Economic and social determinants of disease
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Blessed, or burdened, with a traditional medical education, doctors are taught that the individual patient has priority. The ethical and just action is that which benefits the individual patient. What is, undoubtedly, a blessing for patients may be a burden for public health. Expanding the clinical role to embrace prevention commonly means focusing on the individual. This may include advice to pregnant women and young mothers, detection of risk factors, and counselling on behaviour change in middle age, or detection of early disease and decrements in functioning at older ages. These are all orientated to the detection and modification of individual risks.

The companion research strategy is the detection of individual risks — the understanding of what factors predict why one individual’s risk of a particular disease should be greater than another’s. The conceptual link with the individual focus of clinical medicine is seamless. The shift in focus is to prevention rather than treatment alone, but the focus on modifying individual risks is the same. Other disciplines, relevant to health, also have a primary focus on individual differences: genetics, psychology, microeconomics. How could a focus on the individual be misplaced? It is after all the individual who must be exposed to the environment, have a set of genetically determined susceptibilities, undergo pathological changes, sicken and, in the end, recover, continue with the condition, or die.

Those of us, from our various disciplines, trained in this way may lift our eyes from the individual in front of us, to observe that there are patterns of disease in the population; some countries or parts of countries have higher rates of disease than others; there are social, ethnic and gender differences in rates of disease occurrence. Might this not lead to evidence that factors outside the individual, in the environment, are related to risk?

Armed with an individual difference approach to disease one might argue that a population characterized by a high rate of disease must have a high prevalence of high-risk individuals; and conversely for a low-risk population. Someone arguing the environmental case might cite the high rate of childhood illness in an area without a clean water supply as evidence against this individual focus. Such loose thinking would not convince the scientist with the individual focus who could point out that infected water would not be a cause of illness if individuals did not drink it or make up milk formula for infants with it. Further, there are surely individual differences in genetic susceptibility that determine why one exposed individual is more likely to succumb than another.

Into this longstanding debate came Geoffrey Rose (1). His argument was at once profoundly simple and simply profound. His thesis is that the causes of incidence rates may be different from the causes of individual cases within a population. This flows from the fact that the determinants of individual differences of characteristics within a population may be different from the determinants of differences between populations. There are important implications both for understanding causes and for strategies of prevention and public health.

At first glance the argument may be taken as a challenge to the fundamental notion that, in the end, it is the individual who must be exposed, sicken and die. It is not of course. For convenience, let us consider two levels of argument. At the simplest level, Rose’s argument has to do only with range of exposures. In the population where every individual has smoked the same number of pack years of cigarettes, smoking would not be identified as a cause of lung cancer. Indeed, it would have no role in determining why one individual succumbed to lung cancer and another did not. To detect a relation between smoking and lung cancer one might compare this smoking population with another with low rates of smoking. Traditionally, such comparisons are treated with suspicion as subject to the ecological fallacy. It may not be the smokers in the
population that get lung cancer. Unless we could find a population in which there was variation of exposure to tobacco, such ecological analyses would be the main strategy open to us. We would probably accept it with reluctance as what we really wanted to know was whether an individual's smoking history was related to the individual's risk of lung cancer. This would come from a study of individual risks.

What if we were dealing with unclean water? Would the best study be one of individual risks? Not necessarily. If villages with clean water had a lower rate of childhood illness than villages without, would we argue that the best study was one of why one individual within a village became ill and another did not? This might provide very useful complementary information if, for example, children in families that boiled their water had lower rates of illness. But the main question might still be why one village had a higher rate of illness than another, and what could be done about it.

So far, so simple and relatively uncontroversial. The choice of studying differences within populations or differences between populations relates mainly to the range of exposures. But there is another level to the argument. These different questions may have quite different policy implications. The implications of the studies of between-individual differences might be advice about boiling water. The implication of the between-village differences may be engineering to provide a clean water supply. Rose lays out clearly the implications of his understanding for two different policy arguments. These different questions may have quite different policy implications.

This leads on to the problem of how we deal with risks that are socially and politically determined. The individual level of analysis may be appropriate for understanding how individuals may be affected but may miss the operation of social causes. Amartya Sen has argued that famines do not occur in countries with well functioning democracies (2). How would a study of why one starving child in a refugee camp died more slowly than another help with this insight? How would it be relevant to policy? It would not help and would not be relevant. The relevant level of analysis is social even though the outcomes are disease and death.

Political economy and individual differences in susceptibility span the range of Rose’s distinction between the causes of cases and the causes of incidence rates. In between these extremes, this distinction has far-reaching implications. Regrettably, they are not widely remembered. Let us examine a further example from the field of inequalities in health.

In Britain, by tradition, the term health inequalities means differences between social groups (2, 3). An economist put it to me that the social gradient in health (4) explained only a small part of total inequalities in health. The first problem was linguistic. As an economist he used the term inequality to apply to the total variance in health in the population. His conclusion was that the social group to which an individual belonged made a small contribution to the total individual variation in health. He is, of course, correct. But that conclusion applies to most explanations of individual differences in health. From the first Whitehall study of British Civil Servants, we calculated that only 7% of the individual level variance in lung cancer mortality could be explained by age, smoking and employment level (5). Another way of saying that smoking accounts for little of the individual differences in the occurrence of lung cancer, is to observe that most smokers do not die of lung cancer. Yet, the group differences are dramatic: 95% of lung cancer deaths in this cohort occurred in smokers.

Similar conclusions apply to the question of social inequalities in health. The determinants of individual differences in risk may be different from the determinants of differences between social groups. This accounts for reluctance (6–8) to apply the term inequality, as economists do, to individual differences in health (9).

Rose developed the ideas in this classic paper into his brilliantly clear book, Strategy of preventive medicine (10). His conclusion was: “The primary determinants of disease are mainly economic and social, and therefore its remedies must also be economic and social”.

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References