

Population Health, Sustainable Development, and Policy Futures

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INTRODUCTION

"Population health" and "sustainable development" are labels that describe two related "big picture" analyses of broad social relations that are greatly extended through space and time, and which involve economic, socio-cultural, and environmental dimensions. The purpose of each analysis is to contribute to a better understanding of the human experience with the express concern of influencing public policy so as to maintain or improve human health and wellbeing. However, the specific focus of each literature is slightly different. Consequently, attempts to integrate the two have been quite limited. The purpose of this paper is to consider conceptual linkages between sustainable development and population health, and to reflect upon what these areas of joint concern suggest for public policy.

Given the wide range of ideas and issues bound up in these two sets of literature, it is useful to reflect on the evolution of the concepts central to the discussion: health and development. We then consider intersections between population health and sustainable development, and touch on risk management as a means by which to consider policy issues arising from these intersections.

POPULATION HEALTH: EVOLUTION OF CONCEPTS

Health is an elusive concept. It has had, and continues to have, many definitions: from harmony to perpetual rhythm, from soundness or wholeness to the ability to develop and thrive. It has been presented as an ideal state—complete physical, social and mental wellbeing—and as a contrasting condition—the absence of illness. Some define health as the ability to adapt successfully to change, or as a resource for daily living. Others see it as an independent end-point to be achieved through a certain mix of behaviours and interventions.

Our notions about the *sources* of health—how it might be acquired, influenced, enhanced and/or maintained—are similarly varied and have changed over time. In the pre-modern period, health was considered the prerogative of the gods: good health was a gift; illness was either a punishment for moral

misdeed or a cruel act of fate. The Enlightenment brought about a new focus, one centred on human life on earth—not the heavens—as the source of influences on health. Miasma theorists identified a strong connection between the health of the population and the cleanliness of the environment. In the nineteenth century, the work of Edwin Chadwick and the Sanitarian movement led to the establishment of the public health field.

The twentieth century witnessed the rise of germ theory and the emergence of modern medicine. The remarkable successes that this approach brought to combating disease in the first half of this century led to the post-war belief in "magic bullet" medicine, that is, the widespread expectation that medical science would eventually identify and conquer most illnesses. Good health was thus seen as the result of advances in medicine. In the early 1970s, the widely disseminated Lalonde Report suggested that health was not simply a function of medical care: individuals could assume some responsibility for their own health through "lifestyle" choices. Newer evidence suggests that socio-economic circumstances have immense influence on health. Today, we are beginning to consider the connections between health and developmental sustainability.

Four Questions

In our discussion of the concept of health, it is useful to distinguish between four questions,

each of which tends to relate to a different branch of health-related activity within policy. *Public health* asks: "What must we do to keep people healthy?" *Medicine* asks: "How do we diagnose and treat people?" *Health promotion* is concerned with the question: "How do we improve the health of the population?" Finally, *population health* poses a fourth question: "Why are some people healthier than others?" We discuss each of these questions in turn below.

Public Health: What must we do to keep people healthy?

The public health movement arose from the confluence of the utilitarian ideas of Jeremy Bentham, a widespread interest in statistics, and the growing belief that disease emerged from filth. Miasma theory attributed the sporadic epidemics that devastated many European cities to filth. Poor housing, inadequate sewage and water supplies, foul air, and poor garbage collection all contributed to unhealthy sanitary conditions.

In the early Victorian period, a fascination with statistics fuelled many studies of public health: data was collected, analyzed and widely disseminated. British epidemiologist John Snow used statistical analysis to demonstrate that cholera was spread by contaminated water. Edwin Chadwick (an ardent follower of Bentham and widely considered to be the father of public health) used findings from statistical data to argue for a public response to ameliorate the living conditions of the urban working class.

The Sanitarian movement focused attention on the development and implementation of collective strategies for improving health by changing elements of social organization. Local governments were established with a strong mandate to protect the health of citizens, improve the water supply, establish sewage/waste removal and treatment, create housing standards and authorize inspectorates to enforce standards. Public health nursing traces its origins to this movement, as do many health protection activities, such as the tracking of communicable diseases and mass inoculation programs.

Medicine: How do we diagnose and treat people?

Briefly, the professionalization of physicians, the growth of the modern hospital and the attendant growth of medical knowledge characterize the development of medicine and medical practice as a focus of health.

The professionalization of doctors took different forms in Britain and North America. In Britain, at the urging of Chadwick, death certificates became statutory requirements, and doctors were licensed to provide them. This legal, administrative, and diagnostic function propelled physicians to a central position within an emerging medical hierarchy. In North America, Abraham Flexner's report on the standards of medical schools in the US and Canada ushered in the development of schools of allopathic medicine and contributed to the emergence of the biomedical perspective still dominant today (Starr, 1982; .

The professionalization of physicians was accompanied by the development of the hospital from poorhouse to nursing institution to general hospital to today's highly specialized institutions, where doctors are still central. Increasingly sophisticated diagnostic and treatment procedures have likewise developed within teaching and research hospitals.

Health Promotion: How do we improve the health of the population?

The Lalonde Report, *A New Perspective on the Health of Canadians* (1974), marked an extremely important moment in shaping current understandings about health, both in Canada and internationally. Specifically, it put forth the idea that health does not equal medical care alone. The "health field concept" (Figure 1) developed in the report comprised four dimensions: lifestyle, environment, human biology, and health care. The report recognized that individuals could assume some responsibility for their health through behaviour, choices and actions. This insight, however, was a double-edged sword; its prominence in the Lalonde Report led to an exaggerated emphasis on lifestyle as a determinant of health, an emphasis that has plagued the health promotion movement ever since.

Health Promotion grew out of the Lalonde Report, at least institutionally in Health Canada. The Epp Report, *Achieving Health For All: a Framework for Health Promotion* (1986) extended Lalonde in important ways: it recognized the importance of the social environment, power and control, coping skills, social justice, housing, education, and civil society in promoting health. It also specified action: the need for health workers to advocate and act to improve health. The Epp Report set in motion the most recent major organizational change at Health Canada. It also provoked significant provincial response: many provinces changed their institutional structures to facilitate health promotion.

The Ottawa Charter (1986) is the touchstone for health promotion as it is practiced around the world. It identified five priority areas for action: i) building healthy public policy, ii) creating supportive environments, iii) strengthening community action, iv) developing personal skills, and v) reorienting health services away from curative and salvage activities toward health promotion and disease prevention. Some of these strategies were aimed at behavioural change at the individual level. Some strategies involved a greater appreciation of social influences upon health, and attempted to change institutional structures. Healthy cities/communities projects and related activities (healthy schools and community recycling programs, for example) were part of this initiative. Many similar activities helped to build community relations and increase a sense of social cohesion.

Increasingly, proponents of health promotion recognized that the many influences on health interact in complex ways. There are at least twelve critical determinants of health, including social support networks, education, employment and working conditions, social environments, physical environments, personal health practices, healthy child development, biology and genetic endowment, health services, gender, and culture .

Population Health: Why are some people healthier than others?

While health promotion recognized that there were many determinants of health, it did not engage in the empirical research necessary to identify and explain the correlation between social gradients and health

status. Population health amasses population-based evidence in a systematic way in an attempt to understand *how* and *why* different factors influence health. This body of research suggests that social environments have a far stronger impact on health than do individual behaviours; in addition, the relative impact of health care, the physical environment and genetics are far less critical to health than socioeconomic factors. A central research focus of population health is the attempt to understand these social-structural dimensions of health. In this respect, however, it has been limited by the available data.

The most important observations to emerge from the population health perspective derive from four related bodies of research relating to: early childhood development, social and economic gradients, work and working conditions, and social networks and supports (Figure 2). Contributions from each area of research raise important considerations for policy, as discussed in greater detail below. Together, they have stimulated within the population health framework the notion of a socio-biological translation, an attempt to understand the links between material/perceptual conditions of people's lives, and the biological responses these produce within the body .

Early Childhood Experience (Biological Embedding of Life Experience)

Early childhood experiences have a profound impact on biological development. Early childhood includes, for example, "windows of opportunity" for language development and learning capacity. The experiences of children during these periods of development are biologically "embedded" and have a lifelong impact on health. There is ample and convincing evidence to show that children who have a healthy, stimulating start in life have fewer health and social problems later in life (Hertzman and Weins, 1996; Wadsworth, 1997). Similarly, the cumulative impacts of experiences over the life course, such as the effects of periods of unemployment, divorce, or emotional stress can have pronounced effects on health . Policy considerations that emerge out of this dimension might include policies that invest in children (early childhood education, nutrition) and in parents (support for expectant mothers, parenting skills, financial and emotional support) in order to yield lifelong health benefits for children.

Social and Economic Gradients

Another central observation in the population health framework is that material conditions have a profound impact on life chances, independent of disease. Health-threatening or enhancing experiences follow both from material conditions of life and from the social meanings we attach to our relative positions within social hierarchy . Gradients in health status are mirrored in gradients of socioeconomic status, and relative material equity seems to have a substantial influence on both the slope of health gradients and overall health status rankings. Not surprisingly, perhaps, greater material equity is associated with better overall health status. Here, policy considerations might focus on economic redistribution in order to reduce disparity and improve health.

Work and Working Conditions

Work and working conditions can influence health. Recent studies of the British civil service (The Whitehall Studies) indicate that a lack of control over work contributes significantly to ill health . In fact, according to Marmot, lack of control in a work environment is the most significant contributor to heart disease, even after the effects of smoking, alcohol consumption, nutrition and exercise are considered . The impact of work on health is heightened when examined in conjunction with income: those with lower income levels have poorer health . Recent studies in Canada by the Institute of Work and Health are less conclusive but support the general findings of the Whitehall

Studies. Policy implications might consider how to encourage employees' sense of control in the workplace. Here, intersectoral collaboration between governments might be required.

Social Networks & Supports

Social supports, which may be defined as any connections to family, friends, and community, are also deeply important to health status. They can stimulate development, help to buffer stress, and provide material and emotional support. Policy implications for this dimension of socio-biological translation would have to consider investments in social cohesion: how do we maintain and strengthen social supports?

There are many parallels between the development of concepts in health and those in development. Two are especially relevant here. The first of these is that, over time, our focus of attention for both health and development has oscillated between the individual and the collective. The second, related, notion is that of the "scientific solution" (which in health takes the form of the magic bullet), the idea that with enough knowledge, humans can ultimately control factors such as disease, the natural world, economies, and societal relations. In both health and development, we have experienced a shift from a premodern notion of collectivity to an Enlightenment sensibility of the rational individual as separate from nature. Coupled with that shift came the notion that rational humans could control and use to their own ends the natural world. In both health and development, we have begun, more recently, to move toward a new notion of collectivity and connection to the environment; human wellbeing is understood to be inextricably linked to economic, social, and environmental relations. These in turn are intertwined. Below, we discuss the evolution of concepts in the field of sustainable development, examine how the three themes of economy, society, and environment interconnect, and discuss the potential challenges and rewards of their integration for health policy.

SUSTAINABLE DEVELOPMENT: EVOLUTION OF CONCEPTS

There are many definitions of sustainable development [a background paper to the World Commission on Environment and Development's *Our Common Future* identified 81 definitions]. Ambiguities arise from the multiple interpretations that can be applied to both words, and the multiple motives that produce interpretations. The preamble to the Charter of the UN defines development as "promotion of 'social progress and better standards of living in larger freedom'" — essentially, improved quality of life. Sustain can mean to hold onto or to keep, to endure, or to provide conditions for the continuance of being. The idea of sustainability can be applied to social relations (e.g., sustaining civil society), to physical bodies (sustaining life of specific animals or plants), and to ecosystem relations (sustaining the biosphere of specific regions or of the entire globe). The most popular definition of sustainable development comes from the WCED report *Our Common Future* (1987), which defines it as development that "meets the needs of the present without compromising the ability of future generations to meet their own needs" (p. 43).

Globalism

Understanding the significance of the emergence of a global consciousness is fundamental to understanding the evolution of sustainable development. The last half of the twentieth century has witnessed the rise of a global consciousness in Western (and, increasingly, international) thought. The ontological foundation of this consciousness (i.e., what globalism assumes about the nature of the world) is that the world is an interactive and continuous set of relations: we belong to one giant ecosystem as opposed to a series of disparate countries, economies, societies, etc. The sequence of this evolution in thought takes us from economic and social development through to environmental sustainability.

The wide-reaching popularity of globalism as a basic worldview has arisen for many reasons. The space program is one major factor. It produced biospheric images of the globe, our first look back at ourselves on a planetary scale. This "eye in the sky" image, one which world maps could not achieve, significantly enhanced human appreciation of the wonder of the natural world. The space program also facilitated the development of satellite technology, making global telecommunications possible and thus enhancing our experience of "the global" while extending the reach of markets. Technological and theoretical developments in the broad spectrum of earth sciences (atmospheric, geologic, biological) have also contributed to this ontological understanding. The emergence of popular consciousness in terms of "environmentalism," whether manifest within formal institutions or as individual behavioural change (recycling, dietary practices, spending patterns) is evidence of the influence of a global consciousness.

Many factors are cited as contributing to the global environmental crisis that precipitated the commissioning of the WCED in 1983. Reid (1995) identifies three overarching themes: the increase in human-related activities and their impacts and an accompanying decrease in the resources of the planet; population growth; and growing inequity between rich and poor (within and between nations). In addition to these, others cite rising levels of pollution, imbalances between social and natural capital, and unsustainable consumption patterns as the driving forces behind the creation of the commission .

FROM ECONOMIC TO SUSTAINABLE DEVELOPMENT

It is useful to think about sustainable development in terms of three areas: economic sustainability, social sustainability, and environmental sustainability. Historically, development has been thought of mainly in terms of economics. Early views of development were directed at colonies and their inhabitants. Colonial powers declared themselves to be "civilizing" influences whose mission it was to enlighten native populations by the introduction of Western/European religion and values. By the nineteenth century, and into the twentieth, development was defined as productivity; the missionary zeal that subtended earlier colonialism was replaced with a zeal for technological and economic infrastructure, which were regarded as forces that would further "civilize" so-called Third World or underdeveloped countries. More recently, however, we have been compelled to consider the effects of economic development on society and on the environment, and to question the Western biases and imperatives behind issues of development.

Economic Development

Although the General Assembly of the United Nations commissioned the WCED in 1983, the UN's role in fostering notions of development precedes *Our Common Future* by more than two decades. In 1962, the UN published *The Development Decade: Proposals for Action* as a blueprint for the first development decade (1960-70). The focus of the first decade was on rapid industrial expansion and followed largely from the work of W. W. Rostow (1960), who proposed a model of economic development based on five stages: i) the traditional society, ii) preconditions for take-off to into economic growth, iii) take-off into self-sustaining economic growth, iv) drive to maturity, and, v) the age of high mass consumption. Rostow's theory, based on the experiences of western industrialized nations, gave rise to the view that "Third World" or "underdeveloped" countries might be fast-tracked into becoming high mass-consumption societies by rapidly expanding the preconditions for economic growth. In so doing, it was postulated, overall standards of living would rise. Colonial attitudes toward the non-western world were also embedded within this view.

At the time, there existed an enthusiastic (if perhaps naive) optimism about the power of technology and science to improve standards of living worldwide. Thus, international development emphasized the creation of infrastructure: roads, development of electrical generating capacity (especially hydroelectric power), communications systems, etc. Most countries, for example, wanted an international airport and a Western-style teaching hospital. Growth of GNP was taken as the main indicator of progress. Underdeveloped countries, predominately in the Southern Hemisphere, expressed concerns about social development

(malnutrition, infant mortality, education and literacy, landlessness, access to primary health care, etc.), but the main activity of this era was the development of industrial infrastructural support.

Current ideas of sustainable development have begun to recognize that economic development has social and environmental consequences. These themes in development are discussed below.

Social Development

The second development decade (1970-1980) witnessed a shift in emphasis from "things" to humans. Although economic indicators such as the GNP suggested improvements in much of the world, social conditions did not seem to be improving. Some countries (Mexico and Brazil, for example) were plunged deeply into debt in the aftermath of the energy crisis in the early 1970s, and social conditions worsened.

At the same time, developments outside the UN had a significant impact on shaping predominant views. The Club of Rome's *Limits to Growth* thesis, for example, was hugely influential; Prime Minister Trudeau, for example, met with representatives of the group at least three times in the months prior to the formation of Canada's Department of the Environment. Georgescu-Roegen's entropy thesis (energy is neither created nor destroyed, but transformed; economic systems tend to use non-renewable resources to maintain low entropy which cannot continue indefinitely) and *What Now: Another Development* (1975), published by the Dag Hammarskjold Institute in Sweden, held similar sway. Influential also were the experiences of prior development projects (the ways, for example, that the Aswan Dam fundamentally altered bioregional ecosystems), and the ways that economic development changed traditional social relations and threatened cultural practices. The UN Research Institute for Social Development, established in 1963, published the *International Development Strategy* in 1970. This document was intended to stimulate a new form of integrated development, one that would take into account the interactions between resource use, technology, economic development, and cultural factors leading to social change. The UN Environmental Program and the UN Conference on Trade and Development sponsored a joint symposium on the "Pattern of Resource Use, Environment and Development" held at Cocoyoc, Mexico, in 1974. The Cocoyoc Declaration stated that the purpose of development "should not be to develop things, but to develop man [sic]" (quoted in Reid, 1995, p. 45).

In the late 1970s and early 1980s, the UN established three independent commissions on development. The International Commission on International Development Issues (the Brandt Commission) was created in 1977. It issued two reports: *North-South: A Programme for Survival* (1980) and *A Common Crisis* (1983). These drew attention to the fundamentally unequal relations between northern and southern hemisphere countries, to the inequality that exists within nations, and to ways in which this inequality inhibits human development. The Independent Commission on Disarmament and Security Issues (the Palme Commission) was struck in 1980, and reported shortly thereafter on the unsustainability of nuclear weaponry. The WECD (the Brundtland Commission) was struck in 1984, and reported in 1987.

Environmental Sustainability

The WECD had three objectives: i) to re-examine critical environmental and development issues and to formulate realistic proposals for dealing with them, ii) to propose new forms of international co-operation on these issues in order to influence policies and events in the direction of needed changes, and, iii) to raise levels of understanding and commitment to action of individuals, voluntary organizations, businesses, institutes, and governments. The commission's philosophy completes the transition from a focus on the "big economics" of infrastructural projects to one of smaller-scale economic developments coupled with a wider scale of human development. The commission observed that "many development trends leave increasing numbers of people poor and vulnerable, while at the same time degrading the environment. How can such development serve next century's world of twice as many people relying on the same environment?" They decided that "a new development path was required, one that sustained human progress not just in a few places for a few years, but for the entire planet into the distant future". The commission rejected the view that the environment could be understood separately from human

development. It also recognized the futility of development efforts that did not understand the fundamental role that inequity (inter- and intranational) plays in perpetuating unsustainable practices of environmental degradation, resource consumption, and cultural upheaval.

The WECD gave way to the Earth Summit, held in Rio de Janeiro, Brazil, in 1992, and to ten other conferences held since then (the so-called "Rio cluster"). All of these activities have reinforced an awareness of the interconnectedness of global relations in their various economic, social and environmental dimensions.

THE MULTIPLE SCALES OF SUSTAINABILITY: RETURN ON INVESTMENT

The transition from the earliest round of "development as economic growth" to "development as sustainability" has led to a relative repositioning between the three major themes of economy, society and environment. Social and environmental concerns are no longer considered to be add-ons to economic issues. Yet economic issues still exert a major influence on development activities. As they relate to development, economic, social, and environmental concerns stand in tense relationships both with each other and with time and space (Figure 3).

Economic pressures tend toward short-term concerns (under ten years); the social tends to focus on the medium term (i.e., the life span of humans: sixty to eighty years); and environmental or ecosystemic relations tend to focus on the long term (unspecified but theoretically limited: the sun will eventually burn out). Spatially, economic concerns tend to focus on specific locations (e.g. production zones), social concerns tend to focus on community/national relations, and ecosystemic concerns tend to focus on the global village. When we look at these spatial and temporal relations, it is clear that population health concerns most closely follow those of the social sphere in that the research focus tends to be on the lifespan of humans in specific communities and nations.

Although the epistemology of "sustainable development" involves an appreciation of a "big picture" in terms of both spatial and temporal scales of relations, behavioural incentives tend to privilege the here and now. One challenge to policymakers, then, is to create policy that takes into account not only short-term gains, but also medium and long-term outcomes.

Economic Return on Investment (Short Term: Five to Ten Years)

Economic concerns have a strong positive time preference, in that pressures tend to favour the here and now. Investors seek rates of highest return in dynamic world markets (witness TV ads for mutual funds) and the time horizon of investments (as opposed to investment strategy) tends to be relatively short. "Poorly performing" investments are traded in favour of those capable of generating higher rates of return. Investors in the global market are typically distanced from the sites of their investments, and have neither an experiential connection with those involved in production processes, nor much understanding of how those processes impact upon workers' lives. The "here" of investors' "here and now" concerns typically involves their immediate living space (a small-scale community-based geographic area), not the entire set of relations involved in production, not the distant others who also inhabit the planet, and not their future generations. The tendency, then, for economic activity is to favour development in the present with small-scale space and time activities.

The often massive gains in personal wealth that can be made by supporting economic growth entice people to put their individual interests above those of others. The monetary benefits derived from investing in high-profit, if unsustainable, economic development are not distributed equally; this inequality strongly

correlates with highly unequal political/military power relations within "developing" countries and between "First" and "Third" World economies. Indeed, the corrosive impact of this very inequality is a major influencing factor cited in both sustainable development and population health literatures.

The combination of positive time pressures and inequalities in power relations as they relate to development poses a fundamental problem for practicing sustainable development. Even if most investors agreed to invest only in "sustainable" economic development (assuming a generally acceptable and workable definition could be established), the tendency would still exist for unscrupulous investors to seek profits from unsustainable developments, which might be defined as such because of their draw-down of non-renewable resources (minerals, oil, potable water), degradation of the environment (erosion, forest destruction), or impact upon human settlements and cultural traditions.

Return on Social Investments (Medium Term: Sixty to Eighty Years)

The strongest intersection between population health and sustainable development lies in the recognition that both development and health must place increased emphasis on the social context. The "social" return on investment is typically measured over the course of the human lifetime: sixty to eighty years. Historically, the economic concerns of the first development decade tended to override social concerns—big projects and infrastructure were key. Over time, there has been an increasing appreciation of the centrality of social relations to "development." There has also been a fundamental shift in thinking—at least within the community economic development and environmental literatures—of how the practices and routines of everyday life are bound up in both environmental and economic processes. In other words, economic, social, and environmental spheres of development are increasingly seen as integrated, even if their spatial and temporal domains are slightly different. Despite this greater integration, the different time scales complicate investment in sustainable development.

Return on Environmental Investment (Long Term: 100 to 200 Years)

Environmentalism, or the consciousness of ecosystemic relations inherent in the notion of sustainability, forces consideration of the longer term. It also attempts to bridge geographic distances and to improve awareness of the spatially extended sets of relations involved in production and consumption. The life span of humans makes it extremely difficult to appreciate the spans over which certain ecosystem processes unfold: global warming, desertification, food chain accumulation of toxic substances, and depletion of non-renewable resources all progress slowly, incrementally. The distance between sites of extraction or manufacture of products and sites of consumption further inhibits appreciation of the means of production and its impact upon the people involved in or near production (wages, working conditions, exposures, loss of land, experiences of violence, etc.). It is extremely difficult to document, and even more difficult to knowingly experience, the effects of global activities upon the health status of humans or the viability of human life. It is also difficult for people to relate to future generations. Yet these spatial and temporal reaches are necessary to environmental sustainability.

The Political Dimension: Short Term Return on Investment (Three to Five Years)

In addition to economic, social, and environmental dimensions, one must also consider the *political* dimension, absent from the discussion thus far. Even more than economic investments, political investments tend to demand short-term returns. Governments are generally limited to thinking in terms of election horizons—four or five years, typically—and are loath to take on issues (especially unpopular ones) beyond that horizon. In addition to facing severe pressures from many constituencies to develop policies that favour economic development, politicians face pressures from the public to maintain a sustainable health care system. For most members of the public, this translates into maintaining or improving the services they currently receive, or that they are told are necessary by various media reports on health care. Physicians, allied professionals, medical technologies industries, and patient/disease advocacy groups deeply influence public opinion as to what constitutes medically necessary interventions. By their very nature, health care services exert a constant pressure to provide more because more can always be done.

The longer term, intersectoral nature of issues within population health and sustainability frameworks poses particularly difficult challenges for the political sphere. Among these are: developing the communications strategies required to bridge the gulf between long-term processes and short-term expectations, developing the administrative/organizational capacity for trans-sectoral planning and collaboration, and enlisting the support of new partners in changing the service culture of Canada. For example, we need to expand concepts of health to include the organization and quality of work, early childhood experiences, etc., while at the same time seeking the highest level of operating efficiency possible from services provided. The sustainability of health care systems is enhanced if the right service is provided to the right person at the right time in the right setting .

RISK MANAGEMENT: HOW TO CONSIDER OUR OPTIONS

Every choice involves loss as well as gain, if only the loss of opportunity that arises when one decision is taken as opposed to another. Risk management provides a way to consider and balance the gains and losses as one contemplates the short, medium, and long-term consequences of decisions.

Ultimately, population health and sustainable development are similar, completely consistent, "big picture" frameworks. But to date, different aspects of the "big picture" have been stressed inside each literature. These two sets of ideas can result in a new orientation for health policy. Taken together, they suggest a number of priorities for seeking returns from public policies. These are best described in terms of short, medium and long term returns on investment. Examples appear in Appendix A.

PRELIMINARY CONCLUSIONS

It is clear that the major overlap between population health and sustainable development is in the connection between social sustainability and the socio-economic influences on health. While the physical environment is recognized as one of the determinants of health in population health, it has not been considered to be nearly as important as socio-economic factors. The marriage of sustainable development and population health, however, would dictate that long-term environmental outcomes must also be considered when creating policy. Thus, when creating policy for health, we must consider not only the short-term, but also the medium, and, to some extent, the long-term goals and outcomes of those policy decisions.

The convergence on the social aspects of health by the two big picture views offers a particular challenge to policy development. Recently, for example, the Canadian government required sustainable development plans for all its departments. The resulting plans were described by the Auditor General's Office as relatively successful in the areas of economic and environmental sustainability, but significantly weaker in the area of social sustainability. It seems somehow difficult to develop clear and widely acceptable policy that contributes to social sustainability.

This study may help to clarify one of the obstacles to the development of strong health-related social policy. The time scale for return on investment in the different areas of sustainability is instructive: if returns are measured in only economic investment terms, the time frame for social investment becomes too long. Similar difficulties have some impact on the development of long-term environmental policies.

Distinguishing between the time frames is a useful step in that it may avert direct competition between the three time frames of sustainability. This leads to the development of a policy envelope that considers short, medium and long-term policy initiatives separately, as complementary rather than competitive factors in the creation of policy. The focus thus shifts from one of competition *between* scales of sustainability to

competition *within* each scale; we could choose the best of competing short-term policies, for example, without sacrificing the future. It would then be possible to consider what the best overall investments might be at each level. Here, risk management might be an excellent tool to support decisions.

It is becoming increasingly clear that all three time frames must be considered, not only in terms of policy, but also in terms of politics. Paradoxically, it may just be that the greatest short-term political gains are to be had from the demonstration of a commitment to a policy mix that addresses not only the present situation, but also considers medium and long-term returns.

APPENDIX A: EXAMPLES OF THREE SCALES OF INVESTMENTS

Some Examples of Short Term Investments

1. Investment in sustainable health care systems

- responding to citizen concerns about the quality and accessibility of health care
- commitment to stable long term funding for provincial systems
- supporting proven effective interventions at both individual and population levels
- eliminating services that have not been demonstrated to be effective
- increasing effective activities aimed at demand reduction including care management and primary and secondary preventative activities (fluoridation of water, immunization; treatment of hypertension and diabetes)

2. Investment in Food and Drug Safety

3. Investment in Emergency Response Procedures

Some Examples of Medium Term Investment

1. Investment in children

- responding to concern about maternal care and support during and after pregnancy
- responding to windows of developmental opportunity

2. Investment in activities that stimulate social capital

- support for healthy schools, workplaces, neighbourhoods and communities

3. Investment in Vulnerable Populations

- special support for certain types of behavioral change directed to vulnerable populations

4. Programs that favour equity

- redistribution of resources
- maintain and increase the strength of universal programs that increase access to support.

Some Examples of Long Term Investments

1. Investment in intergenerational mobility

- long term return for vulnerable groups

2. Investment in economic development sensitive to ecosystem of natural and human dimensions

- consider long term consequences of short-term investments
- consider investment in alternative energy sources and other technologies that reduce stress on the physical environment
- consider consumption patterns

3. Environmental regulation and monitoring of drawdown of resources

- Risk manage long term implications

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