

Sustainable urban development — the public health dimension

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Abstract—Public health in England developed during the first half of the nineteenth century with concern for sanitation in urban areas. Since that time environment, behaviour, social relationships, health services and genetic constitution are all recognized to contribute to health and disease in populations. Sustainable development is now of global concern, and its foundations—economy, environment and society—are similar to the determinants of health. However, while improved environment will have an important contribution to health, the broader social objectives are also needed to avoid the downward cycle of inequality and cultural deterioration that has occurred in some western cities. Epidemiological studies at University College London are particularly concerned with these social dimensions, and research opportunities exist for collaboration with environmental sciences in a number of areas, including intersectoral work, societies in social transition, collaboration with business, and research within through the European Union.

Keywords: environment, health, policy, sustainable-development, urban.

1 Sustainable urban development—the public health dimension

Towns and cities are currently the focus for economic planning and development in European countries. Formerly, politicians and planners prioritized international and national levels, with macro-economic development seen as the basis for prosperity. But in the post-industrial phase of western economies, there has been a change from manufacturing towards services, and from a predominantly male manual workforce towards higher-skilled mixed-sex workforce. Cities now compete as economic units, and the maintenance of city and regional economies is critical to the development of national and international economies.

In Europe around 80% of the population live in towns and cities of 100000 population or more. Yet until recently, these urban areas were seen in some way as a “drain” on the economy because of the needs of the dependent population—children, increasing numbers of retired people, people unemployed and marginalised. Moreover, city industrialization has created social “problems”—social fragmentation and alienation, isolation, crime, drug abuse—that offset the economic benefits of development. Elsewhere in the world there is also a continuing move from the countryside to towns and cities, stretching local economies and needing infrastructure investments—housing, sanitation, education, employment. What are the effects of these changes? After the physical structures have been made, will the social structures encourage productive and fulfilling lives, or the crime, poverty, debt and corruption, crime now seen in some inner urban areas?

Sustainable economic development must be joined with concern for good environmental and social outcomes. Public health, achieving and sustaining the health of the population, makes an important contribution to economic development in enhancing the potential of all sectors of the urban population—building the “social capital” of the future. Public health in its broadest sense is both a product of, and a contribution to, economic development.

2 Historical perspective

Public health—concern for the health of the population—in nineteenth century England developed from a specific environmental perspective—the provision of sewers by local governments which, with water supplies directly into houses, provided effective removal of human waste. The 1848 Public Health Act gave local governments the power to raise the capital necessary for the substantial investments that sewerage required. The act was steered through Parliament by Edwin Chadwick,

a lawyer, public administrator and benefactor of University College London, who saw sanitation as the solution to controlling the “fevers” that were the major cause of death and disease in the rapidly growing towns and cities on England (Hamlin, 1998). UCL created its first Chair of Hygiene and Public Health in 1869 (Harre, 1978).

The Public Health Act also stated that local governments could appoint a medical officer to give medical advice on actions to improve the local population's health. These Medical Officers of Health led “environmental health” departments acting within laws for a wide range of responsibilities—control of abattoirs, cemeteries, solid refuse disposal, and other sources of potential infection. But by the end of the nineteenth century, medical laboratory science identified some of the micro-organisms responsible for infectious diseases. This new focus on the agent, rather than environment, led to the development of chemical, and later biological, substances to kill bacteria.

At the same time, other science-based treatments have increased the effectiveness of hospital medicine. As well as their environmental health role, local governments developed public hospitals (including institutions for mental illness) and welfare clinics for mothers and children. In the United Kingdom, the public and private hospitals, and the local services provided by general practitioners, were brought together into a single National Health Service in 1948, and in 1974 the local government clinic health services were also included. Environmental services remained with local government. In some other European countries, however, hospitals and medical specialists remained in private practice, and the translation of “public health” implies provision of health services by public agencies rather than the broader meaning used in Britain (McCarthy, 1992).

The current focus of scientific medical research and industrial investment is “mapping the human genome” —defining the biochemical structure of genes in human cells. The objective is to understand how genes direct development of the human body. Physicians still see individual patients with symptoms which they interpret as disease processes, but the interpretation of the “causes” is increasingly made at cellular and sub-cellular levels. Nevertheless, chronic diseases such as cancer, arthritis or dementia are a result of complex interactions between individual (genetic) characteristics and environmental exposures over a lifetime. It remains logical to identify, and to remove, these environmental exposures even when the biological basis of disease is understood.

3 Cities, environments and health

Because public health research and practice in the twenty-first century will be linked to sustainable development, it must centrally take account of urbanization. But urban development in England is not a model for the future. In nineteenth century towns and cities, industry developed with little regard for the needs of the working population or the pollution that was created. Poverty created slums and disease, and housing was built with gross variations in standards between rich and poor. Urban sanitation was prioritized as a means of controlling disease, while other causes, including poverty and hunger, or the effects of cold, damp and poor ventilation, were given less concern. During the twentieth century there have been successive attempts, for example through public housing, to improve cities. Yet, while some indices show considerable improvement, for example over-occupancy or central heating, the geographical inequalities created two hundred years ago still exist. And while economic development has continued, social indices are deteriorating. Crime has been rising, alcoholism is more prevalent, drug use is now widespread amongst younger people.

Perhaps the most serious effect of the twentieth century has been advent of motor vehicles. Before the 1930s, English towns and cities used walking, cycling and horse-drawn transport locally, and railways for longer journeys. The new suburbs have been built for cars and, with inter-city motorways, there has been a rapid expansion of motor car use, but the impact on public health

has not been beneficial similar levels of car use for everyone in the world are likely to be unsustainable (for energy use). Urgent attention is needed to develop urban transport policies that are health promoting and environmentally sustainable.

4 Public health and sustainable development

Five broad factors interacting to sustain or reduce personal health are: (1) socio-economic environment; (2) physical environment; (3) behaviour; (4) health care; (5) genetic constitution.

These are not separate from each other; combinations exist. Economic poverty is often found with a poor physical environment, and limited knowledge of health-promoting behaviour. Health services may engage in health promotion directly, while-in some medical systems-poor people receive less health care. Where in the causal chains should public health focus research, and where should it act (World Health Organisation, 1998)?

Added to these considerations now is concern for the earth's continuation as a hospitable environment to maintain human life. The idea of "sustainable development" arose from the 1988 Brundtland Commission report and the succeeding 1992 United Nations "Earth Summit" in Rio de Janeiro (Sum, 1998). Economic development for people across the world will require major and long-lasting changes from current economic behaviour. Among themes have emerged are: rationing the use of non-renewable resources; ensuring that pollution does not damage human health; ensuring development does not destroy ecosystems; and limiting use of energy to prevent global warming.

It has also become evident that equity must be a key concern for policy-making. If resources are limited, their distribution is crucial. At the international level, this is not only a question of ensuring that people in the "south" have sufficient resources to overcome poverty, it also implies major changes in ways of living for some people in the north. Use of energy is a good example since it appears that, if the current energy use of the richest were available to everyone else, then global warming would increase rapidly. At a local level the argument is rather different, and based more on moral grounds: some inequalities are both unjust and inefficient within a society, and it is the objective of some democratic policies to overcome them.

Debate on sustainable development has mainly been concerned with protection of the environment. But the clear objective of the Earth Summit's "Agenda 21" is to develop economic policies with both environmental and social criteria: our concern for an environmentally balanced world is for humans to live in it. And therefore social objectives—including health and welfare—need to be given as much attention as environmental ones. Some of the debate in public health today in relation to urban planning is to understand the "social dimension" as an output result of economic activity and also as an input in the aetiology of health.

Public health is the area of medicine most closely associated with urban environmental concerns. Epidemiological methods have been used to demonstrate the contribution of specific exposures to the development of disease. Environmental technologies may be of benefit in improving sustainability, and can also contribute to reducing pollution. The challenge for the twenty-first century is how to create cities that achieve full social and health potential for citizens. This is not just a matter of good housing and employment. Cities must achieve a range of amenities for all citizens, social relationships that create positive social trends (strengthened family links, less crime, less addictive behaviours, balanced nutrition, sufficient exercise and so on). These social and behavioural characteristics of individual citizens are—to a considerable extent—determined by the economic, social and physical construction of towns. And the results of research have important political impacts—indicating rational choices between different local policies for public and private

investments.

5 Public health research

In recent years, public health medicine has drawn on the science of epidemiology to describe individual exposures and “risk factors” for non-infectious diseases. The classic example has been proof that cigarette smoking causes lung cancer, but epidemiology has been applied to many other diseases including heart disease, respiratory diseases, accidents, and even mental illness. Public health action has been directed at prevention through health education for groups and individuals, and changing public policy.

But, just as (and perhaps because) the genetic basis for human disease is complex, so also the factors contributing to disease are many and varied. It is rare to find a single factor so directly related to a disease as smoking is to lung cancer (cigarette smoking directly causes 90% of lung cancers; yet even so, only one in two people who smoke heavily throughout their lives die from a smoking-related disease, and only one in five die of lung cancer). Public health research seeks to identify the various factors that contribute to disease, and the different opportunities for intervention, but the contributions may interact and affect individuals differently. Moreover public health research, in comparison with the laboratory, is rarely able to make formal experiments—certainly not any that might cause disease. Showing which environmental factors are the key ones, and whether they are additive or multiplicative, is a significant challenge to epidemiology. Thus, typically, the evidence is partial and open to different interpretations and emphases.

Public health research at UCL draws on both classical epidemiological models and interdisciplinary approaches:

- The Whitehall study is a large prospective survey of English civil servants (Marmot, 1996). It was first developed to explore behavioural factors in heart disease, but the “grades” of civil servants, from manual staff up to the highest executives, provides a natural opportunity to explore socio-economic differences in non-industrial work settings.

- The Medical Research Council National Survey of Health and Development is a large prospective study of people, originally born in 1946 (Wadsworth, 1997) and seeking to understand the links between early life experiences, social position (e.g. parent’s occupation), individual risk factors (e.g. blood pressure), and health outcomes (e.g. disease episodes and causes of death).

- The Health Behaviour Unit undertakes studies in individual and group control of health-related behaviours, especially obesity (Wardle, 1995) and smoking (Jarvis, 1996).

- The International Centre for Health and Society seeks to measure and analyse variation in health and disease between countries, including Central Europe, Russia and Japan, looking at social, economic and cultural causes.

As with other departments of UCL Medical School, public health medical staff undertake practice through joint appointments with National Health Service. A local public health report, written annually by the National Health Service Department of Public Health, describes trends in the health status of the local population, identifies the health problems of the population that persist despite existing policies in both environmental and health services—and calls attention to population sub-groups with special needs (Camden, 1997). The report is a resource for local decision-making, improving the population’s health and social capital, and thus strengthening the economy—a contribution to sustainable development.

6 Opportunities

Four areas of opportunity for linking health and environmental research can be proposed:

- Intersectoral work. Success in aetiological epidemiology has been achieved through focusing on specific problems and using quasi-experimental techniques. However, many of the current urban

problems do not yield only to reductive approaches, and need broader, multi-disciplinary teams. UCL has expertise over a wide range of socio-environmental subjects, including spatial planning, engineering, architecture, social studies, and population medicine, which can be combined to investigate urban problems in new ways.

- **Social transition.** In the 1990s there have been major changes in patterns of governance and economic development in Eastern Europe and Asia, and in the continued move from rural to urban settings. These “natural experiments” are important sources of information for achieving sustainable development. For example, the impacts of new market relations need to be understood, and how existing social relationships and social capital is affected. In the early 1990s in Eastern Europe, health indices—including mortality—showed a significant deterioration in association with increasing economic uncertainty and increased socio-economic differentials. Which countries are facing these problems successfully, and what are their policies? How do environmental and social changes interact?

- **Commerce.** The economic force of the 1990s has been creating of new commercial organizations, both large and small. Where traditions of democratic governance and “civil society” are weak, commercial organizations have a strong position—especially where government and business power overlap in the same people. Research is needed to describe how environmental and social dimensions of sustainable development are influenced by commerce, and what opportunities there are for gain to both commerce and broader society.

- **European Union.** The Fifth Framework Programme for Research and Development is being unfolded now, and will start in 1999. Both environment and health are priorities. The call for research emphasises inter-disciplinary work and knowledge gained through collaboration across countries. One sub-programme “Cities of Tomorrow”, in particular, is concerned with sustainable urban development.

7 Conclusion

The disciplines of environment, engineering, sociology and medicine overlap in public health. Sustainable urban development will depend on new solutions based on better understanding of causal relationships and the effects of policies in different settings. International collaboration offers considerable rewards for government, commerce, the research community and the public.

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