

Issues in the measurement of social determinants of health

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Abstract

This article focuses on the measurement of the social determinants of health, and specifically on issues relating to two key variables relevant to the analysis of public health information: poverty and inequality. Although the paper has been written from the perspective of economics, the discipline of the two authors, it is also of relevance to researchers in other disciplines. It is argued that there is a need to ensure that, when considering measurement in this largely neglected area of research, sufficient thought is given to the relationships that are being examined or assessed. We argue further that any attempt at measurement in this area must take into account the historical backdrop and the complex nature of the relationships between these key variables.

Keywords (MeSH):

Public Health; Epidemiologic Determinants; Social Environment; Social Class; Socioeconomic Status; Equity; Poverty; Measurement.

Introduction

This paper focuses on two key social determinants of health, as discussed by Wilkinson and Pickett (2006), namely, poverty and inequality. Within that context, the paper concentrates on two largely conceptual questions: (a) how poverty and inequality are best interpreted when seeking to assess their impact on health; and (b) what in turn this means for information requirements. First, issues surrounding public health information are examined, primarily from the perspective of health economics, but pertinent to other closely related fields. We then examine the social determinants of health, focusing in particular on poverty and inequality. The nature of the relationship between poverty and inequality on the one hand, and health on the other, is the subject of the final section. In conclusion, it is stressed that even if reliance still has to be placed on some crude proxies for public health information in measuring poverty and inequality (such as income), an understanding of the complexities of the underlying relationships between these measures and health means interpretation of results will tend to be better informed and more cautious.

Issues surrounding public health information

Information in public health is critical at a number of levels. In one sense, public health *is* information. It involves informing the public about how to make healthy choices in the ways in which they run their lives. For example, an anti-obesity campaign is, in effect, an information campaign. In other instances, information is critical to the support of public health interventions. Women will not attend for screening for breast cancer if they are not informed about the benefits of such screening, and if they are not told where to go for screening. Information can also be used to reassure the community in a public health campaign. Much of the emphasis in the public health approach to avian influenza was, and continues to be, on providing information to the public with the intention of avoiding panic in what could easily become a very worried populace. Upon occasion, public health information may be used to worry people deliberately; an example of this tactic is the circulation of the 'smoking kills' message. However, public information campaigns can, at times, create unintended anxiety. The very advertising of a breast-screening

clinic, for example, may induce worry in some women.

As health economists, our prime interests in public health information are twofold: (a) public health information can have a direct impact on people's wellbeing by making them more or less anxious; and (b) information is important in helping authorities to make better decisions about resource allocation. Availability of better quality and greater volume of information can result in more efficient and equitable decisions, which can in turn lead to provision of more health services and fairer distribution of these services.

It follows that the pursuit of the health of populations and of efficient and equitable health services will be characterised by competition for resources. It is unfortunate that within the context of resources in healthcare systems, public health often struggles to compete successfully with health care per se for additional resources. One can speculate as to why this is the case, but there does seem to be some sort of 'pecking order' for the strength of claims to healthcare resources that are not necessarily related to questions of improving allocative efficiency (i.e. maximising health or other benefits within available resources) or furthering equity. These appear to be determined by the structure of what economists call 'property rights' in health care (Furobntn & Pejovich 1972). In essence, this refers to whose voices are heard when resources are being allocated. *The power relationships within health care are such that the large teaching hospitals tend often to win the lion's share of resources. These are followed in descending order of influence by other hospitals, primary health care and community health services, with public health coming in a lowly last place.*

Understanding this power structure matters. This is especially the case when it comes to information and evidence. Evidence-based medicine – and more precisely quantified evidence-based medicine – has become part of the evaluative scene in health care in recent years (Kristiansen & Mooney 2004). Overall, that is to be welcomed, at least in principle. However, it is potentially problematic for public health because it has to compete for resources with, inter alia, clinical medicine. It is so much easier to obtain good data (sometimes from a randomised control trial) on

the clinical and cost effectiveness of, for example, a new drug for treating cancer than it is for a campaign to promote safe sex. There is often much more 'noise' in the case of a public health intervention, less certainty about the etiology of the disease in question, and a less clear-cut or less well-defined outcome. Changes in mortality, chances of survival, and improvements in individuals' health are all more easily assessed than relevant public health variables, such as increased community reassurance or preparedness (Rand Corporation 2007).

Poverty and inequality as social determinants of health

When we shift our focus within public health to try to deal with the social determinants of health, the position becomes yet more problematic. Too little attention is paid to the fact that not only is relevant information even harder to come by in an appropriate form but too little thought is given to what is meant by 'relevant' in this context. The competition for resources at this level is now perhaps even more difficult for public health to compete successfully against other healthcare interests. Housing, education, the economy as a whole all can have an impact on health in general. However, the extent to which decision-makers in these areas acknowledge that and see their role in any way as being to pursue health promoting policies is almost certainly sub-optimal. *Making adequate and relevant information available becomes paramount if health policy makers (and these are clearly a wider group than health care policy makers) are to embrace adequately the prospects of attracting investments in and, equally important, interest in the social determinants of health.*

Though poverty reduction is widely recognised as a recommended goal for economic development, a plethora of policy recommendations often emerge along the lines of the conceptual definition given to the term 'poverty'. This has particular relevance to the subject of information in public health, because the understanding that is communicated by the given definition acts as a pointer to the direction in which health policy must be enacted. In addition, the extent to which the recommended health policy action actually impacts upon the health of the targeted group

will depend on how well the defined measure of poverty captures the 'real' impact of poverty as a social determinant of health.

The World Bank defines poverty according to the lowest level of income that is necessary for purchasing a subsistence basket of goods, currently set at \$1 per day income per capita for the poorest countries. This follows an 'absolute poverty' approach that explains the concept according to some defined threshold considered necessary for individuals to meet their current needs. Three ingredients are considered necessary to compute a poverty measure according to this approach: a relevant indicator of wellbeing; a threshold (poverty line) below which the individual will be considered poor; and a poverty measure (Coudouel, Hentschel & Wodon 2002). Indicators of wellbeing could be monetary (e.g. income and consumption) and non-monetary (e.g. health and nutrition, education or a composite index of wealth). Since the literature on income and health is based on a variety of measures of income, it follows that it is difficult to pinpoint the impact of poverty and inequality upon health.

In contrast to the absolute approach to poverty assessment, the relative approach defines poverty in terms of its relation to the standards that exist elsewhere in society. In the Luxembourg income study, poverty is measured as a proportion (less 50%) of the average disposable income per capita, while in Armenia the government's poverty line has been fixed at 40% of median per capita expenditure, with 27% of the population living below this line counted as poor (Subramanian, Belli & Kawachi 2002).

Inequality is a measure of welfare that is considered in relative terms, evaluating the endowments such as income of one segment of the population in conjunction with the endowments of another. Inequalities could also be measured for other variables such as health status or power. Common indices for measuring inequality within a society include the Gini coefficient of inequality, the Theil index, the Decile dispersion ratio and the share of income or consumption of the poorest x per cent of the population. The Gini coefficient is a measure of statistical dispersion most prominently used as a measure of inequality of income distribu-

tion or inequality of wealth distribution. It is defined as a ratio with values between 0 and 1; a low Gini coefficient indicates more equal income or wealth distribution, while a high Gini coefficient indicates more unequal distribution. Zero corresponds to perfect equality (everyone having exactly the same income) and 1 corresponds to perfect inequality (where one person has all the income, while everyone else has zero income). There are different measures of income inequality that place emphasis on particular parts of the income distribution. The Gini coefficient for example is more sensitive to changes at the top, while Theil measures are more sensitive to income inequality at the bottom of the income distribution (Judge & Paterson 2001). These measurement issues make it even more important to pay careful attention to the availability, adequacy, and relevance of information for public health policy formulation.

Poverty of what? Inequality of what?

What measures are best for considering the impact of poverty on health? Are we talking about the influence on health only of income inequality or some wider construct of inequality? To answer these questions, a more detailed look at these two major social determinants of health is required. Just what is their impact on ill-health, and what are the causal links between poverty and ill-health and between inequality and ill-health?

There are many ways in which the issues of poverty and inequality can affect health, the most obvious one with respect to poverty being infant mortality. But asthma in children, and in adults bronchitis and arthritis, are some others for which there can be a relationship with poverty (Queensland University of Technology and the AIHW 2006). The impact of inequality on health again manifests itself in many ways, as Wilkinson (2005) reported; for example, it is significant that more unequal societies are often more physically violent.

Poverty

It is commonly observed across nations that poorer countries have lower levels of average health achievements. Subramanian et al. (2002) argued that there are cogent grounds to believe that at the individual level, lack of income is

causally linked to poorer health. This is justified by the fact that higher incomes provide a greater command over many of the goods and services that promote health, including better nutrition, access to clean water, sanitation, housing and good quality health services. Therefore, poverty is an important cause of preventable death, disease, and disability.

Income has an impact on health since it grants the opportunity to obtain the fundamental prerequisites for health, such as shelter, food, warmth, and the ability to participate in society (Judge & Paterson, 2001: 6). Low incomes increase an individual's exposure to harmful environments, such as inadequate housing. Judge and Paterson (2001) also noted that income levels affect the way parents make family health decisions for themselves and their children, with parents sometimes forced to prioritise children's health needs over their own. Poverty reinforces health-damaging behaviour and the psychological stress associated with deprivation can trigger biological stress responses within the individual that have evident health consequences, especially if prolonged.

Thus low income can have a direct material bearing on ill-health but the reverse is also true. Deaton (2003) argued that among the poorest countries, increases in average income are strongly associated with increases in life expectancy, but as income per head rises, the relationship flattens out and is weaker or even absent. The 'reverse pathway' argument draws upon theories of economic growth that view 'being healthy' as important human capital, which is both relevant for income generation in terms of personal earnings and useful for economy wide productivity. This view gained prominence in the 1990s with the WHO Commission on Macroeconomics and Health (CMH) leading to the conclusion that a healthy population is a critical input into poverty reduction, economic growth, and long-term economic development. This is because, by avoiding premature deaths, chronic disability and disease, the economic losses to society are limited. This view comes from macroeconomic evidence that countries with the weakest conditions of health have a much harder time achieving sustained growth than countries with better conditions of health,

while other studies suggest that 40% of the economic growth in developing countries can be ascribed to improved health and nutritional status (Subramanian et al. 2002).

One strand of the literature argues that while there is an association between income and health, any causality between income and health only manifests itself through the intervention of third factors that can be subsumed under the heading of the impact of income on socio-economic status. This literature tends to see income as a 'marker' for an underlying concept of socio-economic status or class, and it is this rather than income per se that is treated as the cause of health discrepancies. Other related markers used include wealth, consumption expenditure, earnings, rank, power, social or occupational class, education, race and geography (Deaton 2003).

Additionally, it is important to recognise the crucial role that wealth plays in living conditions and the quality of life. However, the health-enhancing impact of economic growth is dependent upon government policies on public health expenditure and social services provision. There are examples of countries whose growth record is not exceptional, but who possess exceptional human development and health outcomes (e.g. Cuba and the Kerala province in India), while there are other more prosperous countries that do not have good human development and health records (such as the United States). This phenomenon appears to be a result of differences in social arrangements and community relations in these communities.

Thus Sen distinguished between what he called growth mediated and support-led progress.

The former works through fast economic growth and its success depends on the growth process being wide-based and economically broad...and also on the utilization of the enhanced economic prosperity to expand the relevant social services, including health care, education and social security. In contrast ... the 'support-led' process does not operate through fast economic growth but works through a programme of skilful social support of health care, education, and other relevant social arrangements. Sen (2001: 338)

Inequality

In assessing the impact of inequality, the evidence is mixed in terms of whether inequality is bad for health. (See, for example, reviews by Deaton 2003; Lynch, Davey Smith, Harper & Hillmeier 2004; Lynch et al. 2004). However, a more recent review of the evidence is revealing. Wilkinson and Pickett (2006: 1769) reviewed 168 analyses that investigated the relationship between income inequality and health. Out of the total of 168 analyses, 87 were wholly supportive, 44 were partially supportive, and 37 were unsupportive of the hypothesis that income inequity and poor health are related. These authors then examined the 168 analyses again in more detail, to see if they could form a theoretically coherent overview of the literature, by identifying patterns in the findings, and the likely implications of each pattern. What they found is important in the context of this article, namely, that:

income distribution is related to health *where it serves as a measure of the scale of social differences in a society* (emphasis added). ... In small areas where income inequality is unlikely to reflect the degree of social stratification in the wider society, it is less likely to be related to health. (Wilkinson & Pickett: 1778)

The authors added that 'the suggestion that the per cent of the population who are black explains away the income inequality relation at state (if not county) level in the USA, has been regarded by some as a falsification of the inequality hypothesis (Deaton 2003). However, we think it comes closer to being a confirmation of the underlying view that *what matters is the extent of social class differentiation*' (emphasis added) (Wilkinson & Pickett 2006: 1778).

This suggests that with respect to inequality and health, the issue is not strictly inequality of income per se but class, where class is used to categorise people in terms of their position in the economic system. The working class has only labour to offer in the market place, which places them at a power disadvantage compared with those who own capital and thereby have much more social and economic power. This places inequality firmly in the context of power structures.

Coburn (2000) also adopted a class-based analysis in his study of health and inequalities. He argued that:

[his] political economy approach ... links [the] study of the health effects of income inequality with social and class changes including the spread of neo-liberalism, the decline of the welfare state, differences amongst nations regarding welfare regime type, and, most generally, the relationships between class structure, economies and human well-being. (Coburn 2000:140)

Navarro and Shi (2001) endorsed the thrust of these arguments on class. They concluded:

First, political variables such as the political party in government ... for longer periods of time are important in influencing a country's level of income and social inequalities and its health indicators such as infant mortality. Second, these political forces represent the interests of classes and other social forces with different interests in redistributive policies. (2001: 490)

Sen on inequality and poverty

Another way to examine the impact of poverty and inequality on health is to ask: What interests of a person might be damaged by poverty and/or inequality that could be deleterious to their health? Sen (1992) examined this question of what constitutes a person's interests in this context, and suggested that the use of income per se in measuring both poverty and inequality had deficiencies. To follow Sen's argument, a number of concepts need clarification. Sen was writing in a very specific context, his focus being on judging a person's interests rather than on actions or behaviour. He was not looking for one single magic solution to the question of measurement of a person's interests, arguing that *one* such measure of interests, superior to all others and applicable in all contexts, was unlikely to be found. Sen's answer was to think in terms of what he referred to as 'functionings' and 'capabilities'. He wanted to go beyond income and commodities in the conventional economics sense. He recognised that individuals are different in terms of their abilities to convert commodities into ways of providing themselves with wellbeing, so that even if goods were allocated equally across different individuals,

this would not equalise functionings and consequently would not equalise wellbeing. These ways are what Sen called functionings. An individual's functionings are what he or she manages to do or to be. Capabilities represent the freedoms that an individual has in terms of the choice range that individual has of functionings. Thus, functionings can be seen as realised capabilities, with whatever capability chosen then being a functioning, because that is what the person achieves.

Sen (1985: 23) suggested that the concept of income suffers from two problems: 'physical-condition neglect' and 'valuation neglect'. A person who suffers from the physical condition of neglect (e.g. is undernourished) can still be high on the scale of happiness or desire-fulfillment if he or she has learned to have 'realistic' desires and to take pleasure in 'small mercies'. Further, Sen (1992: 149) claimed with respect to valuation neglect, that valuing is not the same as desiring, and that the strength of desire is influenced by considerations of realism in one's circumstances. He argued further that an overdependence on what people 'manage to desire' is one of the limiting aspects of an ethic based on income, which neglects the claims of those who are too subdued or broken to have the courage to desire much. Thus, income is too crude a measure of what we actually seek in assessing the impact of both inequality and poverty on health.

Being poor almost certainly affects people's conception of the reality of their circumstances. In an unequal society there may be an attempt on the part of those at the bottom to climb up the ladder. That is, in a sense, to be admired. However, to be thwarted may well create problems, some of which may manifest in terms of ill-health.

Contexts for poverty and inequality

In assessing and seeking to measure the impact of poverty and inequality on health, it is necessary to put these into some context. As indicated, this can involve a number of dimensions. It can also be partly historical. One aspect of history immediately recognisable to an Australian audience is the poverty and inequality faced by Aboriginal people, where income poverty exists within an overall context of cultural poverty. The inequality that Aboriginal people face is greater than purely income-based. There are differences, for example,

in power relations between the dominant group (non-Aboriginal Australians) and the Aboriginal community. The powerlessness of Aboriginal people leads to a loss of autonomy, which in turn is likely to be deleterious to their health.

Even if consideration were restricted to income alone, it may matter if the source of income is in part from social benefits. Where such benefits are available to the poor, these not only boost their incomes and reduce both poverty and inequality but imply that a society is concerned about redistribution in some compassionate way. Mooney (2005) has looked at this issue in earlier work on compassion and drug addiction.

The presence of a social compassion may also be relevant in any assessment of poverty and inequality. Being cared for and being cared about would intuitively be likely to influence health. Martha Nussbaum (2001) has written in the context of rich and poor nations, but the same point holds for rich and poor within a single society that compassion can be a force when we reflect 'about the duties of rich nations toward poor nations, in promoting both political and economic well-being' (Nussbaum 2001: 403).

In conclusion

The questions: Poverty of what? Inequality of what? need to be addressed. They have no simple answers and when they are answered, they will almost certainly be situation specific. Clearly, careful thought is needed when it comes to measuring social determinants of health and in choosing relevant and appropriate information to conduct such measurement.

Fortunately in Australia, the Australian Bureau of Statistics (ABS) and the Australian Institute of Health and Welfare (AIHW) are aware of many of the problems in this area and have begun to grapple with them. The Diversity Health Institute Clearing House (n.d.) and the Public Health Information Development Unit (PHIDU) (n.d.) are other useful sources of data for those seeking to confront the issues of measuring the social determinants of health. However, the issue here is not just one of measurement, but also how best to conceptualise the issues. Possible frameworks that may be useful are offered by Turrell et al. (1999) and by Wilkinson (2005).

Poverty and inequality matter to the health of people; they influence public health. However, they are complex variables, and ideally there needs to be some close understanding of their interactions with and influences upon health. That understanding needs to precede measurement. By all means, in examining these key social determinants of health, bring quantitative measurement to bear, but precisely which quantitative measures to use needs to be thought through in some detail.

It may be the case that any public health information will need to rely on some available and sometimes crude indicators. In the measurement of poverty and inequality, income may be all we have to go on. What is then needed is to be cautious about the interpretation that is placed upon any results based on such analyses.

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