice. Reimagining political space in a globalizing world*. Columbia University Press.
- Friel, S. (2019). *Climate Change and the People’s Health* (N. Krieger, Ed.). Oxford University Press. <https://doi.org/10.1093/oso/9780190492731.001.0001>
- Friel, S. (2023). Climate change mitigation: Tackling the commercial determinants of planetary health inequity. *The Lancet*, 402(10419), 2269–2271. [https://doi.org/10.1016/S0140-6736\(23\)02512-6](https://doi.org/10.1016/S0140-6736(23)02512-6)
- Friel, S., Collin, J., Daube, M., Depoux, A., Freudenberg, N., Gilmore, A. B., Johns, P., Laar, A., Marten, R., McKee, M., & Mialon, M. (2023). Commercial determinants of health: Future directions. *The Lancet*, 401(10383), 1229–1240. [https://doi.org/10.1016/S0140-6736\(23\)00011-9](https://doi.org/10.1016/S0140-6736(23)00011-9)
- Friel, S., Schram, A., Frank, N., Arthur, M., Townsend, B., & Gajurel, H. (2024). Financialisation: A 21st century commercial determinant of health equity. *The Lancet Public Health*, 9(9), e705–e708. [https://doi.org/10.1016/S2468-2667\(24\)00187-7](https://doi.org/10.1016/S2468-2667(24)00187-7)
- Friel, S., Townsend, B., Fisher, M., Harris, P., Freeman, T., & Baum, F. (2021). Power and the people’s health. *Social Science & Medicine*, 282, 114173. <https://doi.org/10.1016/j.socscimed.2021.114173>
- Gilmore, A. B., Fabbri, A., Baum, F., Bertscher, A., Bondy, K., Chang, H.-J., Demaio, S., Erzse, A., Freudenberg, N., Friel, S., Hofman, K. J., Johns, P., Abdool Karim, S., Lacy-Nichols, J., de Carvalho, C. M. P., Marten, R., McKee, M., Petticrew, M., Robertson, L., ... Thow, A. M. (2023). Defining and conceptualising the commercial determinants of health. *The Lancet*, 401(10383), 1194–1213. [https://doi.org/10.1016/S0140-6736\(23\)00013-2](https://doi.org/10.1016/S0140-6736(23)00013-2)

- Graeber, D. (2014). *Debt: The first 5000 years*. Melville House Publishing.
- Graeber, D. (2018). *Bullshit jobs: The rise of pointless work and what we can do about it*. Allen Lane.
- Graeber, D., & Wengrow, D. (2022). *The Dawn of Everything: A new history of humanity*. Penguin.
- Harris, P., Baum, F., Friel, S., Mackean, T., Schram, A., & Townsend, B. (2020). A glossary of theories for understanding power and policy for health equity. *Journal of Epidemiology and Community Health*, 74(6), 548. <https://doi.org/10.1136/jech-2019-213692>
- Heller, J. C., Fleming, P. J., Petteway, R. J., Givens, M., & Pollack Porter, K. M. (2023). Power Up: A Call for Public Health to Recognize, Analyze, and Shift the Balance in Power Relations to Advance Health and Racial Equity. *American Journal of Public Health*, 113(10), 1079–1082. <https://doi.org/10.2105/AJPH.2023.307380>
- Heller, J. C., Givens, M. L., Johnson, S. P., & Kindig, D. A. (2024). Keeping It Political and Powerful: Defining the Structural Determinants of Health. *The Milbank Quarterly*, 102(2), 351–366. <https://doi.org/10.1111/1468-0009.12695>
- Igelström, E., Kopasker, D., Craig, P., Lewsey, J., & Katikireddi, S. V. (2024). Estimating the causal effects of income on health: How researchers' definitions of "income" matter. *BMC Public Health*, 24(1), 1572. <https://doi.org/10.1186/s12889-024-19049-w>
- Krieger, N. (2005). Embodiment: A conceptual glossary for epidemiology. *Journal of Epidemiology and Community Health*, 59(5), 350. <https://doi.org/10.1136/jech.2004.024562>
- Krieger, N. (2011). *Epidemiology and the People's Health. Theory and context*. Oxford University Press.
- Krieger, N. (2014). Discrimination and Health Inequities. *International Journal of Health Services*, 44(4), 643–710. <https://doi.org/10.2190/HS.44.4.b>
- Krieger, N. (2020a). Measures of Racism, Sexism, Heterosexism, and Gender Binarism for Health Equity Research: From Structural Injustice to Embodied Harm—An Ecosocial Analysis. *Annual Review of Public Health*, 41(1), 37–62. <https://doi.org/10.1146/annurev-publhealth-040119-094017>
- Krieger, N. (2020b). Measures of Racism, Sexism, Heterosexism, and Gender Binarism for Health Equity Research: From Structural Injustice to Embodied Harm—An Ecosocial Analysis. In *Annual Review of Public Health* (Vol. 41, Issue Volume 41, 2020, pp. 37–62). Annual Reviews. <https://doi.org/10.1146/annurev-publhealth-040119-094017>
- Lee, H., & Romero, J. (2023). *Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. IPCC.
- Lowery, G. (2026). The Political Economy of Health Inequality. *International Journal of Social Determinants of Health and Health Services*, 56(1), 7–17. <https://doi.org/10.1177/27551938251365072>
- Lukes, S. (2021). *Power. A radical view*. Red Globe Press.
- Lynch, J. (2020). *Regimes of inequality: The political economy of health and wealth*. Cambridge University Press.
- Mandelbaum, J. (2020). Advancing health equity by integrating intersectionality into epidemiological research: Applications and challenges. *Journal of Epidemiology and Community Health*, 74(9), 761. <https://doi.org/10.1136/jech-2020-213847>

- McCartney, G. (2025). *Chapter 6: The level and distribution of income and wealth* (pp. 66–81). Edward Elgar Publishing. <https://doi.org/10.4337/9781035302093.00013>
- McCartney, G., Bartley, M., Dundas, R., Katikireddi, S. V., Mitchell, R., Popham, F., Walsh, D., & Wami, W. (2019). Theorising social class and its application to the study of health inequalities. *SSM Population Health*, 7, 100315. <https://doi.org/10.1016/j.ssmph.2018.10.015>
- McCartney, G., Collins, C., & Mackenzie, M. (2013). What (or who) causes health inequalities: Theories, evidence and implications? *Health Policy*, 113(3), 221–227. <https://doi.org/10.1016/j.healthpol.2013.05.021>
- McCartney, G., Dickie, E., Escobar, O., & Collins, C. (2021). Health inequalities, fundamental causes and power: Towards the practice of good theory. *Sociology of Health & Illness*, 43(1), 20–39. <https://doi.org/10.1111/1467-9566.13181>
- McCartney, G., Hearty, W., Arnot, J., Popham, F., Cumbers, A., & McMaster, R. (2019). Impact of Political Economy on Population Health: A Systematic Review of Reviews. *American Journal of Public Health*, 109(6), e1–e12. <https://doi.org/10.2105/AJPH.2019.305001>
- McCartney, G., McMaster, R., Shipton, D., Harding, O., & Hearty, W. (2022). Glossary: Economics and health. *Journal of Epidemiology and Community Health*, 76(5), 518. <https://doi.org/10.1136/jech-2021-218244>
- McCartney, G., Popham, F., McMaster, R., & Cumbers, A. (2019). Defining health and health inequalities. *Public Health*, 172, 22–30. <https://doi.org/10.1016/j.puhe.2019.03.023>
- Mooney, G. (2012). *The health of nations: Towards a new political economy*. Zed Books.
- Muntaner, C., & Gunn, V. (2019). In Defense of Class Wars in Population Health: The New Landscape of Social Class With Bourdieu, Neo-Marxists, and the Kohn/Schooler/Wright Integrative Models. *International Journal of Health Services*, 49(1), 102–107. <https://doi.org/10.1177/0020731418818409>
- Muntaner, C., Gunn, V., & Prins, S. J. (2025). Alienation: Another contested Marxian construct in epidemiology and public health. *Journal of Epidemiology and Community Health*, jech-2025-223840. <https://doi.org/10.1136/jech-2025-223840>
- Muntaner, C., Ng, E., Chung, H., & Prins, S. J. (2015). Two decades of Neo-Marxist class analysis and health inequalities: A critical reconstruction. *Social Theory & Health*, 13(3), 267–287. <https://doi.org/10.1057/sth.2015.17>
- Navarro, V. (1977). Social Class, Political Power, and the State and Their Implications in Medicine. *International Journal of Health Services*, 7(2), 255–292. <https://doi.org/10.2190/WPNY-UR3N-0DH9-JTA4>
- O'Connor, J. (2022). *Reset: Art, Culture and the foundational economy*. University of South Australia. <https://resetartsandculture.com/wp-content/uploads/2022/02/CP3-Working-Paper-Art-Culture-and-the-Foundational-Economy-2022.pdf>
- O'Connor, J. (2024). *Culture is Not an Industry: Reclaiming Art and Culture for the Common Good*. Manchester University Press.
- O'Connor, R. C., Wetherall, K., Cleare, S., McClelland, H., Melson, A. J., Niedzwiedz, C. L., O'Carroll, R. E., O'Connor, D. B., Platt, S., Scowcroft, E., Watson, B., Zortea, T., Ferguson, E., & Robb, K. A. (2021). Mental health and well-being during the COVID-19 pandemic: Longitudinal analyses

- of adults in the UK COVID-19 Mental Health & Wellbeing study. *The British Journal of Psychiatry*, 218(6), 326–333. Cambridge Core. <https://doi.org/10.1192/bjp.2020.212>
- Pearce, J. (2003). *Social Enterprise in Anytown*. Calouste Gulbenkian Foundation.
- Piketty, T. (2014). *Capital in the Twenty-First Century*. The Bellknap Press of Harvard University Press.
- Piketty, T. (2020). *Capital and Ideology*. Harvard University Press.
- Power, M. (2004). Social Provisioning as a Starting Point for Feminist Economics. *Feminist Economics*, 10(3), 3–19. <https://doi.org/10.1080/1354570042000267608>
- Robinson, M., Chenery, M., & Smith, J. (2026). Beyond Choice: Challenging Individualism in Public Health Narratives. *Health Promotion Journal of Australia*, 37(1), e70125. <https://doi.org/10.1002/hpja.70125>
- Roelfs, D. J., Shor, E., Davidson, K. W., & Schwartz, J. E. (2011). Losing life and livelihood: A systematic review and meta-analysis of unemployment and all-cause mortality. *Social Science & Medicine*, 72(6), 840–854. <https://doi.org/10.1016/j.socscimed.2011.01.005>
- Romanello, M., Di Napoli, C., Drummond, P., Green, C., Kennard, H., Lampard, P., Scamman, D., Arnell, N., Ayeb-Karlsson, S., Ford, L. B., Belesova, K., Bowen, K., Cai, W., Callaghan, M., Campbell-Lendrum, D., Chambers, J., van Daalen, K. R., Dalin, C., Dasandi, N., ... Costello, A. (2022). The 2022 report of the Lancet Countdown on health and climate change: Health at the mercy of fossil fuels. *The Lancet*, 400(10363), 1619–1654. [https://doi.org/10.1016/S0140-6736\(22\)01540-9](https://doi.org/10.1016/S0140-6736(22)01540-9)
- Sayer, A. (2014). *Why we can't afford the rich*. Policy Press.
- Sayer, A., & McCartney, G. (2021). Economic relationships and health inequalities: Improving public health recommendations. *Public Health*, 199, 103–106. <https://doi.org/10.1016/j.puhe.2021.08.017>
- Sen, A. (1999). *Development as Freedom*. Oxford University Press.
- Smith, G. D. (2011). Epidemiology, epigenetics and the ‘Gloomy Prospect’: Embracing randomness in population health research and practice. *International Journal of Epidemiology*, 40(3), 537–562. <https://doi.org/10.1093/ije/dyr117>
- Thomson, H., Thomas, S., Sellstrom, E., & Petticrew, M. (2013). Housing improvements for health and associated socio-economic outcomes. *Cochrane Database of Systematic Reviews*, (2). <https://doi.org/10.1002/14651858.CD008657.pub2>
- West, P. (1991). Rethinking the health selection explanation for health inequalities. *Social Science & Medicine*, 32(4), 373–384.
- Wild, C. P. (2012). The exposome: From concept to utility. *International Journal of Epidemiology*, 41(1), 24–32. <https://doi.org/10.1093/ije/dyr236>
- Winkler, A. S., Brux, C. M., Carabin, H., das Neves, C. G., Häslar, B., Zinsstag, J., Fèvre, E. M., Okello, A., Laing, G., Harrison, W. E., Pöntinen, A. K., Huber, A., Ruckert, A., Natterson-Horowitz, B., Abela, B., Aenishaenslin, C., Heymann, D. L., Rødland, E. K., Berthe, F. C. J., ... Amuasi, J. H. (2025). The Lancet One Health Commission: Harnessing our interconnectedness for equitable, sustainable, and healthy socioecological systems. *The Lancet*, 406(10502), 501–570. [https://doi.org/10.1016/S0140-6736\(25\)00627-0](https://doi.org/10.1016/S0140-6736(25)00627-0)

World Health Organization. (2026). *One Health*. https://www.who.int/health-topics/one-health#tab=tab_1

Wright, E. O. (2010). *Envisioning Real Utopias*. Verso.

Wright, E. O. (2015). *Understanding Class*. Verso.