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# From Engels and Virchow to Wilkinson: an analysis of research on health inequities

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# **From Engels and Virchow to Wilkinson: An Analysis of Research on Health Inequities**

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## **Abstract**

Friedrich Engels and Rudolph Virchow taught us a great deal about the social determinants of health. Their analyses – largely descriptive prose, full of passion and rage – demonstrated with admirable clarity the impact of social structure on the health of individuals. Their work represents the roots of contemporary social research on health inequities. For example, it can be clearly seen in Paul Farmer's conceptualisation of 'structural violence'. But what about contemporary quantitative analyses of health inequities? Taking as an example Richard Wilkinson's income inequality model, this essay explores the links between the classic works of Engels and Virchow and the quantitative approaches now used to examine the social determinants of health.

## **Introduction**

Although not acknowledged in many histories of medical sociology (Bloom, 2002, Cockerham, 2004), the roots of contemporary research on health inequities may be found in the writings of Friedrich Engels (1820 - 1895) and Rudolph Virchow (1821 - 1902). Both authors described the suffering endured by populations, and how that suffering was structured by powerful social forces, including class oppression. The work of both authors posits that ill health is produced by the very way in which society is organized in terms of politics and economics, a theme now widely accepted within research on the social determinants of health (WHO, 2008, Marmot and Wilkinson, 2006, De Maio, 2010).

Consider the following passage from Engels' classic treatise, *The Condition of the Working Class in England*:

When one individual inflicts bodily injury upon another, such injury that death results, we call the deed manslaughter; when the assailant knew in advance that the injury would be fatal, we call his deed murder. But when society places hundreds of proletarians in such a position that they inevitably meet a too early and an unnatural death, one

which is quite as much a death by violence as that by the sword or bullet; when it deprives thousands of the necessities of life, places them under conditions in which they *cannot live* – *forces them* . . . to remain in such conditions until that death ensues which is the inevitable consequence – knows that these thousands of victims must perish, and yet permits these conditions to remain, its deed is murder... (Engels, 1987 [1845]: 127, emphasis in original)

His charge is that society murders the poor by allowing – in his view, forcing – them to live in conditions wherein unnecessary morbidity and premature mortality are bound to occur. For example, his analysis documents the pathogenic effects of poor working conditions, unsafe and unsanitary housing, unequal access to the services of trained physicians, and the predatory practices of companies seeking to profit from ineffective and often-times harmful “treatments” and “cures”. His analysis remains remarkably relevant to our twenty-first century world; with but a few changes, his description of the health effects experienced by the English working class in 1845 applies to the majority of the world’s population today (Kim et al., 2000). Engels argued for social change, but explicitly warned that a mere expansion of medical services would not be sufficient. Instead, he called for a socialist revolution, and argued that nothing short of worker control of the means of production would be needed if the health of the working class was to be improved.

Similarly, Virchow’s classic report on an outbreak of typhoid in Upper Silesia focussed on the material factors that lead to the spread of the disease (Virchow, 2006 [1848], Waitzkin, 2006). In the winter of 1847–1848, Upper Silesia, an economically depressed Prussian province, experienced a famine that affected tens of thousands of people. Typhus (a potentially fatal infectious disease that is spread amongst humans by lice and fleas) reached epidemic levels. In his report on the outbreak, Virchow is adamant that the typhus epidemic and the famine were inter-related and that to understand one or the other, you had to understand Upper Silesia’s social–political history and structure. Virchow’s report describes a materially deprived and politically apathetic population, noting that

...they were poorer and more ignorant, more servile and submissive than almost any other people in the world; they had lost all their energy and self-confidence . . . In Ireland the people fought back, armed and unarmed, when their conditions became unbearable. They appeared on the battlefield, rebellious against law and property. In Upper Silesia they starved to death in silence. (Virchow, in Taylor and Rieger, 1985: 205-206)

Whilst acknowledging the medical features of typhus, Virchow emphasised that social context ultimately shaped its contagion and effect on the population. His report explicitly focused on material conditions such as poverty, housing, diet, and sanitation. His analysis pointed towards “education, together with its daughters, freedom and welfare” (Virchow, in Taylor and Rieger, 1985: 206) as the best way to prevent future typhus outbreaks. Virchow returned from Upper Silesia in March 1848 and quickly joined the revolutionary movement in Berlin. He contributed and co-edited *Medical Reform*, where he argued that “Medical statistics will be our standard of measurement: we will weigh life for life and see where the dead lie thicker among the workers or among the privileged” (see Taylor and Rieger, 1985: 203).

## **From Engels and Virchow to “Structural Violence”**

A clear modern-day manifestation of Engels’ and Virchow’s analytical frame can be found in the work of Paul Farmer, the noted infectious disease specialist and medical anthropologist. Farmer describes his work as ‘geographically broad and historically deep’ ethnography, and whilst his analyses of health inequities in rural Haiti, urban Peru, Chiapas, Russian prisons and Rwanda may at first seem far removed from Engels and Virchow, they all share elements of historical materialism and all revolve around the concept of *structural violence*. Farmer defines this concept as “a host of offensives against human dignity: extreme and relative poverty, social inequalities ranging from racism to gender inequality, and the more spectacular forms of violence that are un-contestedly human rights abuses, some of them punishment for efforts to escape structural violence” (2003: 8). Elsewhere, he notes that structural violence refers to “social arrangements that put individuals and populations in harm’s way [...] the arrangements are *structural because they are embedded in the political and economic organization of our social world*; they are *violent because they cause injury to people...*” (Farmer et al., 2006: 1686). Like Engels and Virchow before him, Farmer argues that medical services – whilst incredibly important in many cases – cannot by themselves overcome the pathogenic effects of poverty and social inequality. And also like Engels and Virchow, Farmer’s analysis is predominantly qualitative and historical in nature; he does not rely on statistical analysis, relying instead on his own experience in the clinical setting and ethnographic accounts of his patients’ lives. In many ways, Farmer’s work highlights the difficulties associated with adopting such a radical frame within contemporary research; current debates surrounding tuberculosis and HIV/AIDS, for example, often

have little to do with political economy and instead focus on issues of medication noncompliance in apolitical and ahistorical ways. In *Infections and Inequalities*, Farmer (1999) openly laments: “Where are the Virchows of global public health?”

## **Contemporary Quantitative Approaches to Health Inequities**

Wilkinson’s income inequality hypothesis is arguably one of the most important attempts in recent decades to examine health inequities using quantitative methods. Broadly defined, the hypothesis asserts that “an individual’s health is influenced not only by their own level of income, but by the level of inequality in the area in which they live” (De Maio, 2010: 60). Best developed in Wilkinson’s (1996) *Unhealthy Societies: The Afflictions of Inequality*, the income inequality model has been tested in over 150 empirical studies (for comprehensive reviews of that literature, see Lynch et al. (2004), Wilkinson and Pickett (2006), along with Kawachi, Kennedy, & Wilkinson (1999)). Most recently, Wilkinson and Pickett’s (2009) publication of *The Spirit Level* has brought renewed attention to the model.

One of the clearest quantitative studies of the income inequality model was published by Ross et al (2000) in the *British Medical Journal*. Their analysis compared the health effects of income inequality in the United States and Canada, both at the state/provincial level (bivariate analysis) and at the level of metropolitan areas (bivariate and multivariate analysis using multiple regression). Income inequality was defined as the percentage of total household income received by the poorest 50% of households, a commonly used indicator (De Maio, 2007). Population health was operationalised as age-adjusted all-cause mortality.

Building on bivariate correlation analyses, Ross et al developed an ordinary least squares (OLS) regression model to estimate the impact of a 1% increase in the proportion of income earned by the poorest 50%. Their results suggest that such an increase leads to a decline of 21 deaths per 100,000 per year for the working age population. Importantly, this finding was robust to the inclusion of a city’s median income as an additional independent variable (with the coefficient associated with median share changing from -21.71 to -21.80 in their US-only models). Ross et al also detected important differences between the United States and Canada, with the Canadian data showing overall lower income inequality and lower mortality than the US data. Their combined US-Canada analyses (which contained a dummy variable for Canada) indicated a strong pathogenic effect of income inequality (resulting in an  $R^2$  of 0.51), as did their US-only

models; however, their Canada-only analyses indicated that inequality was not significantly associated with mortality in that country. Ross et al note “after the three main effects variables (median share, median income, and the dummy country indicator) and all two way interactions in the Canada and US models were accounted for, the slope of the relation between median share and mortality in Canada was not significantly different from zero” (2000: 901).

Ross et al appropriately concluded that “the absence of an effect within Canada may indicate that the relation between income inequality and mortality is non-linear (that is, at higher levels of equality there is a diminishing effect on health) or that the relation between income inequality and mortality is not universal but instead depends on political characteristics specific to place” (2000: 901). They go on to note that “another major difference between the two countries is the way in which resources such as health care and high quality education are distributed” (2000: 901). Alternative interpretations of the results could focus on the notion of *constrained variance*, as the observed ranges of both inequality and mortality in the Canadian data were substantially smaller than in the US data.

The language of the Wilkinson income inequality model reflects its quantitative nature: hypothesis, variables, measurement, operationalisation, model building, coefficient, and r-squared. On the surface, it is therefore very different from what we can read in Engels and Virchow, and more recently, in Farmer. Yet these authors, despite widely different methodologies and epistemologies, all write about health inequities, or inequalities that are ‘avoidable, unnecessary, and unfair’ (Whitehead, 1992). They all focus on social conditions as determinants of population health.

However, the link from Engels and Virchow to Wilkinson (for example, as ‘tested’ by Ross et al) appears broken by ‘frame’ of their analyses. Consider the following comment from Himmelstein (originally written in a review of Vicente Navarro’s work but equally applicable in this context):

. . much recent empirical work on inequalities in health is, in essence, a statistical restatement and verification of this tradition [early socialist scholarship on poverty and health]; Virchow and Engels’ prose descriptions have been translated into the modern scientific language of epidemiology. *But in the translation from socialism to epidemiology, something has been lost.* In analysing typhus, Virchow found the social seeds of disease and prescribed the overthrow of a social system . . . Too often, today’s researchers describe the phenomenology of inequality and injustice, but leave its origins and perpetrators obscured . . . They would redistribute

wealth, but not renounce the market relations and property rights that engender inequality.” (Himmelstein, 2002: 1279-1280; emphasis mine)

It is true that Wilkinson and other researchers in this field such as Ross et al are not calling for large-scale revolution. Himmelstein clearly laments this change in the nature of the research on health inequities. But perhaps something has been gained in this transition as well. Whilst not renouncing market relations and capitalism, the analyses offered by Wilkinson and Ross et al speak to the very significant reductions in avoidable morbidity and mortality that may be achieved with very minor changes in public policy. Indeed, Ross et al’s regression analysis indicates that a 1% increase in the proportion of income earned by the poorest 50% of the population could result in 21 fewer deaths per 100,000 working age people per year. That is a remarkable figure – particularly if we consider what this would amount to if accrued across a large city for a generation.

Admittedly, this is a far cry from Engels and Virchow – the story of Wilkinson’s income inequality model is not one of proletarians breaking their chains and controlling the means of production. Instead, it is a story of how very small changes within the capitalist system may nevertheless yield a more equal and humane society.

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