

This section looks back to some ground-breaking contributions to public health, reproducing them in their original form and adding a commentary on their significance from a modern-day perspective. John C. Caldwell reviews the 1971 paper by Abdel Omran on the epidemiological transition. Extracts from the original paper are reproduced, by permission, from *The Milbank Memorial Fund Quarterly*.

Population health in transition

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Until recent times most deaths were caused by infectious diseases, degenerative diseases, or violence. Let us ignore violent deaths, as they can occur at any age. Infectious diseases are a threat from the day of birth and, indeed, the very young are most susceptible to their attack. People die of degenerative diseases at older ages because it usually takes time for the body to degenerate and there is little else to die from, though they must eventually die of something. What happened in the mortality transition was the conquest of infectious disease, not a mysterious displacement of infection by degeneration as the cause of death. The resulting demographic transition with its changing age of death and the existence of large numbers of people afflicted with chronic degenerative disease (rather than life-threatening infectious disease) is important for planning health services and medical training, which is the current focus of the burden of disease approach.

Why did Abdel Omran's essay (1) have such an impact on the public health community, an impact with echoes of Malthus's views on population? There are certain similarities to *The First Essay* of Malthus in 1798: Omran firmly stated a number of propositions, which were only sparingly spelled out and buttressed by limited references. Also, he republished the paper several times although, unlike Malthus, his additions were largely limited to applying the thesis to the United States and suggesting a fourth stage (2). Omran postulated the displacement of pandemics by "degenerative and man-made diseases" without explaining what was meant by the latter, but in 1982 he specified that it included "radiation injury, mental illness, drug dependency, traffic accidents, occupational hazards" (2).

The public health community was undoubtedly attracted by the prospect of combating man-made diseases: what human activity could create, human activity could correct. The other attraction was the suggestion that somehow degenerative and man-

made diseases had replaced infectious ones, which presented a picture of combat between warring camps of disease into which the health professionals could throw themselves. Omran did in places relate this replacement to mortality decline and changing age structures, though he touched upon age structure only very lightly and usually treated a population as an undifferentiated unit. This approach was central in giving the paper such force.

Omran added strength to his argument by segmenting the epidemiological transition into periods with different mortality patterns and disease levels. Thomas McKeown also did this, though only his first two historical papers (3, 4) were published before Omran's.

The other form of segmentation Omran used was numbered propositions, to which we now turn. Proposition One, "that mortality is a fundamental factor in population dynamics", has always been agreed: in all demographic transition theories it is the prior decline in mortality that in due course precipitates the fertility decline. It is true that for decades after the Second World War demographers gave more attention to the causes and nature of the fertility decline than to those of the mortality decline, though they stressed that such attention was necessary because of the preceding unforeseen steep mortality decline in developing countries. The importance of Omran's and McKeown's work is that they drew attention to this imbalance.

The core of Proposition Two, "During the transition, a long-term shift occurs in mortality and disease patterns" is clear, but the subsequent excursion into the determinants of the transition is subject to the same criticisms as have been levelled at McKeown's work. The ascription of the 19th-century Western mortality decline primarily to ecobiological and socioeconomic factors (McKeown said nutrition), the argument that "the influence of medical factors was largely inadvertent", and the implication that the struggle against infectious disease was unimportant after the turn of the century, are all contestable. These conclusions were largely drawn from the mortality statistics of Sweden and England and Wales. The problem with relegating the 20th century to unim-

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portance is that it accounts for 66% of the total mortality decline between 1800 and 1971 in England and Wales and 54% in Sweden, much of which can probably be attributed to the reduction in infectious diseases. There are also difficulties about 19th-century chronology. In both countries mortality fell quite rapidly between 1800 and 1840, more slowly between 1840 and 1870 (in England hardly at all), and fastest in the last three decades of the century. The improvement between 1800 and 1840 may have been partly propelled by improvements in personal hygiene. Of the ensuing mortality decline from 1840 to the end of the century, 86% in England and Wales and 67% in Sweden occurred after 1870. This was the period when advances were made in the treatment of water, the provision of sanitary services, the removal of waste, and the enforcement of laws against overcrowding. Antiseptics began to be used and, towards the end of the century, pasteurization, especially in the form of the home boiling of milk for babies. Doctors may have had only limited curative powers but they appear to have given leadership in improving hygiene, midwifery training and child care. On the other hand there is little evidence that nutrition improved (2). Even the limited 18th-century mortality decline can probably be at least partly explained by more effective government action to reduce famine mortality peaks (5), and perhaps also — employing findings from the contemporary Third World — by the growth of the market and transport networks (6).

Proposition Three is that “During the epidemiologic transition the most profound changes in health and disease patterns obtain among children and young women”. Certainly mortality rates fell fastest for most of the transition among children (7). It is not clear why Omran placed an equal stress on women, though in many countries female mortality falls in the reproductive ages as fertility declines, and men in the West damaged their health to a greater extent than women during the cigarette smoking “epidemic” that began with the First World War.

Proposition Four is that “The shifts in health and disease patterns that characterize the epidemiologic transition are closely associated with the demographic and socioeconomic transition that constitute the modernization complex”. It is plausible to argue that these shifts are the mortality side of the

demographic transition. They are all, of course, the result of global economic growth and modernization. But expressing the change as being essentially socio-economic subtly downgrades the specific contributions made by public health interventions and especially by breakthroughs in medical science. This suspicion receives powerful support from the extraordinary pot-pourri that constitutes Table 4, where everything that has happened to Western society is thrown together as if all of it had causal relationships. This table and the accompanying account of consumption output ratios break the lucidity of the developing argument and do little to enhance it.

Proposition Five, with its three basic models of the epidemiological transition, fails to grasp the global nature and the historical sequence of the mortality transition as it spread. In truth, there are probably as many models as there are societies. It underestimates the flow around the world of ideas, behavioural models, education systems, public health approaches and medical technologies. Both Omran and others were tempted to add further stages, particularly a stage associated with the reduction of age-specific death rates of degenerative diseases and the accompanying increase in life expectancy at older ages (2, 8).

Omran’s essay, together with the work of McKeown, makes the case for a greater concentration on the mortality side of demographic transition. It saw health change as part of social change, and led public health practitioners to regard their activities as of central importance. On the other hand, Omran seemed to argue that the change in the causes of death was a determinant rather than a consequence. His theory could be attacked as being insufficiently epidemiological in that its focus was the changing causes of death rather than the changing causes of patterns of illness. It seems so determined to emphasize the role of social change and, to some extent, ecobiological and environmental change, that it goes out of its way to understate the contributions of scientific inquiry and medical technology, in spite of their also being products of the modernization process. Few concessions are made to the roles of laboratory experimentation in showing how water can be purified, sewage made safer, and immunization programmes rendered possible; of doctors in giving leadership in the 19th century; or of curative medicine at any time. Its greatest value was to stimulate inquiry. ■

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