WHO HEALTHY CITIES PROJECT

Good planets are hard to find

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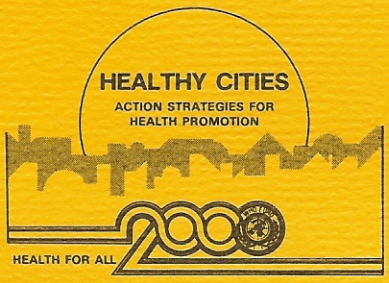

WHO HEALTHY CITIES PAPERS

No. 5

The Concept of an Ecological Public Health

One of the key characteristics of health promotion and the new public health is that it is ecological (Milio, 1987; Martin & McQueen, 1989). The Ottawa Charter for Health Promotion (1986) speaks of a socioecological approach to health, and the Adelaide Recommendations: healthy public policy (1988) propose to link the ecological movement and the movement for a new public health. It is necessary, however, to clarify conceptually an ecological public health, to trace the theoretical roots and development of an ecological paradigm in health, and to consider the long-term consequences of an ecological approach to public health.

The concept of an ecological public health has emerged in the last decade in response to a new range of health issues and problems in developed countries. This change can be described as a shift in risk patterns. There are new global ecological risks (such as destruction of the ozone layer and a wide range of environmental hazards and disasters), that pose a risk to health and health risks are associated with the social, cultural and economic organizations of these societies. These risk patterns tend to be cumulative, have no clear cause and do not allow for simple, straightforward cause-effect interventions. In many cases they tend to be global and finite. Once contracted they can be diagnosed, sometimes alleviated, rarely cured. They generally build up silently and invisibly over time and then emerge as a breakdown in people's bodies and in the social and physical environment. The intervention modes of public health seem ill prepared for this new reality and the risks it poses to the health of populations. This shift has led to a reconsideration of the interdependence between people, their health and their physical and social environments, best illustrated by the mandala of health (Hancock & Perkins, 1985). Building on holistic health approaches developed in the context of the wellness movement, the mandala of health attempts to emphasize the interaction between the mind, body and spirit that constitutes health, but also relates health to the wider concept of an ecosystem that strives for balance. This interaction and interdependence is central to ecological thinking. A new public health approach would therefore not only shift from its present reliance on behavioural epidemiology and surveillance to a more environmental and social approach, but would aim to tackle the risk patterns with an ecological approach.

The Ottawa Charter for Health Promotion, and *Our common future,* the report of the World Commission on Environment and Development

(also called the Brundtland report) (1987) outline a global agenda for change based on a strategy for sustainable development that focuses on health, environment and economy. Together, these documents outline a new public health agenda for the twenty-first century and re-establish the link between public health and social reform. The nature of the challenge of health has changed and the orientation and priorities of public health must therefore change.

C.E.A. Winslow (1923) defined public health as: ... the science and the art of preventing disease, prolonging life and promoting physical (and mental) health and efficiency through organized community efforts for the sanitation of the environment, the control of community infections, and education of the individual in principles of personal hygiene, the organization of medical and nursing service for the early diagnosis and treatment of disease, and the development of the social machinery which will ensure to every individual in the community a standard of living adequate for the maintenance of health.

This definition of public health - and many others - needs to be transcended.

Societal developments

Industrialized societies have changed rapidly since Winslow's time. Much of this change has been caused by scientific and technological advances (including their negative consequences), economic growth, new forms of global interaction and exploitation and new patterns of social organization, political practice and overall lifestyles. This paper does not analyze the interdependence of these factors and how they work together to produce social change, technological progress, economic development or crisis, as there are many ideologies, academic studies and ad hoc interpretations to choose among. The societies on which this paper focuses are called developed (although most of them are in decline) or industrialized (although most of them have moved on to become service societies). The social science definitions range a step further, and include postindustrial or even postmodern societies, describing changes in social organization and value orientation that are usually not part of the debate on growth and development. Even in economics, it is hard to keep up with the new terminology: for example, rapidly developing countries such as Thailand or least developed countries such as Bangladesh.

Most of the definitions of progress, however, are based on gross national product, which is then equated with increased quality of life, and not on such indicators of quality of life as education, health, employment, housing and the quality of the environment. Interestingly, even *Our common future* (World Commission on Environment and Development, 1987) classifies health and education as noneconomic variables, thereby reinfor-

cing a narrow view of social and economic investment and resources. Feminist analysis has long drawn attention to this. A system of economic management and accounting and a system of societal values that defines what (and who) is productive and unproductive which is rooted in nineteenth century Western thought and interpretations of the world, is spreading to all societies (which cannot be as easily differentiated into capitalist or socialist any more).

Whereas in the nineteenth century, economic growth seemed to lead towards a better and richer society and promised a future, people now believe that it is leading to disaster. This nineteenth century mode of thinking (which has different interpretations in different philosophies and ideologies) includes:

- the belief that humankind dominates and is separate from nature and can exploit it to the limit since natural resources are unlimited;
- the equation of productive work and integration in the official labour market;
- the belief that science and technology guarantee progress;
- the belief that most phenomena can be explained in terms of cause and effect;
- the belief that the freedom of the individual is paramount; and
- the belief that human beings can adequately adjust to the changes caused by growth and progress.

This interpretation of the world does not solve the problems facing humanity, especially in view of new global environmental issues and health problems.

Nevertheless, the argument that economic growth by itself produces health and well-being is widespread and is propagated by international agencies and their economic support programme. For example, the International Monetary Fund imposes programmes that sacrifice health to achieve economic growth in countries in financial difficulty. This is aggravated by the belief that improved health technology will ensure better health. To determine the validity of the (often combined) arguments that economic growth improves health and that advances in health technology promote health, it is necessary to look back in history.

The societal response to health risk patterns.

The risks that kill you are not necessarily the risks that anger and frighten you. Risk is the sum of hazard and outrage. (Peter Sandman, Rutgers University).

The infectious diseases of the nineteenth century borne by air, water and food made early death a part of everyday life. Diseases struck silently and

rapidly and could rarely be cured. Nevertheless, between 1850 and the early 1900s, the prevalence of infectious diseases declined rapidly. Some of the best data on changes in mortality and morbidity over the last century are available in the United Kingdom, which was also where one of the key explanations originated for the secular decline in mortality between 1850 and 1914. The McKeown (1976, 1980) thesis states that advances in medical science did not cause this decline in mortality, but an overall increase in wages and living standards specifically improved nutrition, which led to greater host resistance and overall better health. The new discipline of social medicine was founded at that time based on this thesis.

Meanwhile, an abundance of new research (collated by Simon Szreter (1988)) has put the McKeown thesis in perspective. This reassessment has found four key elements that must inform any new public health strategy.

1. Economic growth and increased wages cause an overall change in morbidity and mortality patterns but, by themselves, do not guarantee that the overall health of the population improves. In fact, health differences persist; recent data on inequities in health from the United Kingdom show clearly that, in many cases, inequity has increased. Rapid growth and urbanization can cause previously unknown negative health effects, as happened in industrializing England and is happening in large urban metropolises and in developing countries.

2. Health and well-being are improved through the complex interaction of initiatives in various sectors, such as the improvement of housing and working conditions (including the factory and overcrowding Acts), the introduction of compulsory education, the introduction of systemic public health measures, hygiene education by various organizations (including anti-alcohol campaigns by the labour movement), family planning initiatives, and increasing the social rights of specific population groups such as women, workers and children.

3. These measures, laws and systems are not obtained without a struggle for reform. The official history of public health portrays the public health movement as a succession of deeds of dedicated professionals instead of putting the improved health of the population in the context of political and social struggles. The period covered by McKeown's analysis saw the birth of trade unions and new political parties and the spread of the Communist Manifesto, family planning advocates and suffragettes. The struggle for reform (or for revolution, in some cases) also meant that certain social and economic conditions were not socially acceptable anymore. The social perception of risk had changed, and the political response therefore had to change.

4. Scientific medicine as such contributed little to these secular changes; the technologies that mattered were social intervention and the ingenuity of engineers. This is not intended to belittle the contribution of many public health pioneers trained as doctors who played a key role as medical officers of health. Nevertheless, the public health systems and infrastructures these pioneers so diligently devised (particularly at the local level, with the strong support of local authorities) made most of the difference.

In discussing policy options based on the risk patterns of the 1990s, it must therefore be emphasized that economic growth alone does not guarantee better health (as many laissez-faire adherents would like people to believe); complex systemic measures and legal reform accompanying economic growth are necesary. The health systems introduced a century ago responded to the health challenges and risk patterns of the nineteenth century - many of which still exist, especially in the developing world. These systems were a major tool in introducing a new historical phase: the industrial society. Public health measures were socially perceived to be essential for the growth of industrial society. They symbolized this society's ideological promise of increased welfare for all through the unprecedented growth of the wealth of nations.

The link between social change, pressure for social reform (of many political colours) and public health has been lost. Many of the problems facing the old public health (such as diseases linked to poor living conditions) have been replaced by straightforward surveillance and lifestyle-related diseases attributed to behaviour. Public health has gradually abandoned its holistic approach and moved into a phase of medical dominance, focusing on behavioural epidemiology, preventive medicine and health education. It has individualized cultural patterns by concentrating on disease categories and principles that explain how risk factors cause diseases (for example, heart disease and high blood pressure require reduced fat consumption and other changes in health behaviour). The practice of public health does not yet correspond to the overall changes in risk patterns. Only recently has public health started to incorporate a social model of health which makes healthier choices easier and improves the social climate for health. The future of health depends on the approaches public health systems use in the next 50 years to deal systemically with the issues that confront societies globally.

A new public health agenda

Over the last 150 years, public health has shifted from a holistic approach

(as reflected in the sanitary idea) to approaches that increasingly tend to be based on the individual rather than on organized community effort and on a social mechanism that ensures to every individual a standard of living adequate to maintain health.

The destruction of the link between public health and social reform and an overall vision of society has left public health naked and weak. The public health system in the nineteenth century was one of the most powerful tools to promote the development of industrial society without too great a human loss, but it has lost this leading role in present developments. Public health is neither in the centre of present health systems, which are dominated by medical techniques and cures rather than community-based health efforts, nor is it yet adequately prepared to lead in solving the new health concerns of the community and the global ecological health challenges of the future.

According to its constitution, WHO (1988) is the world's leading public health authority. In the process of its development, however, WHO succumbed to the medicalization of public health. At the end of the 1970's, WHO was in danger of becoming the World Medical Organization, but with great diligence and vision it presented the world with the goal of Health For All by the year 2000 (WHO, 1981) and with a strategy to achieve this goal: primary health care. This was a rediscovery of the two basic principles of public health:

- the need to improve living conditions (providing the prerequisites for health, such as housing, water, income, food and education); and
- the need to build a systemic public health infrastructure, to ensure an organized community effort towards health.

Two further elements were added that are critically important to the new public health: health was considered to be a social goal of government and a global and not just a national challenge. Health has to be achieved on a world-wide scale based on joint global commitments.

The strategy of emphasizing primary health care was far too often interpreted as a way to provide basic medical care, rather than focusing societal effort on implementing systemic measures that promote health and prevent disease. To reinforce the statement that achieving health for all means to ensure to every individual a socially and economically productive life and therefore to ensure a political commitment to health, WHO undertook a further initiative to develop a new understanding of public health. The Ottawa Charter for Health Promotion (1986), which was adopted at the First International Conference on Health Promotion in November, 1986 summarizes these efforts. The Ottawa Charter outlines the conceptu-

al starting points, basic principles and action areas of the new public health.

The Ottawa Charter for Health Promotion (1986) expresses the need for a new view of health; for the first time, a WHO document included a stable ecosystem and sustainable resources as prerequisites for health. It states that: ''Caring, holism and ecology are essential issues in developing strategies for health promotion'', and calls on health professionals and decision-makers ''to recognize health and its maintenance as a major social investment and challenge; and to address the overall ecological issue of our ways of living''.

The Ottawa Charter has helped to redefine health agendas around the world; it is a watershed in the development of health promotion and public health (Green & Raeburn, 1988). It is definitely the first document to outline an agenda for the new public health by placing it firmly in the context of new ecological thinking. This is then the potential impetus that could impel public health to become part of the vanguard of societal development and to provide tools that help develop a more sustainable society.

The similarities in priorities and strategies in the Ottawa Charter and the Brundtland report are striking, but they are not coincidental. Each redefines the issues at stake in terms of human and ecological resources and development, and expresses a moral obligation to other living beings and to future generations. Each advocates that investment in health and the environment be based on new priorities and patterns of policy-making. Each expresses the need for new infrastructures and legal systems.

WHO has recently reinforced this approach in preparing its contribution to the international efforts towards sustainable development. A World Health Assembly resolution (WHO, 1989) stressed that achieving health for all requires the sustainable use of the world's resources and sustainable social and economic development.

From the sewerage principle to an ecological principle

This is the proper agenda for the new public health. Public health needs to rise above petty professional squabbles over specialized fields of intervention to a generalist and policy-based concern for the health of populations, which can no longer be separated from the social mechanisms that produce risks to health. These mechanisms now produce far greater risks to health than could be imagined when nineteenth-century public health systems were established.

A good illustration of these issues is the sewerage principle. Although

the sewerage system was a brilliant, successful and innovative technology in public health, it was a solution adequate to an immediate problem. It was a systemic approach that attempted to cover an entire population rather than special risk groups, but over time it had one crucial drawback: nobody really thought that there could be limits to the supply of water or the capacity of rivers and oceans to cope with all the debris. Nobody had envisaged the sheer amount and toxicity of the debris and the cost of managing it over time. Industry, politicians and citizens think in terms of the sewerage principle. In a simplistic form, this metaphor is as follows:

Regardless of the amount or type of negative side effects produced by economic growth, an invisible hand and a working system is there to receive it and get rid of it. Both citizens and industry flush it down and expect it to disappear. This service is expected to work at minimal cost and with no stench and discomfort. Both governments and nature are expected to have an ever-expanding capacity to ameliorate the side effects of production and economic growth. If something goes wrong, systems (such as medical care) are expected to fix the problem or compensate for the damage done (insurance schemes). The prevention implemented copes with the debris and thus prevents the worst short-term consequences that could arise. Serious prevention is rarely attempted.

Over the last decade, however, the messages warning that the sewerage principle is breaking down have been increasingly heeded. People are finding that they are bathing in their own debris. This is a critical difference between the old and the new public health: there is no away in which to throw things any more. The problems humanity faces have no precedent or analogue in public health history: destruction of the ozone layer, harmful chemicals in groceries, pollution of ground water by pesticides, genetic engineering, large-scale depletion of natural resources and others. These problems have accumulated silently while some people were joking about the warnings of the Club of Rome (Mesarovic & Pestel, 1974) or the concerns of the greens. The world can no longer be conveniently divided into developed and developing any more as these problems are global and threaten even the people that have produced them. Simple causation and compensation principles do not apply any more, and many of the problems and conditions cannot be cured. Science has only limited answers, and it is part of the problem.

In addition to these environmental issues, public health is increasingly being confronted by:

- disease patterns linked to social inequities and lifestyles in industrialized societies;

- health problems that are social rather than medical in nature;
- health problems that tend to be cumulative, long-term and not amenable to curative measures;
- an increasingly aging population;
- health care systems that do not respond adequately;
- systems to health care finance that are outmoded and inadequate; and
- a general public that is changing its social perception of health risks and is expressing new expectations.

It is becoming increasingly clear - even to the general public - that this toll of disease and illness is just as preventable as infectious diseases were earlier, if the political and social priorities are changed accordingly. People expect to live long and to be healthy and independent in their old age, but only some people are changing their health behaviour to support the focus on wellness and quality of life. The challenge for public health and public policy is: to outline the major social, economic and political investments necessary to ensure the health of populations, to translate these investments into an organized community effort, and to make proposals for social mechanisms that will ensure the promotion and maintenance of health for all by the year 2000 (Terris, 1987). This means redefining public policy, the common good and individual responsibility (Milio, 1983).

A new definition of public health that would take us beyond Winslow without losing the key issues he addresses (the health of population, organized community effort and the need for social machinery) could be approached by using the Ottawa Charter for Health Promotion (1986) as a starting point. It could read as follows:

- Public health is the science and art of promoting health. It does so based on the understanding that health is a process engaging social, mental, spiritual and physical well-being. Public health acts on the knowledge that health is a fundamental resource to the individual, to the community and to society as a whole and must be supported by soundly investing in living conditions that create, maintain and protect health.
- Public health has an ecological perspective, is multisectoral in scope and uses collaborative strategies. It aims to improve the health of communities through an organized effort based on:
  - advocacy for healthy public policies and supportive environments;
  - enabling communities and individuals to achieve their full health potential; and
  - mediating between differing interests in society to benefit health.
- Public health infrastructures need to reflect that public health is an inter-

disciplinary pursuit with a global commitment to equity, public participation, sustainable development and freedom from war.

Theoretical base of an ecological public health

Drawing out the implication of an ecological approach to public health requires tracking the theoretical base and epistemology of ecological thinking. There are two ways to do this.

First, one can trace schools of thought in various disciplines that have contributed to or use ecological thinking and have aimed to explain and understand the interactions between humans and their environments (Catalano, 1979). The two extreme disciplines have been biology and sociology, which are both wary of the other's subject matter, as reflected in the heated discussions about sociobiology. The social and policy sciences, however, have recently moved on to debate a new environmental paradigm that applies ecological thinking to the social and political realm (Buttel, 1986; Dwivedi, 1986; *International Social Science Journal, 1986).*

Second, a wide range of literature on health has contributed towards an ecological model of health, ranging from miasma theory (Rosen, 1958) to Lalonde's health field concept (Lalonde, 1974; Raeburn & Rootman, 1988) to models of social health (Cassel, 1976; Kickbusch, 1985; Marmot & Morris, 1984).

Bateson's work (Bateson, 1975, 1979) links these two theoretical strands by providing the idea of pattern. Health would then not be defined in terms of host and agent, person and environment or cause and effect, but as the pattern that connects. An ecological theory of public health must be based on this idea.

Developing a theoretical base for the new public health is challenging and complex. It goes beyond how people and environments fit together and simple ideas of adaptation and balance. It does not just mean shifting attention to the effect of the new threats to health posed by the physical and social environment. It implies another way of interpreting health and the systems that create it. The new public health uses a different set of theoretical premises and methods that are in their beginning stages. Arguments for a more holistic and ecological public health are therefore often supported quite haphazardly. Quotes range from the ancient Greeks to the Australian aboriginals since they seem to express a broader idea of health that concurs with recent rediscoveries. The actions of the pioneers of public health are presented out of context, an example being the famous statement of "politics being medicine at large" by Virchow. As serious, broad academic

studies are lacking, arguments are often constructed with little scientific depth.

The origin of an ecological theory of public health includes disciplines other than health and medical sciences. The goal is to clarify the implications of a new concept of health and of a new concept of public. This dual challenge requires interdisciplinary work, ranging from the biological to the political sciences.

Fields other than medicine that contribute to ecology include biology, anthropology, the social and political sciences, history, history of science, philosophy and literature. Analysing the many disciplines that have contributed to ecology as "a branch of science concerned with the interrelationship of organisms and their environments..." (Webster's third new international dictionary, 1976) also helps to assess whether these disciplines are experiencing a broader paradigm shift in the direction of explaining the world ecologically. Examining the literature on health and ecology can help to identify the exemplars (Kuhn, 1970) of a theory of public health. Comparing these two lines of inquiry can then help to clarify continuities and discontinuities in the social and scientific understanding of the interaction between humans and their environments and the effect of this interaction on health. For example, is the discourse based on relationships of cause and effect or it is based on considering "the totality or pattern of relations between organisms and their environment" (the second definition of ecology according to Websters (1976). Chaos theory (Gleick, 1987) is the most important development of this thesis.

Brewer (1987) has recently attempted to analyze the policy sciences, ecology and public health by discussing the common characteristics of policy sciences and ecology and relating them to public health. Strategies emerge that outline the challenges to an ecological public health:

- countering prevailing norms of fragmentation and specialization in disciplines and professions;
- facing cumulative effects whose combined consequences are very gradual and emerge as a crisis only as thresholds are crossed;
- confronting problems that reach beyond and require the integration of specialized bodies of knowledge; and
- using multiple methods, tightly connecting theory and practice and focusing on contexts and meaning.

Brewer stresses that the anthropocentrism of public health would bring to ecology an additional valuable element by focusing on human health and well-being. Similar discussions can be traced in the social sciences (Buttel, 1986). In particular, Schnaiberg (1980) has developed a model of

interpretation and analysis that enables human action and direction to be integrated into an ecological model, rather than the focus on self-regulation and adaptation that is usually applied in ecological anthropology. The US National Academy of Science (Press, 1987) has a very interesting approach that includes human skills and value possibilities as part of the reciprocal influences between humans and physical environments. The social sciences lack a tradition, however, for outlining the processes by which the social structure and human action positively or negatively affect the physical environment.

Nevertheless, a wide range of research on social health, social integration, social support and belonging could explain how breakdown in the ecology of human interaction seriously affects health. (A WHO publication on the new social epidemiology is being prepared (Badura & Kickbusch, in press). Antonovski's (1979) work on a science of health linked to feelings of belonging and social integration (salutogenis) needs to be given much greater attention than it has received so far. In addition, the word lifestyle needs to be reassessed; the original use of this word in social science was based on the context and meaning of human actions, not on functionalist premises of human behaviour. An ecological theory of health must seriously pay attention to the social ecology of humans and their social development, social relationships, culture, emotions and dreams. Conviviality can be reintroduced (as put forward by Ivan Illich (1973) several years ago) as a measure of social health and well-being.

Finally, the oldest public health problem - inequity in access to health - remains a prominent issue for the new public health, although new forms of social inequity in health have emerged: the rise of single parenting, the feminization of poverty, and the problems of very old people and homeless young people. These forms of inequity indicate the tremendous social and human resources wasted by societies, not only nationally but even more drastically on a global scale.

Based on the literature on health, much needs to be done to overcome the atheoretical and ahistorical stance of public health. Developing a new perspective requires a realistic view of history. Public health has been less attractive to scholars than the rise and power of the medical profession, even when scholars put forth their criticism of medicalization. It is necessary to determine the social theories, political ideologies, scientific schools and discoveries that influence public health pioneers through the various stages of public health have led to its present narrow approach. A political history of public health still needs to be written and much comparative work needs to be done.

For example, it would be very interesting to trace the various influences that have forged the key ideas of the new public health, including the critique of medicine, the wellness movement, mutual and self-help, the women's health movement, the crisis of escalating medical costs, holistic medicine, Eastern philosophies, the demand for social justice, new risk patterns and inadequate political responses. Another example would be to outline the options for public health, depending on whether a functionalist or ecological framework is used. If health is viewed in terms of the concept of humans and machines of nineteenth-century science, working with cause and effect in relation to forces and impact, then public health logically builds its intervention on such premises, using a functional risk factor approach (Terris, 1987). Long-term, diffuse and cumulative effects of human activity on health require another theoretical base and other intervention approaches. The models that have been proposed particularly follow the ecology of human development developed by Bronfenbrenner (1979) for child development. Chamberlin (1984) used this model to construct an ecological model of child health services (outlined later).

The pattern that connects

An even more fundamental consideration should be taken into account. In *Steps to an ecology of mind* Gregory Bateson (1975a) warns against "a mass of quasi-theoretical speculations unconnected with any core of fundamental knowledge". Bateson argues that any investigation works with two types of knowledge: observations and fundamentals. As Kuhn (1970) has outlined, a paradigm shift comes about when the observations and the fundamentals are mismatched, so that the fundamentals cannot explain the observations any more. Bateson says that present-day science cannot explain the world any more, and proposes instead the pattern that connects. A key step in developing an ecological theory of health is understanding as a pattern or relations rather than as a quantitative outcome. A pattern, however, is not fixed but is (Bateson, 1975a) "primarily a dance of interacting parts and only secondarily pegged down by various sorts of physical limits and by those limits which organisms characteristically impose". This makes it possible to understand and analyze health as a process, as proposed by the Ottawa Charter, and to analyze interacting parts in terms of context, meaning and relationships. Bateson (1975b) has outlined "an abstract idea of what we might mean by ecological health". He defines human civilization as (Bateson, 197b):

A single system of environment combined with high human civilization in which the flexibility of the civilization shall match that of the environment, to create an ongoing complex system, open-ended for slow change of even (hard-programmed) characteristics.

Bateson then explains some of these terms in more detail and his definition of high civilization is similar to many of the recommendations on sustainable development. Bateson's concept of flexibility is highly relevant to the theory and action of the new public health.

Bateson (1975b) broadens the idea of adaptability from passive adaptation to more active adaptation that involves upper and lower levels of tolerance, beyond which discomfort, pathology or death occur. Under stress, a variable gets close to its lower or upper level of tolerance and begins to lose its flexibility. In doing so, it influences the other variables and the lack of flexibility spreads throughout the system. An obvious example is that an overpopulated society tries to make overpopulation a more comfortable process, which gradually leads to more fundamental ecological pathology. The propensity of systems to undermine their own flexibility has serious political consequences. Social flexibility is a resource as precious as oil or titanium and must be budgeted in appropriate ways, to be used for needed change. Thus, health can only be maintained if it remains part of a process geared towards sustainability.

Many theories should be challenged with these fundamentals. Bateson (1975b) outlines categories that can explain both physical and social processes within a pattern: flexibility, diversity, context, meaning, levels of tolerance, and form. A new dialogue could then emerge between the natural and the social sciences in outlining an ecological theory of health.

Strategies and approaches

An ecological approach to public health needs to develop strategies that correspond to the new risk patterns. These strategies need to go beyond the tinkering that occurs within the present fragmented systems and approaches and need to find new approaches to local, national and global policies. Two key reports outline a general course of action: *Our common future,* (World Commission on Environment and Development, (1987)) and the *Global strategy for health for all by the year 2000* (WHO, 1981). Both reports are strongly oriented towards policy, and call for closer scrutiny of government actions in relation to environment and health. Proposals for action have been developed based on healthy public policy and sustainable development. Their agendas are remarkably similar, which may indicate a broader paradigmatic shift in understanding

humans and the world and the values and principles that guide governance. These two reports propose to integrate ecological considerations into political and administrative decision-making by using sustainability as a guiding principle. A recent World Health Assembly resolution (WHO, 1989) stresses that health and sustainable development are not only interdependent but reciprocal. Both the environment and health are seen as social resources, as common property that society has an overall responsibility to protect. In an ecological approach to policy, health is part of the ecological wealth of a society. It becomes one of society's key human resources and thus one of the key indicators of sustainable development. The development of health itself must therefore be sustainable.

This leads to new proposals for social investment and political accountability and to the need for new institutional and legal frameworks. Political ecology could provide an analytical approach to examine, analyse and inform government actions and responses to the new risk patterns. Many of these responses need to be based on global cooperation and will and simultaneously greatly influence people's daily lives. If equity, conviviality, sustainable development and global responsibility are the guiding principles of an ecological public health, then both governments and individuals face hard choices.

Our common future (World Commission on Environment and Development, 1987) states that: ''The common theme throughout this strategy for sustainable development is the need to integrate economic and ecological considerations into decision-making''. This need to integrate is also the key theme of strategies for healthy public policy, as outlined in the Ottawa Charter and the Adelaide Recommendations (1988): ''Healthy public policy is characterized by an explicit concern for health and equity in all areas of policy and by an accountability for health impact''.

Comparing the proposals of the World Commission on Environment and Development and the recommendations of the Adelaide Conference, healthy public policy and strategies for sustainable development have common characteristics, as they both:

- integrate ecological and health considerations into political decision-making;
- emphasize accountability for side effects and the impact of decisions;
- promote intersectorality and integrated strategies for action;
- are committed to equity;
- recognize the need for new legal and institutional reforms;
- promote community knowledge, involvement and support;

- advocate investment in the future and take responsibility for future generations; and
- encourage global concern.

Both reports focus on the serious institutional gaps that face societies responding to new ecological problems, and both recognize the need to invent new systems as an institutional challenge of the 1990s. The key themes of both reports are social equity, social investment and social innovation in health and environment, which are guiding principles for sustainable strategies for health and environment.

Consequences of a new public health strategy

An ecological approach moves health from a matter of individual lifestyle and choice to a broad issue for the community. It starts with a basic question. Where is health created? The ecological answer is that health is created where people live, love, work and play. People create health by interacting with each other and with their physical environments. A public health strategy should thus begin with the settings of everyday life in which health is created (rather than disease categories) and strengthen the health potential of these settings. This leads to identifying patterns that constitute health and developing strategies that strengthen such patterns throughout the process of human development. The Ottawa Charter for Health Promotion (1986) suggests that such patterns are strengthened by a public health strategy that promotes:

- an awareness of public policies and their effects on health;
- social and physical environments that support health;
- personal skills development;
- community invovement; and
- public health services that are responsive and oriented towards health.

For example, a strategy to improve the health of schoolchildren would aim to put health into practice as part of the overall school setting and activities and not just as an activity called health education. This could include:

- teaching personal skills and autonomy;
- promoting a positive body image;
- creating a positive social and physical environment for learning;
- involving the community in school activities (using the school facilities for community events, for evening classes on health and environmental issues, and as an information centre on pollution;)
- providing healthy school meals and facilities;

- supporting positive interaction between children and parents; and
- ensuring ecological disposal of school refuse.

The local school would literally become one of the health centres of the town. Industrialized societies are obsessed with creating health centres staffed with medical and paramedical personnel rather than looking for social entities that could be centres of health and supporting them in such a role. Chamberlin (1984) has outlined such a strategy:

> Child health and developmental outcomes are related to parent functioning, which is influenced by both formal (health and human service providers) and informal (family and friends) community support systems. These are in turn influenced by both cultural values and the policies of local, state and national governments. With this approach the focus is on the community as a whole and the relationships between families and their current environments.

The focus of this strategy is to strengthen the community resources that improve the functioning of all families and children, focusing on the total population instead of risk groups.

Chamberlin (1984) proposes five components at community level instead of the highly fragmented and excessively professionalized approaches presently practised:

- a community council to establish priorities and coordinate services
- a community-wide health education programme
- the availability of basic support services for parents
- a consumer advocacy organization
- a reliable assessment system.

Examples of such integrated approaches to child health can be found in the Nordic countries, and the child health statistics show the merit of such an approach. The Victorian Community Health Councils in Australia (Milio, 1988) are a move in this direction. Chamberlin (1984) argues that environmental sanitation is the best model of a systemic approach. It would be ineffective if it only targeted high-risk groups or relied on each individual boiling water before using it. Many community health projects now use these ecological approaches at the level of social action, but most are isolated examples rather than part of an integrated system of ecological community care. This returns to the sustainability of the development of health systems.

Changing expectations and social perceptions

What are the chances of developing integrated policy approaches for the new public health on a large scale? The political pressure for change has increased recently as the social perception of health and environmental

problems, and the health-related behaviours and the awareness of health of certain strata of society have changed. For example:

- Environmental destruction is increasingly seen as an acute new social problem.
- Overall consciousness of health has increased among the middle strata of society, although it is still mainly individually oriented (my health rather than community health).
- More and more people are gaining experience in self-help and mutual aid groups.
- Middle-class consumers are influencing the range of healthy products and their presentation (such as labelling) and producers must respond to substantial shifts in consumer behaviour.
- Some harmful and hazardous products are being phased out slowly under the pressure of public policy and public opinion (such as tobacco, at least in some developing countries).
- Certain health-damaging behaviours are becoming less acceptable and less socially desirable.
- The media show great interest in revealing new scandals related to health and the environment.
- Most importantly, the new global environmental hazards have drawn people's attention to the limited choice for health they can make as individuals.

On the whole, public interest in preventive measures is increasing and the public increasingly expects governments to take responsibility for health and environmental hazards. Data from a July 1988 opinion poll in Canada showed that 77% of Canadians said that they would pay more for a product if it were labelled environmentally safe, and that 56% would be willing to pay two cents more for milk or gasoline to help improve the environment.

Another Canadian poll in Autumn 1987 had interesting political implications: 92% of those surveyed said that corporate executives should be held personally responsible if their company repeatedly pollutes at unsafe levels; 78% were willing to pay higher taxes or prices to improve environmental protection; and 87% were upset about the lack of action taken to protect the environment.

Political ecology

People increasingly perceive health as a social right (Beck, 1986). This trend is considered to be different from the demands for more services

raised in the 1960s and 1970s. Citizens are gradually becoming aware that structural measures and public policies are required to ensure increased health and to reduce such hazards as chemical residues in food, food additives, radiation and pollution. People that have developed a health consciousness as ecologically responsible consumers find it particularly difficult to accept political non-decisions and inertia, as they can see that such responsible individual behaviour is impossible because they cannot control the products for sale, the quality of the air they breathe or the sand in their children's playground. It is also essential to ensure the credibility of the behavioural change models proposed by health education. People can improve their health themselves, but this needs to be reinforced and supported by more comprehensive systemic measures. Healthier choices are rarely easier to make; they are usually more expensive and are only available to a minority of the population, since healthier choices are heavily based on access to information and financial resources. Healthier choices are often still a minority behaviour within cultures that do not make health promotion a priority. Political legitimacy is threatened, as institutions and administrations can no longer fulfil the promise to deliver safety and freedom from harm and to protect the common welfare. This is further exacerbated by an increasing distrust of the medical system, as the medical industry has increased its diagnostic capacity but cannot cure many of the most prevalent diseases, including cancer, joint diseases, chronic pain and AIDS.

Systems of government are therefore challenged to integrate the increasing concern about the environment and health into their policy proposals and their day-to-day politics. Except for some symbolic measures, however, governments do not seem to know how to respond to the combined pressures arising from the technical, legal, social, political and economic dimensions of the problems facing an angry and confused public and press on the one hand, and established power brokers, interest groups and industry on the other. In such a context, sustainable development and *healthy public policy* are frequently ciriticized as being abstract ideas that are impossible to put into practice. They seem idealistic only because there is no experience of putting them into practice and little political will to do so. Unecological and fragmented systems of government cannot see the forest even as the trees are being felled. Many public policies that are taken for granted in industrialized societies were initially considered unfeasible. Imagine the amount of pressure, negotiating and coalition-building it took to cover London with a sewer system.

A concept termed political ecology by Grahame Beakhurst (1979) has

recently emerged within political science. It aims to highlight the political dimensions of environmental and ecological concern, to discern the forms in which power and authority are exercised in dealing with the new ecological issues, ranging from local to international policies and encompassing action by governments and by nongovernmental organizations. As the Brundtland report (World Commission on Environment and Development, 1987) points out, the existing political and economic structures will not ensure human survival: political values and processes need to be transformed to meet the requirements of sustainable development.

Dwivedi (1986) has outlined the plodding development in environmental policies in industrialized countries. Governments in the 1960s and 1970s responded to environmental problems incrementally, using existing agencies to administer solutions. In the early 1970s governments established new administrative units such as environmental protection agencies or ministries for the environment. (In many countries the environmental responsibilities of public health departments were correspondingly reduced). These new units gave environmental issues a new profile and developed new mechanisms such as environmental impact assessments, but their effectiveness continues to be hampered by the economic priorities of governments, despite recent attempts to cooperate globally. Most of these developments were catalyzed by increasing public pressure for action. In some countries new political parties with an environmental agenda entered parliament, since the established political parties were viewed as ineffective.

A new form of decision-making is therefore needed that integrates action and public accountability and that re-establishes political credibility. Science cannot provide the answer, as it can provide more uncertainty. For example, it took great scientific ingenuity to discover the hole in the ozone layer in the stratosphere, but there is still no definitive proof of the harmful health effects of increased destruction of this ozone. The preliminary indications include increased rates of skin cancer, chronic changes in lung functioning and suppression of the immune system. Political decision-makers will therefore be increasingly forced to use political and social criteria to assess risks instead of relying on definitive scientific proof. Trevor Hancock (1989) recently predicted that governments will be forced to respond to the consequences for health of: unsustainable agricultural policies, unsustainable energy use, chemical and radioactive contamination, resource depletion and further urbanization.

These problems and the common global challenges that need to be tackled according to *Our Common Future* present a formidable challenge. The

idea of healthy public policy is therefore crucial because many ecological issues have finally become broad public issues by the effects they have on people's health: the effects on their everyday lives, on their children and on their hopes and fears. The increased concern for health caused by the medicalization of society and the concept of risk factors has turned a somersault. It has produced a public that increasingly demands health and does not accept a lack of preventive action in an area that is clearly governmental responsibility. People used to debate whether a strategy to combat smoking should begin with the individual smoker's freedom to smoke or with the production, pricing, advertising and taxation of tobacco. The tobacco industry ruthlessly exploited this ambivalence by warning that the values of democracy were at stake if tobacco advertising were banned. These issues appear comparatively straightforward compared with the present issues in focus, as individuals can hardly control the harmful substances used to produce the roast and vegetables (or soya steak) for Sunday dinner or at what point of the production process and under whose responsibility toxic chemicals are introduced into the food chain. This raises new issues of legal and political responsibility for harm and new ways to regulate compensation that cannot be explored here (Reich, 1998). Preliminary indications can be seen in the legal measures taken against tobacco companies and against employers that do not introduce non-smoking work areas and subject employees to the risk of passive smoking.

The social perception of risk is changing and influencing people's political response. Demands for action at international, national, state and local levels will emerge, as will proposals for individual strategies and consumer movements to support sustainability. Returning to the McKeown thesis, the health of populations was changed through economic growth and a wider distribution of wealth, pressure for social change and reform, concerted action in many sectors and the establishment of a population-wide system of prevention. Are these factors sufficient to catalyze change in the health of populations at present? If not, how do they need to be adjusted, for example, changing the distribution of wealth globally rather than nationally? To contribute to a more sustainable society, public health must:

- develop proposals for legal and institutional reform that strengthen the promotion and protection of health;
- ensure that the potential effects on health of the new environmental risks are seriously considered in policy decisions at all levels;
- ensure that assessments of effects on health and the environment become part of governmental planning and accountability;
- ensure that the public is fully informed of risks to their health;

- give priority to reducing inequities in health; and
- open the debate on the sustainability of health development itself.

To accomplish this, public health must develop methods and mechanisms that are accountable to the public and that support integrative strategies. As a guideline for institutional reform and developing strategy, the ecology of systems and increased social flexibility and diversity must be considered a societal resource for survival. Many professionals oppose such development, as many portfolios are based on restricted ways of solving problems.

A broad social debate should be opened on issues such as:

- Why not have a minister for health who is really in charge of health, has an appropriate budget to do so and must be heard at cabinet level?
- Why not have a ministry of health and the environment and a ministry of social and medical care?
- Why not consider more carefully how a public good such as health is produced and ensure accountability when health is destroyed?
- Why not accept that the skills needed to promote health are totally different from those needed to cure ill people?
- Why not discuss the balance between individual, social and political responsibility for maintaining health, to create a new culture of health and social responsibility?
- Why not introduce an accounting system within government that makes visible the positive and negative effects of other sectors on health and links it to their budgeting?
- Why not lift the taboo on the appropriation of public goods (and money) for professional and private use and reassess the public ownership of the commons?

This list of questions could be expanded. As the Brundtland report says, many public health issues reflect the fact that people need to renegotiate what kind of society they want as they enter the twenty-first century. Is there any consistency in various societal goals? An intense political and social debate on what and who produces health and what people are willing to pay for it would be a positive step.

- Why should health promotion be organized using the principles used to solve problems in the nineteenth century?
- Why is it acceptable that a middle-class man in Australia lives an average seven years longer than his poorer counterpart and has less disability and pain all his life?
- Why is it acceptable that men take no responsibility for their children and then proclaim that the family is breaking down?

Public health has some hard choices to make. Bateson (1975) says that ecologists face the paradox that, to preserve flexibility (for example, preserving irreplaceable natural resources), ''their recommendations must become tyrannical''.

This raised the most complex social and political issue of all. Are there new ways to define, determine and rank the individual and the common good? This is the ultimate question posed by political ecology. Andrei Sakharov recently stated that, for the USSR at present, ''for the individual ... the question of collective rights is more pressing than that of personal ones'' (interview with *Le Figaro,* 1989). The Brundtland report clearly puts the needs of future generations above the economic expansion of present societies, the health for all strategy requires a transfer of societal resources towards greater equity, to ensure access to the prerequisites for health and basic health care needs. The recent report of the Worldwatch Institute (1989) indicates the need to reduce family size worldwide and emphasizes that: ''Any meaningful effort to slow population growth will depend on heavy investment in the provision of family planning services, improvements in education and health (particularly for women, one might add) and financial incentives that encourage smaller families''. These proposals conflict with the strategies demanded by such international financial institutions as the World Bank and the International Monetary Fund, which blindly expect countries to reduce their investments in education, welfare and health (which, of course, these institutions call expenditures) to promote growth in gross national product.

It is painful to see the McKeown thesis reduced to the incorrect formula that increased gross national product is an equivalent to improving the health of populations. An ecological perspective views the issue exactly the other way around. Health is part of the ecological wealth of a society, one of its key resources, and one of the key indicators for sustainable development. The pattern of health is sustained by the relationships between conviviality, equity and ecology, or as the WHO Constitution stated with great insight in 1948 (WHO, 1988): physical, mental and social wellbeing.

As health - social, physical, mental and spiritual wellbeing - is the outcome of a societal pattern, improved health in a society provides information on the general quality of life (context) and the overall values (meaning) of the society. Health describes the interaction between humans and their environment and indicates their specifically human skills and ingenuity, and potential for innovation and caring (flexibility). Finally, health has to be assessed at a global level. National goals are not enough and need to be supported by new types of international cooperation, monitoring and ac-

countability. As Bateson (1975) says: ''We are not outside the ecology for which we plan - we are always and inevitably a part of it''.

The strategies and mechanisms of the new public health are in their infancy, and must mature much faster than did the strategies of the old public health. A number of key issues need to be brought closer to solution within ten years. Social innovation and political courage are called for (Bateson, 1975): ''... the ecological ideas implicit in our plans are more important than the plans themselves, and it would be foolish to sacrifice these ideas on the altar of pragmatism''.