

## Perspective and Debates

## Public health and economics: a marriage of necessity

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## Significance for public health

Public health is an important subject which requires the application of the discipline of health economics to facilitate the identification of cost effective interventions to improve public health. Without this targeting public health investment is faith based rather than evidence based.

## Abstract

With resources always scarce, limited resources have to be targeted at those interventions, prevention and cure, that give the greatest population health gain at least cost. Mere identification of *what works* in prevention is inadequate unless this evidence is supplemented with economic analysis that identifies what is cost effective. Public health without the use of economics is incomplete.

## Introduction

All countries have to make difficult choices about how to allocate scarce resources amongst competing uses. Everywhere there is continuous debate about the size of the public sector and the need to balance this against the funding of a vigorous private sector. Within the public sector difficult choices have to be made between and within *essential* services such education, defence and health care. The health care sector consumes ten per cent of national income in many countries. It is characterised by increasing demand due to the ageing of populations and technological change, rising expenditures and a debate about the relative roles of curative medicine and investments in public health.

An appealing analogy is that investment upstream on prevention would save subsequent expenditure downstream on care and cure. But is prevention better than cure, and if so which interventions offer the greatest benefit to patients at least cost? Given the universal scarcity of resources, economic recession and austerity, answers to this crucial question remain elusive. How can knowledge about the relative productivity of investing in curative and preventive care be improved?

## The distinction between a discipline and a subject

A discipline is a way of analysing the world which creates hypotheses that are subject to empirical testing. It is a mode of thinking that facilitates the use of particular concepts and relationships that can be used to ask questions and collect data. Over time such work creates a

body of knowledge that can be taught and augmented.<sup>1</sup> Examples of social science disciplines particularly relevant to the production of health and health care are psychology, sociology and economics.

A subject is an area of discourse where disciplines are deployed to increase understanding. History, medicine and public health are three areas which can be called subjects. These topics can be explored using social science disciplines. For instance Fogel and Engerman<sup>2</sup> postulated that slavery in the USA was economically efficient (if morally repugnant). They used economic techniques and data to explore historical data and reach their conclusions.

Social medicine, community medicine and public health are three titles of discourse on the subject of health production. Many decades ago it was defined by Holland<sup>3</sup> as a subject that *covers the organisation and evaluation of health care systems and the medical aspects of the administration of health care service*. Nowadays the subject *public health* covers not only the production and distribution of health care but also the production and distribution of health.

The subject of public health involves use of a broad range of activities, only some of which are disciplines e.g. epidemiology, statistics, sociology, social policy, public administration, management, psychology, operations research and planning. Of these some are disciplines and some are not e.g. epidemiology which involves the analysis of the causes and distribution of disease in populations rather than individuals is a discipline like the social sciences. However social policy and management are topics like public health. The vigour and success of a subject such as public health depends on the complementary use of a range of disciplines. The choice of the particular discipline depends on the question to be addressed. Public health exhibits a peculiar deficiency: the relative neglect of the use of economics. The poor exploitation of the discipline of economics by public health practitioners is epitomised by the Marmot report.<sup>4</sup> This report was commissioned by the Labour Government and focused the identification of inequalities in health in the United Kingdom and how these long established variations could be reduced. The report concluded that investment in remedial policies was required in six areas: *give every child the best start in life; enable all children, young people and adults to maximise their capabilities and have control over their lives, create fair employment and good work for all; ensure a healthy standard of living for all; create and develop healthy and sustainable places and communities; strengthen the role and impact of ill health preventions*.

This list whilst appealing at a general level is extraordinarily vague. It begs answers to two crucial questions that can only be answered by economic evaluation of competing investments in public health. Firstly how are these policy objectives ranked? Secondly what trade-offs are there within and between each group? Answering these questions requires collaborative use of techniques of economic evaluation. Failure to address these issues leaves decision makers ill informed about how to prioritise investments in the production of health. Such ignorance is not bliss as it is likely to waste scarce economic resources and frustrate improvements in public health and reductions in health inequalities.

## The myopia of public health

### The poverty of the effectiveness evidence base

Public health is a subject area of great policy importance but its development has been myopic. Returning to the issue of health inequalities, where the United Kingdom and the United States have despite their relative affluence some of the greatest health inequalities in the developed world, there continues to be political and social concern but a failure to develop evidence based remedial policies. In the UK there have been a series of reports over decades: the Black report,<sup>5</sup> the Acheson report,<sup>6</sup> and more recently the Marmot report.<sup>4</sup> These reports have offered great detail about differences in mortality and morbidity of rich and poor groups, exploiting cross section and cohort data. Each of these UK reports has described in great detail the differences in life expectation, mortality and morbidity of rich and poor social groups. Each report has attracted high levels of public interest and political agreement that such inequalities should be reduced. However a characteristic of this very pertinent work has been an absence of detail about which types of investment would be most efficient in reducing health inequalities.

For instance, with a child born today in deprived Glasgow in Scotland having a life expectation at least a decade less than a child born in affluent Kensington and Chelsea in London, the policy question is how can that inequality be reduced best at least cost? The answers given by the public health-social epidemiology literature are poor. For instance is it best to target resources at young children and develop in their first three years of life their cognitive and non cognitive skills, thereby enhancing their life time earnings potential and capacity to invest in health activities? If the answer to this question is yes, which policy interventions are most cost effective? Investing in health production in this way implies relative neglect of older children and adults, leaving them to their fate and premature death and excess morbidity during their lifetimes. Where is the evidence that this is an efficient policy?

In both the public health and the economics literature on the reduction of health inequalities there appears to be a consensus that investment in interventions in the early years, particularly pre-school, are likely to be more efficient. Investment later, for instance in teenagers, is unlikely to be good value for money as their cognitive and non cognitive skills may be difficult to improve compared to those in early life.<sup>7</sup>

The public health-social epidemiology approach to inequality if it neglects economics will continue to be myopic, providing a diagnosis but little insight into the efficient treatment of the problem. How can economics and public health be *married* or better integrated to produce more efficient and comprehensive public policy.

An essential first step is the identification of interventions that are demonstrably effective. This task is not easy as the literature is often poor in terms of trial design and reporting. For instance Katikireddi and colleagues<sup>8</sup> have analysed a recent English policy document which espouses investment in those interventions that are effective. They show how current politicians offer the rhetoric of funding only those investments that are demonstrably effective. However despite their good intent, Katikireddi and his colleagues show that the quantity and quality of evidence of effectiveness is limited and some government policies lack an evidence base of effectiveness. They appraise evidence for a range of policies: early years, physical activity, food, community interventions, and inequalities and show the limits of the evidence base.

The result of poor evaluation of effectiveness of public health interventions is that policies tend to be based on faith rather than evidence. This is epitomised by advocacy of smoke free environments. Does the banning of smoking in public places such as restaurants and bars reduce tobacco consumption? A study comparing smoke free legislation in Scotland with England prior to its banning smoking in public places has

shown that it had no effect on tobacco consumption in Scotland.<sup>9</sup> The policy may have reduced passive smoking mortality and morbidity, for which there is no comparable data, and improved environmental cleanliness but its effect on tobacco consumption appears to be zero. This analysis demonstrates nicely the need to evaluate policies carefully.

### The poverty of the cost effectiveness evidence base

Evidence of effectiveness is a necessary but not a sufficient criterion for investment in the production of health in the curative or the public health sectors. What is effective may not be cost effective but what is cost effective is always effective.<sup>10</sup>

Assume that intervention A produces 50 quality adjusted life years (QALYs or years of good quality life) and intervention B produces 250 QALYs. The myopic medical paradigm, and the patient or beneficiary from such investment would choose intervention B as it produces the best outcome i.e. 200 more QALYs than investing in intervention A.

However, this conclusion is premature as it ignores the cost of the alternatives. All investment decisions involve an opportunity cost i.e. a decision to spend on one option deprives the beneficiaries of another option of benefits. All investment choices involve foregoing benefits from programmes not financed.

If we assume that intervention A costs £500 and intervention B costs £5000, this means that A produces each QALY at the cost of £10 whilst intervention B produces each QALY at a cost of £20. If the programme budget is £100000, intervention A which is least effective produces 10000 QALYs whilst intervention B (the more effective) produces only 5000 QALYs.

Thus when investing in health care, curative and public health, evidence is needed of effectiveness and cost effectiveness of competing interventions. Katikireddi and colleagues<sup>8</sup> show how the effectiveness evidence base is generally quite limited. They could have usefully developed their argument and noted more thoroughly that the cost effectiveness evidence base is even poorer.

### Why is the evidence base poor?

Why is the quality of effectiveness and cost effectiveness research in public health so poor? It seems that the lessons disseminated by the Cochrane Collaboration ([www.cochrane.org](http://www.cochrane.org)) have failed to affect practice in public health. The quality of trials and systematic reviews are inadequate to inform public policy making. The problem, as Chalmers has emphasised in his criticism of research in curative medicine, is not lack of resources but the poor quality of research work.<sup>11</sup>

However, public health research is not easy to design and implement. The literature exhibits a tendency to select multiple end points for appraisal when single end points might be preferred. The benefits of public health interventions may accrue over decades. How long should trials continue e.g. when measuring tobacco quit rates success within the year may be cancelled out later by smoking resumption?

Costing interventions for essential cost effectiveness studies is essential but difficult. However health care systems generally have poor unit cost data as audit and performance management systems tend to be focused on macro expenditure control i.e. staying in budget. What costs should be included in an evaluation? Should it focus on the costs to the local health service? Or should health service costs and costs to the patient and their carers also be included? The English National Institute for Health and Clinical Excellence (NICE) is required to carry out technology and public health appraisals focused only on the costs to the NHS of the competing interventions and ignores broader social cost issues.

Another complex aspect of economic evaluation which is particularly acute in public health is the discounting costs and benefits. The fundamental issue is that we all tend to exhibit time preference. If offered £100 now or £100 in a year's time, most would opt for £100 now i.e. they

prefer benefits now to benefits in the future. If offered the choice of paying a debt now or paying it off in the future, most would prefer to delay payment and pay in the future. When carrying out economic evaluation what choice of discount rates` should be used for costs and benefits? Should the rates be the same for costs and benefits? Currently the English NICE uses different discount rates for cost and benefits: six per cent for costs and one and a half per cent for benefits. Further discussion of these contentious issues can be found in textbooks.<sup>12,13</sup>

The combined effects of poor evaluation of the effectiveness and the reluctance of public health practitioners to incorporate economic evaluation into their work has created a paucity of evidence to inform investment in public health. As ever, and in medicine, the volume of literature is substantial and growing but sadly its quality is poor. This problem is epitomised by the work of NICE which although charged with the task of evaluating public health policies is finding it difficult to make progress due to the poor quality of effectiveness and economic data being reported in the literature.

### Public health and economics: the need for marriage

The topic of public health is not making sufficient impact on resource allocation in all health care systems. The important issues it raises, as epitomised by the analysis of health inequalities, tend to create considerable public interest but little impact on the use of resources. This is a product of both the failure of the public health industry to conduct and report well designed trails of the effectiveness

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of the policies they espouse and their failure to include cost components in their studies. The absence of cost data and the absence of economic evaluation make prioritisation of competing investments impossible. In the absence of economic data resources are` allocated on the basis of rhetoric and political opportunism. This ensures waste with patients and populations being deprived of health benefits they value.

Such inefficiency is unethical. Its mitigation requires that the practitioners of the arts and science of public health embraces the techniques of economic evaluation urgently and comprehensively. Such a marriage is surely made in heaven and would benefit all societies!

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