

Limits of Modern Epidemiological Models

What are the Alternatives?

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Modern epidemiology has, by and large, been based on a narrow model of biomedicine and behaviour modification. It fails to answer, for instance the following questions: Why certain populations are inflicted with certain kinds of disease, and why the access to its cure and prevention is so skewed. The model of social capital that emerged subsequently too fails to address these issues adequately and furthermore suggests that it is possible for a community to escape disease solely through its own initiative. A most recent development that holds a different promise is in the realm of the theory of social capital that is being hailed in influential public health circles as a resurgence of holism. The most significant contribution of this model is that it provides a sociological explanation for health inequalities.

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Modern epidemiology is oriented to explaining and quantifying the bobbing of corks on the surface of waters, while largely disregarding the stronger undercurrents that determine where, on average, the cluster of corks ends up along the shoreline of risk. -- A. J. McMichael, 1994.

It is a widely accepted fact that the 20th century has witnessed unprecedented improvements in the aggregate health status of populations. The average life expectancy in several nations doubled. People are living longer today than any point of time in history. For example, in India, the life expectation at birth increased from 22 years at the start of the 20th century, to 62 years at the turn of the century, and infant mortality rates declined from 200 to about 62 (per 1000) in the same period. In the developed world, the 'epidemiologic transition', that reduced the load of infectious and communicable disease in the population, was partly a result of the allocation of a sizable proportion of budgetary resources to the health sector. Social modernisation, infrastructural investment, environmental improvements, safer water and food and medical interventions contributed significantly to broader health gains. Thus, in England, the US and other developed countries, diseases like malaria, tuberculosis, cholera, etc. became virtually extinct. Even developing nations were placing a great deal of emphasis on better health services. For instance, India, after liberating herself from the colonial yoke in 1947, followed a mixed economy model in which state investments were channelled to the social sectors in general, and health in particular. Thus, all over the globe, the period spanning from the latter part of the nineteenth century to the middle of the twentieth century marked the golden age of public health.

This period was also marked by a progression from a population-based approach towards a laboratory based biomedical discipline. Indeed, the improvement in health status achieved by various nations was primarily attributed to the advances in biomedicine. However, many people, including public health practitioners, questioned this assumption on the ground that that increases in life expectancy and declines in mortality rates in this period were as much a consequence of reduced exposure to infection, improved nutrition and better standards of living as biomedical advances. Despite this, the dominant stream of public health chose not to consider food security and better housing, working and living conditions, water supply and sanitation as determinants of better health. Instead, it overemphasized the role of biomedicine and the impact of modern

transitions in epidemiology in the form of risk factor, clinical and molecular epidemiology. This implied that the dominant understanding of public health research and a vision of its future growth remained confined to the reductionist model of medicine, to the exclusion of the population perspective.

Complacency with this state of affairs, however, received a rude shock with the publication of the Black Report in the United Kingdom in 1980. Disaggregating national level data, the report revealed that in spite of enhancement of aggregate health status, the disparity in health between different groups in the same country had risen over time. For instance, in England and Wales, the difference in male life expectancy between the highest and lowest socioeconomic class recorded an increase from 5.5 years in the mid-1970s to 9.5 years in the mid-1990s. At the same time, it was also evident that disparities between countries were increasing sharply. This indicated a widening gap in the standard of health within and between nations. Furthermore, the latter part of the twentieth century witnessed the emergence of infectious diseases like AIDS and the resurgence of diseases like tuberculosis and malaria, especially among impoverished people and impoverished nations. These evidences certainly shook the unwavering faith in biomedicine and brought to the fore some embarrassing questions for the entire public health community. The fact that widespread disease continued to inflict vast sections of the population despite great advancements in biomedicine compelled some public health professionals to seek answers beyond the reductionist model and thereby led to a deliberation once again on the population perspective.

There is an increasing recognition today that health inequalities reflect the underlying phenomena of social injustice such as poor access to health care, inadequate food, impure water, unsafe living and working conditions and extreme poverty. In the words of Garrett (2000), “If the passage of time finds ever widening health gaps, disappearing middle classes, international financial lawlessness, and still rising individualism, the essential elements of public health will be imperilled, perhaps nonexistent, all over the world”. However, the fact that regardless of such insights, dominant public health policy continues to this day, to remain myopic in its analysis of cause and cure of disease in populations, owes its origin to the philosophical paradigm from which it germinated.

The conception of public health and its basic science i.e., epidemiology, has been profoundly influenced by the philosophy of individualism. According to this world-view, a society is an agglomeration of individuals, and each individual is a free rational agent exercising his profit maximising or utility maximising choice in the free market. Thus, this perspective uproots the individual from his socio-economic context, renders discussions about the issues of unfreedom and constraints against choice meaningless, and makes him responsible for the quality of life he enjoys. In economics, this led to the predominance of the neoclassical school and in psychology, to the predominance of behaviourism. In the sphere of public health, this resulted in a progression along the lines of risk factor epidemiology, clinical epidemiology, and finally, molecular epidemiology. This is not to belittle the developments in biomedicine that have undoubtedly led to the discovery of several life saving drugs and vaccines. The problem is that alongside these developments, there has been a relegation to the background of the most vital aspect of public health analysis viz., the population perspective. It has given rise to a myopic vision that the source of disease and ill-health lies primarily within the individual, in his genes and molecules, or in the form of bacteria that resides within his body. It has also impressed upon the individual's mind that the solution is locked within the drugs and pills available in the market at a certain price or in some form of behaviour modification. Such a prescription serves two purposes. First, it takes away from the collective, the power of effective intervention, and second,

it gives rise to a booming industry of drugs and medicines. It helps to breed and sustain the attitude that problems are to be solved by some sort of ‘technological fix’ or by alterations in individual behaviour rather than by broader systemic changes in the socio-political and economic fabric. The focus on scientific ‘expertise’ and individual genius is overemphasized, and historical and social contexts downplayed. Scientific ideas are used directly to justify the status quo or to demonstrate its inevitability.

This attitude of inevitability, in fact, is all pervasive not only in the field of health but also other social sciences, for example, economics. Neo-classical economics with its market fetishism has advanced a theory of structural adjustment that is deemed inevitable for development. Although the developed nations, in the past and also in the present, continue to spend a significant proportion of their resources on social overhead capital, the structural reforms package advocated for the developing world by the World Bank and International Monetary Fund, advocates cuts in state expenditure which impinge upon the meagre funds for the social sectors. Thus, rising food prices, lack of infrastructural facilities, sanitation, water works and widespread unemployment, along with fund cuts in the health sector have led to increasing ill health among the poor and the disintegration of the already fragmented health systems in the third world. For example, India has one of the most privatised health systems in the world, where Government expenditure on health care systems is even below that of Ethiopia. The table illustrates the situation.

Table: Public Sector Expenditure as Percent of Total Health Expenditure (Selected Countries)

COUNTRY	PERCENTAGE	COUNTRY	PERCENTAGE
United States	44	United Kingdom	96
Spain	70	Norway	82
Japan	80	Germany	78
France	76	Canada	72
Australia	72	Vietnam	20
Pakistan	23	Nigeria	28
Myanmar	16	India	16
Georgia	13	Ethiopia	36
Cote Ivoire	38	Cameroon	20
Cambodia	14	Burkina Faso	31

Source: World Health Organization, 2000

The critical fallout of this narrow biological and individualist model of medicine is the promotion of ‘victim blaming’. It becomes the prerogative of the individual, irrespective of his socio-economic location, to secure his health through the purchase of pills and vaccines or through changes in his behaviour. Some simple everyday examples

illustrate the above case. The sprouting of health clubs, the emphasis on meditation and spiritual enhancement to deal with stress, the campaign against smoking and alcoholism as major hindrances to personal health, are all part of the process of individuation of a larger problem. The policy with regard to AIDS is another instance of the same preoccupation with biomedicine and behaviour modification. Instead of considering AIDS as a resultant of a particular mode of development and addressing the historical and socio-economic causes of the formation of high risk groups (like sex workers and immigrant labour), and high risk regions (like sub-Saharan Africa), the prevalent public health practice is to suggest behaviour modification together with accelerated research in curative medicines and preventive vaccines. Indeed, the striking fact that in sub-Saharan Africa, HIV infection is most rampant in places like mines, plantations and urban squatter camps where the wealth of the globalised economy meets extreme poverty seems to go unnoticed by the dominant public health paradigm. Moreover, it has been estimated that infant and child deaths due to the 'debt war' in sub-Saharan Africa far exceeds that caused by AIDS. Yet AIDS receives a much greater share of the limelight (as well as resources) since it can be explained and tackled by the present model of public health, without raising uncomfortable questions regarding larger socio economic policies. This certainly indicates a large lacuna in public health research.

After the publication of the Black Report [Department of Health and Social Security, 1980], there was a proliferation of literature on the association between economic categories and mortality. While most of these restricted themselves to the descriptive level and did not have any major implications at the policy level, there was nevertheless an increasing recognition that health inequalities are unacceptable and that some steps should be taken to redress the problem. The most recent development in this direction is the theory of social capital. In fact, the model of social capital by Wilkinson (1992, 1996, 1999) has received a lot of attention and is being hailed in influential public health circles as a resurgence of holism. The most significant contribution of this model is that it provides a sociological explanation for health inequalities. However, it falls short of a truly holistic approach due to its lack of an explanatory framework for the development of income inequalities and the emphasis on better social cohesion as the ultimate solution for the attainment of better health status. Social cohesion in the sense of empowering a community to care for its own economic, social and physical needs excludes from its purview the historical location of that community and the need for structural reforms in the economic and social base of that community. Thus, Wilkinson's theory of social cohesion, which is strongly reminiscent of Durkheim's (1953) 'moral individualism', takes the health debate through a full cycle and comes back to the individual. The difference with earlier versions of individualism is that the responsibility is placed not on the individual but the community. The structural factors (social, economic and cultural) which have created and continue to create certain kinds of disease specific to that community and the policy measures required to be undertaken by the state or a larger body to rectify the maladies in the structure, continue to be bypassed. Therefore, this model should certainly not be mistaken as a resurgence of the population perspective. Unlike in the case of population-based epidemiology, it first of all, identifies lack of social cohesion and not of supportive environmental or socio economic structures, as the cause of disease, and secondly, it shifts the onus for change s on the community and not on the state. Thus, the model can at best be regarded as a neo-Durkheimian version of individualism.

The above discussion focussed on the fact that modern epidemiology has by and large been based on a narrow model of biomedicine and behaviour modification. Such a model, especially after the discovery of molecular medicine has led to path breaking discoveries in many life saving techniques and drugs. Despite these, large sections of the population continue to reel under the impact of disease, for many of which, neither cure nor prevention is available. This raises two important issues: Why certain populations are inflicted with certain kinds of disease, and why the access to its cure and prevention is so skewed. These issues unfortunately do not find a place in the mainstream dominant discourse on public health. The model of social capital that emerged subsequent to the publication of the Black Report, too fails to address these issues adequately and furthermore suggests that it is possible for a community to escape disease solely through its own initiative.

The influence of the philosophy of methodological individualism in social sciences has effectively replaced the holistic vision of the individual as a part of a collective by the individualist vision of the collective as a simple aggregation of individuals. In the sphere of public health, it has led to the undermining of the population perspective and the domination of bio-molecular medicine together with the retrogression of the state from the health sector. Empirical evidence suggests that this has given rise to extreme health inequalities, which foster certain dysfunctional factors, such as social exclusion and the resurgence of infectious diseases. An alternative vision of public health, which by its definition, is committed to the betterment of the health of populations, must incorporate the effects of economic and social inequalities into its frame of analysis. In modern times, when the third world is passing through structural reforms, the issues of food security and active state participation in the provision of the basic conditions of health become particularly important. It has to be borne in mind that unlike the first world, the third world is yet to experience an epidemiological transition. Thus, a major overhauling in the health status of large multitudes cannot be considered in isolation from the issue of restructuring and reform of the existing socio-economic order. Public health cannot be considered as a technological fix, a package of benefits with a price tag attached, or a variable dependent upon individual or community behaviour. It involves a political question whose resolution would imply an endogenous restructuring of political, social and economic forces from below.

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