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Health in the Context of Sustainable Development

Background Document



World Health Organization

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Health in the Context of Sustainable Development

Background Document

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for WHO Meeting:
“Making Health Central to Sustainable Development:
Planning the Health Agenda
for the World Summit on Sustainable Development”

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World Health Organization

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PREFACE

This document has been prepared as a basis for discussion at the WHO meeting “Making Health Central to Sustainable Development – Planning the Health Agenda for the World Summit on Sustainable Development” held in Oslo, Norway, from 29 November to 1 December 2001. It represents a point of departure, rather than a definitive account of all issues relevant to health and sustainable development. There are many gaps to be filled, and issues still to be addressed. Thus, this document should be regarded as work-in-progress.

The document draws, *inter alia*, on the work of several individuals who prepared working papers in advance of the meeting. In this regard, we would like to thank Eric Buch, Ron Labonte, Tony McMichael, Gordon McGranahan, John Last and Devra Davis for their significant contributions. For ease of readability, we have omitted references, tables and figures from the document. However, these are available from WHO on request.

As has been emphasised in the document, the concept of sustainable development is an elusive one, and its relationship with health highly complex, variable and subject to a large number of interacting factors which influence the relationship. We are only now starting to come to terms with this complexity, and to understand what the implications are for the health sector, and for those sectors outside of health, in acting on this knowledge. There are no simple solutions for the myriad of problems we face – and no single issue can be tackled successfully by experts in a single field or a single sector of society.

How we reconcile economic development with health and sustainable development is a difficult balancing act, involving many trade-offs. What is the right mix of development choices that balance long-term health and well-being with short-term gains? What measures and indicators should we be basing our development choices on? What experiences do we have to help us better align development policies with health objectives? What are some of the “win-win” strategies we can advocate for – that address not only health improvements, but also environmental improvements and contribute to economic development?

What are the key diseases/conditions/risk factors, both present and future, that threaten sustainable development? What are the most pressing and immediate health problems to be tackled – and the interventions that may help lift the poor out of poverty? What are the key issues we need to be concerned about in relation to the process of globalisation? How do we maximise the opportunities for health, and minimise the threats? How do we address the health dimensions of the complexity of problems related to natural resource depletion, to environmental degradation, to unhealthy lifestyles and consumption processes? What are the key issues and strategies needed to address these at the global level? At the country level? What have been the obstacles, and what can we learn from the wealth of experience we already have?

These are some of the issues we hope to tackle in the course of the Norway meeting, and well beyond. This will help us clarify what we want to emerge from a health perspective on sustainable development. We look forward to working together with our partners in further developing the health agenda for the World Summit on Sustainable Development.

We sincerely thank the Norwegian Government for their generous financial support, and for hosting the meeting.

YASMIN VON SCHIRNDING
FOCAL POINT: AGENDA 21

1 | INTRODUCTION

1.1 Background and Context

The term sustainable development, as originally conceived by the 1987 World Commission on Environment and Development (the “Brundtland Commission”), was meant to entail “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”. It was coined as part of an effort to bring “environmental” issues into the mainstream of development, recognising that in order to address the escalating problems related to the environment, the root causes which lay in the broader development process and the global economic system needed to be addressed.

As originally articulated, ‘sustainable’ captured the environmental issues (assumed to centre on the needs of *future* generations), while ‘development’ captured the economic/poverty issues (assumed to centre on the needs of the *present* generation). The concept has since been broadened, in recognition of the non-environmental aspects of sustainability, and the non-economic aspects of development.

Following the Brundtland Commission and its report “Our Common Future”, in 1992 the UN Conference on Environment and Development (UNCED) took place – the largest gathering of heads of state ever held. This led to the Rio Declaration on Environment and Development, Agenda 21 – a global programme of action on sustainable development, and to a number of specific global conventions.

Principle 1 of the Rio Declaration on Environment and Development states that “Human beings are at the centre of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature”.

Chapter 6 of Agenda 21 takes this principle further, stressing the need to protect and promote human health, with emphasis on meeting primary health care needs, particularly in rural areas; control of communicable diseases; protecting vulnerable groups; meeting the urban health challenge, and reducing health risks from environmental pollution and hazards.

Thus, underlying the concept of sustainable development is the increasing recognition that the goals of sustainable development cannot be achieved when there is a high prevalence of debilitating illnesses (for example diseases of poverty), and the health of the population cannot be *maintained* without ecologically sustainable development. In this respect “ecological” has both social (as in social capital), as well as physical (as in natural capital) dimensions.

If development occurs in unsustainable ways, population health gains may accompany improving economic conditions in the short term, but the health gains might not be sustainable in the long term. Thus, time scales matter with sustainable development and health.

Social factors such as political instability, violent armed conflicts, discrimination, inequalities and inequities (within, and across, generations) are all inimical to health, and to sustainable development. Health and sustainable development thus has an ethical or moral dimension, as well.

This paper considers some of the complex interconnections between health and sustainable development, and the challenges they present to policy makers. We start off by considering some of the key conceptual issues that are relevant to discussions of health and sustainable development, and then highlight the major trends in world health over the past decade that have a bearing on sustainable development.

We subsequently consider issues in relation to the key underlying themes of poverty, globalisation, and environmental degradation and resource use. We then look at examples of selected intervention strategies to address the disease burden, as well as actions needed to strengthen the health system. This is followed by a discussion on the need to involve sectors outside of health, in addition to the health sector itself.

2 | CONCEPTUAL ISSUES IN SUSTAINABLE DEVELOPMENT

2.1 Concepts and Terminology

In its crudest form, the term sustainable development is used to refer to achieving an economic system that can continue to grow, at least over the foreseeable future. Recent insights have extended the concept by placing the human-made economic system within the wider biosphere: “sustainability” in this context thus means that economic development must occur within the constraints of maintaining intact the ecosystems that support human societies.

An ecosystem is a mutually interdependent group of living organisms in a particular environment. It may be as small as a drop of water or as large as the entire biosphere. Humans, like all other living organisms, are **interdependent** with other species that share their ecosystems. This is especially true of the biosphere considered as an ecosystem. Humans, however, have greater capacity than any other species to manipulate and exploit ecosystems for their own benefit. In the context of human health, and the human dimension in general, “ecosystems” refer to the physical, economic and social conditions that support human life. Thus, one may refer to the “urban ecosystem” or to agricultural ecosystems, for example.

“Environment” in this paper, except where otherwise indicated, includes the physical, biological, social, and cultural factors that can influence health, either directly or via their impact on essential life-supporting ecosystems. The environment and these life-supporting ecosystems are affected by many natural forces, but mostly they are influenced by human activities.

Some parts of the environment can be described as ‘the global commons’ – they belong to everyone, or to no one, are not owned by particular nations, corporations, or other special interest groups. The global commons include the atmosphere, the earth’s climate, the oceans, the water, and the world’s stocks of biodiversity. All are integral parts of essential life-supporting ecosystems.

In animal and plant populations, the size of the population and its level of “health” is an indicator of the “carrying capacity” of the environment for that species. That is, the composition and assets of a species’ environment determine the maximum number of individuals of the species that can be supported. For that species, this number is the “carrying capacity” of its local habitat. There are fluctuations of population size around that number as conditions vary over time. Populations of the human species, uniquely, are not fully constrained by given environmental conditions. Via culture and technology, humans can *increase* the carrying capacity of their local environments - at least temporarily.

2.2 Sustaining Population Health

A basic conceptual difficulty is that we have only, within the past several decades, entered a world in which, first, there is evidence that humankind in aggregate is beginning to overload the planet's physical carrying capacity (as evidenced by climate change, stratospheric ozone depletion, and widespread biodiversity losses), and, second, we now have the beginnings of an understanding of the nature and functioning of complex ecological and other large scale biophysical systems. We are still struggling for an appropriate, shared understanding of these issues – of how a weakening of Earth's life-support systems might impact on human societies.

The current international security crisis has, meanwhile, thrown into sharper relief the issues of (widening) global economic inequality, exploitative trading relations, conflicts over dwindling regional (e.g. fresh water) and global (e.g. oil) resources, and the erosion of social capital linked to economic development policies (e.g. structural adjustment programs). Even as the creation of material wealth accelerates, the way in which this wealth is distributed, has implications for social and political sustainability.

Throughout much of this discussion, however, human health has been seen as somewhat of a secondary issue - an incidental "beneficiary" or "casualty" of the development path. While we must recognize the important role that health plays in economic development, in our policy discussions, we have not yet well understood that "health" is also an ecological characteristic of populations, reflecting the wider conditions of the social and natural environments. Health, in this context, is not merely the absence of disease or infirmity, but is a complete state of physical, mental and social well-being – and, we might add, environmental well-being. It is also a positive concept, emphasising social and personal resources as well as physical capabilities.

We tend to think about health primarily at the personal and family level, however. Indeed, we tend to commodify it, as an asset that can be negotiated via personal behavioural choices and personal access to the formal health care system. Yet it is important to realise that the health of a population is a reflection of the level of biological (including mental) functioning, as permitted by the conditions of the environment.

The central issue in all of this is that the sustained good health of any population, over time, requires a stable and productive natural environment that: (i) yields assured supplies of food and fresh water, (ii) has a relatively constant climate in which climate-sensitive physical and biological systems do not change for the worse, and (iii) retains biodiversity (a fundamental source of both present and future value). For the human species, as a "social animal" in the extreme, the richness, texture, stability and equity of the social environment (i.e. "social capital") is also fundamentally important to population health.

Viewed thus, population health becomes more than either a causal input or an incidental consequence of economic development. It becomes a central criterion. The purpose of "development", presumably, is to improve the conditions and enjoyment of life for human societies (and to do so in a way that entails sharing those benefits equitably). Thus, if our development path is not conducive to sustained improvements in health, then it is not "sustainable development".

Several principles may be of relevance regarding equitable and sustainable development. These include the following:

- Development is a qualitative process which encompasses goals as well as means. Quality of life for humans, and equity, which may include inter-species equity, are among the goals of development.
- There is explicit recognition that the socio-ecological system is open, i.e. it uses the environment both as source and sink for its activities.
- Natural capital (natural resources, environment as sink, global life-supporting processes) is complementary to, and not substitutable for, other forms of capital (manufactured, human, social) and has intrinsic value ("nature has a good of its own") as well as instrumental value. The same can be said for human capital, eg human health.
- Development is equitable within and among generations.
- Decisions are decentralized to the extent appropriate, democratic, participatory.
- Decision horizons consider various space and time scales dictated, inter alia, by environmental processes.
- Decisions are "conservative", recognizing (a) the irreversibility principle i.e. delaying the irreversible extraction of a resource may derive a value from increased knowledge acquired through the delay, and (b) the precautionary principle i.e. 'better safe than sorry' – where the evidence suggests that a risk might exist, it is prudent to act so as to eliminate or minimize the risk even if the evidence is inconclusive.

(ADAPTED FROM LAST 2001)

'Health' and 'sustainable development' are complex entities, in which the whole is greater than, and often different from, the sum of the parts. The relationships between effects and causes may be indirect, circular, and difficult to unravel. They may be synergistic or antagonistic, and they may vary with the geographic, political, economic and cultural setting.

Good health usually facilitates development, and development often promotes improved health. However while improved health may be a prerequisite for development, some behavioural determinants of health, such as attitudes towards the environment, and people's lifestyles and consumption patterns, can impede the sustainability of the development process in the longer-term. Equally, development which is economically desirable e.g. in agriculture and industry, may have harmful consequences for health and the environment.

However one chooses to interpret it, fundamental to the concept of sustainable development is that it rests on three pillars – the social dimension, the economic dimension and the environmental dimension. For development to be sustainable, all three dimensions need to be addressed in a balanced and integrated way, with due regard given to meeting both present as well as future needs. The environmental, social and economic dimensions should thus be seen as mutually enforcing, interdependent entities of sustainability. In this context, health provides an important unifying theme in relation to the three pillars of sustainable development.

The influence of environmental, behavioural, social, cultural, economic, and political factors on health and human development has varied throughout history and continues to vary, making it difficult, if not impossible, to formulate a general theory about criteria required for successful outcomes, i.e. for continuing health gains indefinitely. While the basic determinants of health include genetic makeup, environmental exposures, social circumstances, behavioural patterns, and health care, there are multiple complex interactions at individual and population levels.

Genetic factors generally are more relevant at individual and family level than at the population level, but gene-environment interactions are responsible for much human diversity. Environmental determinants of health are too numerous and complex to describe and discuss in detail, nevertheless the wide range of possible exposures to pathogenic organisms and environmental pollutants, and the individual and population-level responses to these exposures, are well known.

One challenge is to find ways to ensure that the “prerequisites” for health (e.g. satisfying of basic needs, access to health services, to a clean and safe environment, healthy working conditions etc.) are sustained where they exist now, and established where they do not exist.

In the following section, we examine briefly the state of world health over the past decade, since Chapter 6 of Agenda 21 (“Protecting and Promoting Human Health”) came into effect. What have been the major achievements? What are the major gaps and constraints? What are the key challenges for the future? We then discuss in more detail important influencing factors such as poverty, the process of globalisation, and issues related to production and consumption processes, natural resource use and environmental degradation, in the ensuing sections.

For references and source material see especially:

- 1) Last, J. *Health and Sustainable Development – Definitions, Principles and Concepts* (draft working paper prepared as input for the WHO meeting on “Making Health Central to Sustainable Development”, Oslo, Norway 29 November – 1 December 2001).
- 2) McMichael, A.J. *Contribution to WHO Concept Paper: Health and Sustainable Development* (draft working paper prepared as input for the WHO meeting on “Making Health Central to Sustainable Development”, Oslo, Norway 29 November – 1 December 2001).

3 KEY HEALTH TRENDS: A SNAPSHOT

We are living through what is, historically, a major transition in the health of human populations. There have been broad gains in life expectancy over the past half-century, as well as during the past decade (see further below), and these gains are continuing in most regions. Fertility rates are now declining on a wide front, and there have been widespread gains in maternal mortality and infant and child survival in developing countries.

The gains in the health profile of human populations over the past two centuries have resulted primarily from broad-based changes in the social, dietary and material environment, shaped in part by improved sanitation and other deliberate public health interventions. Factors such as increased literacy, family spacing, improved nutrition and vector control, sanitation, vaccination and treatment of infectious diseases have all been key. In the following sections, we take a snapshot look at world health over the past decade, in relation to some of the key health issues and conditions highlighted in Chapter 6 of Agenda 21.

3.1 Achievements of the Past Decade

Looking back over the past decade, we see that average life expectancy has increased, infant and child mortality rates have declined, and the proportion of underweight and stunted children has decreased. In developing countries, the percentage of people with life expectancy at birth below 60 declined from 38 per cent to 19 per cent between 1990 and 1999. The proportion of people without access to improved water supply fell from 21 per cent to 18 per cent over the past decade. Many infectious diseases have receded, owing to improved sanitation, nutrition, drugs and vaccines.

Notable progress towards the eradication or elimination of various major infectious diseases has been made. For example, the annual incidence of polio has fallen from an estimated 350,000 cases in 1988 (the start of the Global Polio Eradication Initiative), to an estimated maximum of 20,000 in 1999. The number of polio-infected countries fell from 125 to 30 over that period; the remaining infected countries are concentrated in parts of sub-Saharan Africa and the Indian subcontinent — particularly in areas with low routine immunization coverage, poor sanitation or where conflict is prevalent. A marked acceleration of activities has been undertaken to meet the goal of global eradication of polio by 2005.

Success in the form of a 90 per cent (or higher) reduction in cases of guinea worm over the past decade was achieved owing to a strategy based on health education, case containment and provision of safe drinking water. In West Africa, onchocerciasis (river blindness) has been virtually eliminated in 11 countries through a programme relying on vector control and community-based drug treatment, freeing millions of people from infection by the disease and releasing millions of hectares of riverine land for resettlement and cultivation.

These examples highlight the successes that can be achieved using **integrated strategies** based on education, environmental control measures and medical intervention measures, be they curative treatments, or personal preventive measures like immunization. Indeed immunization coverage for diphtheria, pertussis and tetanus (DPT), tuberculosis, measles and polio is currently 80 per cent or more in a majority of countries, as compared to approximately 30 per cent 20 years ago.

3.2 Gaps and Constraints

Despite undoubted health advances in many areas, poor health continues to be a constraint on development efforts. In some cases the process of development itself is creating conditions where, as a result of economic, political and social upheaval, environmental degradation, and uneven development or increasing inequities, human health suffers. The facts below are illustrative.

LIFE EXPECTANCY AND CHILD MORTALITY

More than 200 million people live today in countries with an average life expectancy of less than 45 years. Average life expectancy at birth in 1999 was 49.2 years in the least developed countries, compared to 61.4 for all developing countries and 75.2 for developed countries. In many sub-Saharan African countries, life expectancy fell during the 1990s owing to the impact of HIV/AIDS. Other major setbacks in health gains occurred in Eastern Europe and the former Soviet Union, where the political and economic transition has been accompanied by decreases in life expectancy of five years for males.

In some of the poorest countries of the world, one in five children still fails to reach his or her fifth birthday, mainly owing to infectious diseases related to the environment. The child mortality rate in the least developed countries in 1999 was 156 per 1,000 live births, compared to 81 in all developing countries and 11 in developed countries.

REPRODUCTIVE HEALTH

More than 20 million women continue to experience ill-health each year as a result of pregnancy. The lives of 8 million of those women are threatened by serious health problems, and about 500,000 women, almost 90 per cent of whom are in Africa and Asia, die as a result of causes related to pregnancy and childbirth. Around 17 per cent of potentially healthy years of life are lost in women of reproductive age because of sexually transmitted diseases, including HIV/AIDS. Factors that hamper progress include inequalities in access to information and to health services, prevalence of high-risk sexual behaviour, and the low social status of women.

INFECTIOUS AND PARASITIC DISEASES

Infectious and parasitic diseases (communicable diseases) account for 14 million deaths per year, around 25 per cent of the world total. They are the world's leading killers of children and young adults, including many breadwinners and parents. These diseases, which have intimate links to environmental conditions and poverty, affect the lives of poor people disproportionately and pose a serious threat to health and economic development.

Six major diseases currently cause 90 per cent of the deaths from communicable diseases: AIDS, malaria, tuberculosis, pneumonia, diarrhoeal diseases, and measles. In addition, several parasitic conditions continue to cause considerable morbidity and disability: schistosomiasis (over 200 million people infected), lymphatic filariasis (120 million people

affected), trachoma (over 150 million infected), trypanosomiasis, or sleeping sickness (over 55 million people threatened), and Chagas disease (up to 18 million people infected in Latin America).

HIV/AIDS

HIV/AIDS has reversed the rising life expectancies of the 1990s (sometimes to pre-1980 levels) in some countries. It is the fastest growing health threat to development today and a potential risk to security. About 36 million adults and children are now living with HIV/AIDS, 95 per cent of them in developing countries. In sub-Saharan Africa, over 25 million people are infected with HIV/AIDS. More than 12 million Africans have died of AIDS (over 2 million in a single year), and many millions have been orphaned, due to HIV/AIDS.

High (or rising) HIV infection rates are also occurring in many other parts of the world. For example, in Asia, where more than 6 million people are living with HIV/AIDS, there is the potential for an explosive epidemic. Factors driving the global epidemic are complex but include gender inequality, high-risk sexual behaviour, unsafe blood supplies, drug injection and other factors. Strengthened multisectoral responses and the implementation within health systems of better targeted, low-cost prevention and care strategies are among the numerous interventions being developed worldwide at all levels.

MALARIA

Several hundred million people continue to be infected annually with malaria, which results in almost 300 million clinical cases worldwide each year, and over 1 million deaths. The scale of the problem is increasing in many countries, partly because of deterioration in public health infrastructure, climatic and environmental changes, conflict-related human migration, widespread poverty and the emergence of drug-resistant parasites. Malaria has slowed economic growth in endemic countries in Africa by up to 1.3 per cent per year.

TUBERCULOSIS

Despite considerable progress in tuberculosis control in the 1990s, about 8 million people develop active tuberculosis every year, and the disease kills over 1.5 million people per year. In many cases, countries with the highest burdens have, for political or socio-economic reasons, been slow to adopt or expand control strategies, such as those advocated by the Global Partnership to Stop TB. Control efforts are also hampered by the emergence of HIV/AIDS and drug resistance.

ACUTE RESPIRATORY INFECTIONS

More than 4 million people die each year from acute respiratory infections, which are the top killers of children under five years and which accounted in 1999 for 7.2 per cent of total deaths at all ages. Pneumonia, the deadliest of such diseases, kills more children than any other infectious disease, with 99 per cent of those deaths occurring in developing countries. Many deaths could be prevented by the use of low-cost antibiotics and improved access to primary health care. Associated risk factors include low birthweight, malnutrition, crowding, and indoor air pollution due to cooking and heating with dirty biomass fuels and coal. Two billion people or more in developing countries, mostly women and girls, are exposed to

indoor air pollution due to lack of access to modern energy carriers, resulting in over 1.5 million excess deaths each year.

DIARRHOEAL DISEASE

Today, more than 1 billion people are without access to improved water supply, and 2.4 billion lack access to improved sanitation. Diarrhoeal diseases, largely preventable through access to safe drinking water, sanitation and food hygiene, claim 1.5 million lives a year among children under five years and account for several billion diarrhoeal episodes each year. Many of those deaths could be avoided by the use of simple and cheap oral rehydration salts. Cholera is a recurring problem in many areas and has become endemic in others. Exemplifying this trend, the number of reported cases worldwide nearly doubled in 1998, as compared to 1997.

VACCINE-PREVENTABLE DISEASES

More than 2 million children under five continue to die each year from diseases that can be prevented by currently available vaccines; approximately 800,000 of those deaths are from measles alone. Neonatal tetanus has been eliminated in over 100 countries; nevertheless it continues to kill almost 300,000 newborns and 40,000 mothers each year. Almost 30 million children of the 130 million born every year lack access to routine immunization services. Where mass vaccination efforts have been successful — for example, in the Americas — over 90 per cent of children are now immunized.

NUTRITION

Nearly 30 per cent of the world's population suffer from one or more of the multiple forms of malnutrition. Deficiencies of iodine, vitamin-A, iron and folic acid remain important and preventable contributors to morbidity and mortality. Almost 50 per cent of the 10 million deaths among children under five each year in the developing world are associated with underweight malnutrition. At the same time, obesity is becoming an increasingly important risk factor globally in adolescents and adults.

NON-COMMUNICABLE DISEASES AND INJURIES

In 1999, non-communicable diseases were estimated to have contributed to almost 60 per cent of deaths (33.5 million) in the world, (cardiovascular disease 30.3 per cent, cancer 12.6 per cent, respiratory diseases 6.4 per cent), and 43 per cent of the global disease burden. Non-communicable diseases and injuries are strongly associated with the aggressive marketing of unhealthy diets, tobacco and alcohol and with reduced physical activity.

TOBACCO

Tobacco remains a major preventable cause of premature death and disease. One in two smokers dies prematurely as a result of the habit. In 1999, there were over 1.25 billion smokers in the world, representing one third of the world's population aged 15 and over, the vast majority of whom are in developing countries. Four million people died in 2000 from over 25 tobacco-related causes of death, including several cancers and heart and respiratory diseases. A survey conducted in 12 countries throughout the world found that 10-33 per cent of 13-15

year-olds in those countries use tobacco. This portends a lifetime of addiction and premature death for many.

INJURIES AND VIOLENCE

Injuries and violence (including domestic violence against women and children) are major neglected public health problems and lead to more than 5 million deaths a year. Injuries currently represent 14 per cent of the global burden of disease. Many injuries also result in lifelong disabilities, affecting up to 10 per cent of the population. Road traffic injuries in particular, are an important cause of unintentional injuries in developed and developing countries alike. In all countries, the use of seatbelts, better alcohol control and general road traffic safety would considerably reduce mortality and morbidity. Three of the ten leading causes of death for 15-44 year-olds in developing countries are injury-related: road traffic injuries, interpersonal violence, and suicide. Three million adolescents between the ages of 10 and 25 lose their lives each year, mostly to traffic injuries, suicide and homicide.

WORKER'S HEALTH

Over 1 million workers die each year because of work-related diseases and injuries, and about 250 million accidents and 160 million cases of work-related diseases occur globally each year. The burden is heavier on workers (including children) in the informal sector, which is the largest and least protected sector. The economic costs of occupational injury, diseases and death have been estimated at 4 per cent of global GNP.

MENTAL DISORDERS

Mental and neurological disorders affect 400 million people. 30 per cent of countries do not have access to the basic drugs needed to treat such conditions as schizophrenia, depression and epilepsy.

3.3 Key Future Challenges

POVERTY

At the dawn of the new millennium, poverty is likely to remain the number one killer worldwide. Poverty is an important reason that babies are not vaccinated, clean water and sanitation are not provided, drugs and other treatments are unavailable, and mothers die in childbirth. A disproportionate burden of disease will continue to be borne by disadvantaged or marginalized women, including those living in environmentally degraded or ecologically vulnerable areas, in zones of conflict or violence, or compelled to migrate for economic or other reasons. The feminisation of poverty is a major threat to sustainable development.

URBANIZATION

Many health problems will continue to be exacerbated by pollution, noise, crowding, inadequate water and sanitation, improper waste disposal, chemical contamination, poisonings and physical hazards associated with the growth of densely populated cities. Badly managed urban settlements and overcrowded housing make it easier for infectious diseases to spread

and for illicit drugs and violence to take hold. Urban growth has outstripped the capacity of many municipal and local governments to provide even basic health and other services. Urban growth also means greater dependence on transport systems, which, if automobile-based, generate further pollution and risk of injuries. Air pollution, both ambient and indoor, including the work environment, will continue to be a major contributor to respiratory and other ill-health conditions and of particular concern to the health of children (asthma and acute respiratory infections, for example), women and the elderly (chronic respiratory illness). Already more than 1 billion people in urban areas are exposed to health-threatening levels of air pollution, and the figure is expected to increase.

GLOBALIZATION

Today, the prospects for future health depend to an increasing - but as yet uncertain - extent on the processes of globalisation and on the emergence of global environmental changes occurring in response to the great weight of humankind's economic activity. The globalization of trade, travel and culture is likely to have both positive and negative impacts on health. Increased trade in services and products harmful to health and the environment, travel and mass migration of people constitute additional global threats to health. Communicable diseases (such as tuberculosis), for example, are increasingly spreading to developed nations, where they affect the most vulnerable and poorest people.

The Example of Food Safety

With increasing globalisation, there is rising concern about food safety, related both to chemical substances and microorganisms. In many parts of the world, an increase in the incidence of food-borne disease has been evident over the past decade. In addition, the direct and indirect health consequences of the application of biotechnology in food production is a matter of concern, notwithstanding its dramatic potential to boost food production. While the growing trade in food promises health and nutrition benefits, it could also contribute to an increased dissemination of food-borne disease. Data from the United States of America and Europe indicate that specific interventions directed at particular microorganisms, such as salmonella, can reduce the incidence of food-borne disease. Work is underway to improve global surveillance, monitoring and risk assessment methodologies.

GLOBAL ENVIRONMENTAL CHANGE

Global environmental threats to health include climate change, depletion of the ozone layer, reduction of biodiversity, degradation of ecosystems and the spread of persistent organic pollutants. The long-term health consequences of human-induced climate change are likely to be profound and include threats to the food supply, natural disasters, infectious diseases, sea-level rise, changes in precipitation patterns and increased frequencies of extreme climate events, which may impinge particularly upon some of the least developed countries. Planning for the protection of human health from the potential impacts of global environmental

threats requires a much improved understanding of the disease-inducing mechanisms involved and of the vulnerability of populations.

DISASTERS

Disasters, both human-induced and natural, offset years of development and are foremost causes of poverty and renewed vulnerability. Currently around 250,000 people are killed every year as a result of natural disasters, with about 95 per cent of the deaths occurring in developing countries, reflecting the differences in disaster mitigation and preparedness levels between developed and developing countries. Population displacement, increases in populations living in vulnerable areas, transportation of toxic and hazardous materials, rapid industrialisation, water and food scarcity, and chronic conflict increasingly lead to complex humanitarian emergencies, including the collapse of public health services. The International Strategy for Disaster Reduction provides an important framework for international efforts aimed at disaster prevention and mitigation.

3.4 The Health Transition

As traditional infectious diseases recede, the incidence of chronic non-communicable diseases (NCDs) of mid and later adulthood is rising worldwide. The steep projected global increase in the burden of non-communicable diseases represents one of the major challenges to future health development. Non-communicable diseases, injuries and violence will account for nearly 80 per cent of the global burden of disease in 2020. By then, the leading causes of disability are likely to be heart disease, depression and road traffic injuries. By 2030, at current projections, tobacco will kill more than 10 million people annually, with 70 per cent of the deaths occurring in developing countries and about half in productive middle age. The number of women smokers is expected to triple over the next generation.

Part of the increase in NCDs relates to the ageing of the population. The number of people over the age of 65 is likely to reach 10 per cent of the global population by 2025, and increases of up to 300 per cent in the older population are expected in some developing countries. The portion of the global disease burden attributable to mental and neurological disorders and substance abuse is expected to rise significantly. Health systems will need to be reoriented to deal with chronic diseases requiring long-term care, which endanger the financial sustainability of health care systems in general.

Chronic diseases such as cancers, heart and lung diseases take years to manifest. They arise typically in populations over the age of 40 years and after individuals and populations have been exposed to, or have consumed harmful products for, many, many years. By the time the diseases become common in populations, the *preventive* potential has been lost and demands for treatment often permanently skew resource allocation to these problems.

CHANGING PATTERNS OF NUTRITION AND MOBILITY

At a time when there are many hundreds of millions of people who are undernourished, there are increasing numbers who are obese. While the majority of those who are underweight live in rural areas on marginal lands; almost all of those who are obese live in cities: often side by side in the same households as those who are undernourished. Urban poverty is thus common to all forms of malnutrition. Obesity predisposes people to heart disease, diabetes, certain cancers and hypertension. While dietary causes are important, physical activity levels are also crucial. These are declining worldwide.

These key challenges are, and will continue to be, among the major influences upon human health and well-being in the foreseeable future. The responses to these challenges include development choices – the development policies and economic strategies pursued at international, regional, national and local levels. These define the paths to economic development which are followed and the production and consumption processes which are employed. In the next section, we consider in more detail the issue of poverty, and highlight some of the linkages with health.

For source material see especially:

von Schirnding, Y. and Mulholland, C. *Health and Sustainable Development: Key Health Trends*. Thematic review of Chapter 6, Agenda 21. Prepared by WHO as input to the report of the UN Secretary-General (Prepcom 1, CSD 10; 30 April-2 May 2001).

4 HEALTH AND POVERTY

The link between poverty and ill-health has been well documented. Poverty is the predominant underlying cause of ill-health, expressing itself through a multiplicity of pathways, resulting in a huge burden of disease in poorer countries (and a disproportionate burden among the poor elsewhere). The absence of sustainable systems in every sector of socio-economic life (including the health sector) ultimately undermines health. Poor health in turn impedes sustainable development of countries and communities, the causes of which also occur through a multiplicity of pathways.

This section outlines these well-established links and recognises the added burden carried by the most vulnerable in society. It then asks the obvious questions – if the links have been evident, what efforts have been made to “sustainably” improve health and why have many of these had limited success? Why is success so often short-lived? What are the weaknesses and how should they be tackled? There have been important successes in the development of national health systems and in tackling some major burdens of disease. There are invaluable lessons to be drawn from these.

4.1 Multidimensional Poverty and Vulnerable Groups

Poverty in this context is understood, not solely as income poverty, but the multidimensional poverty which results also from inequities and discrimination, and which results in vulnerability. Poverty, regardless of whether it is due to lack of knowledge and information, low income levels, lack of access to basic services or poor environments, is reflected in poor health status. This is particularly the case when we look at vulnerable groups. Vulnerability varies according to the level of development and the health transition stage of countries at any given time. While each society has its typical patterns of ill-health, within these general patterns, certain population groups and sections of society are more exposed to health hazards, have lower chances for survival, and a poorer quality of life. These are the most vulnerable groups in all societies and include women, children, adolescents, older persons, displaced persons and refugees, migrants, minority groups and indigenous people.

Children provide a poignant illustration of the health outcomes of vulnerability. As we have seen in the previous section, hundreds of millions of children in the developing world fail to reach their first birthday each year. They generally die of simple, easily treatable diseases, such as diarrhoea, pneumonia, malaria and of diseases preventable by immunisation. As indicated earlier, many of these diseases have their roots in ecological conditions and factors such as inadequate water and sanitation, nutrition, etc. The chances of neonatal death and mothers dying in relation to childbirth, both sensitive indicators of overall health service performance, are respectively tens and hundreds of times greater in poorer countries than amongst the affluent.

The obvious focus, in the face of resource limitations, on younger children, with their heavier burden of communicable disease, and of environmentally-related ill-health conditions, has often meant that the vulnerability of adolescents, such as their adoption of lifelong harmful health practices (for example smoking, substance abuse, unsafe sex) at this impressionable

age is not afforded sufficient attention. Women, carrying the triple burden of child rearing, income generation and home management, often worsened by conditions of broader discrimination, carry a higher burden of disease. The vulnerability and health burden in the aged (chronic disease), disabled and mentally ill is missed if only mortality data is used to make the analysis. Some of these inequities are particularly prevalent at the level of the household. The box below illustrates this with respect to environmental conditions at household level.

Vulnerable Groups in the Household Environment

The health of poor children in particular is affected by adverse environmental conditions at the household and neighbourhood level. Not only are they more exposed to health threats in the environment, they are also more vulnerable to the ill-health effects stemming from problems such as a lack of clean air and water.

In the USA and parts of Europe, lead poisoning illustrates the unequal burden of risk borne among poor inner city children, who are not only more exposed to sources of lead in and around the home environment, but who also are more affected by the toxicity of lead. For example in the USA, around 16% of children aged 1 to 5 years from low-income families have raised blood lead levels (above 10 ug/dl), compared to only 4% among children from high-income families - a four-fold difference.

Studies from South Africa also demonstrate dramatic socio-economic differentials with respect to blood lead burdens in inner city children. These are associated with such factors as poor housing and deteriorating lead-based paint, contaminated air and dust, pronounced hand-to-mouth activities and poor supervision of children, coupled with nutritional deficiencies.

Women are also vulnerable to a wide range of hazards. They typically spend more time in and around the home than working age men, because they carry a disproportionately high responsibility for household chores, particularly cooking, and often also have their economic activities located within the home area. The problem of indoor air pollution from biomass burning illustrates the increased vulnerability of both women and children at the household level. Evidence is accumulating that ill-health effects such as respiratory illnesses may be strongly associated with high indoor pollution levels.

Hence, women have a high stake in the home and neighbourhood environments, partly because they and their children are more directly affected, but also because of the work burden implicated for women in caring for the sick, cooking and maintaining cleanliness in the home.

(Adapted from von Schirnding 2001, McGranahan 2001)

But vulnerability is not simply a matter of age groups. Whole communities are often marginalised and excluded from the opportunities for sustainable development and health – be it in rural areas or the urban fringes, in ecologically degraded areas, be it amongst minority groups or in the face of direct discrimination, or environmental refugees or those displaced by war or conflict. Their ill-health burden is diverse and their poverty multidimensional – there are

health consequences of social exclusion, poorer services and lack of opportunities for development and empowerment. It may even be linked to bad government, including corruption, which may also block international support and investment.

4.2 Impacts of Poverty on Health

How does poverty lead to ill-health? Improved health is not just a product of health service interventions, it is a consequence of many complementary factors which are woven into every facet of life. A few examples of this link are:

Poverty and ill-health

- Economic underdevelopment, including through reduced production and raw goods prices, and protective trade and market practices, damage health through a number of paths, including unemployment and low incomes. Countries cannot ensure basic services for their citizens and individuals are unable to purchase the necessities of health. Long work hours and poor working conditions are among the many stresses that undermine the health of workers in poor countries.
- Shortfalls in agricultural production and lack of land reform have a direct effect on food security and hence on malnutrition. Malnutrition directly causes illness and vulnerability to infection.
- Lack of education, and in particular women's education, limits the ability of the poor to identify and take appropriate actions to improve their own health and indeed to secure their basic needs.
- The oppressed position of women in poverty leads to poorer health in many ways, including a weak position in ensuring safer sex practices.
- People living in low-income settlements with poor infrastructure are exposed to the health problems of social instability and communicable disease, as well as to environmental hazards and NCDs (see box on the range of environmental health problems in low-income settlements).
- Some billions of people live without access to safe water or sanitation, exposing them to water borne and water washed diseases.
- Lack of general infrastructure, such as good roads and transport not only impede health services, but add to fatalities from accidents.
- The digital divide not only entrenches poverty by holding back development, but also impedes the chances of care in an emergency.
- Governance and institutional weaknesses, although not uniform, influence health both indirectly and directly. Governments are faced with an array of pressures and health and health services are not necessarily afforded the priority required; nor is what is available necessarily equitably distributed or efficiently managed. The effectiveness of public and infrastructure services, the basis for development and for encouraging investment may

also be weak. This quality of governance impacts on economies and through this, on health.

- Besides directly causing death, war and conflict have had catastrophic effects on health, disease control and disability. Not only are health services prone to collapse, resources are diverted away from health-promoting actions and poverty becomes more pervasive as the health impact extends beyond the war zone. Displaced people become victims of the health impacts of even more acute poverty.

(Adapted from Buch 2001)

The importance of the influence of these factors on health is being recognised ever more acutely in international fora and by international organisations, and are now an important feature in poverty reduction strategies. Below, we highlight how the physical environment may impact on the health of the poor.

Environment and Health in Low-income Settlements

While those living in poverty suffer overall from poor health status, the share of the burden of disease arising from (physical) environmental hazards is greater in low income settings. It is not surprising that poor groups suffer most from the ill-health, injury and premature death caused by environmental hazards. Individuals and households without adequate incomes are less able to afford accommodation that protects them from environmental risks – that is, good quality housing in neighbourhoods with piped water and adequate provision for sanitation, garbage collection and drains.

In their struggle to secure a livelihood, they are liable to undertake work that exposes them (and often their families) to environmental hazards. They have the least resources to cope with illness or injury when they occur. And they generally have the least political power to demand that these problems be addressed.

The range and severity of the environment, health and development problems in many low-income settlements often go unrecognised, however:

- Their houses and neighbourhoods are the worst served with water, sanitation, garbage collection, paved roads and drains, and their residents can least afford clean fuels, ventilation, adequate living space and hygiene facilities. This can be seen in the scale of the differentials between wealthy and poor areas in environmental hazards, in access to public services and in health indicators. Infant or child mortality rates in poorer districts (even within the same city) are often many times those in richer districts.
- It is generally poorer groups who live in the locations where the ambient pollution levels and environmental risks are highest. There is also the tendency for polluting industries, waste dumps and waste management facilities to concentrate in the vicinity of low-income neighbourhoods, often not planned for residential settlement, and with less basis for effective political resistance.

- Low-wage jobs often expose workers to a range of environmental hazards that threaten their health and well-being. Thus street vendors are exposed to high levels of vehicular pollution, waste pickers are exposed to hazardous materials, and cramped and crowded working conditions can create a wide range of environmental risks.

Bad sanitation may lead to contaminated groundwater and faeces finding their way into the solid waste, onto the open land, into the drainage ditches, and generally into contact with people. Flies may breed in the human and other waste, and contaminate the food. Solid waste may find its way into the drains, causing accumulations of water in which mosquitoes breed. Microbial food contamination makes thorough cooking important, but cooking with smoky fuels may expose women and children to hazardous pollutants. The mosquito coils and pesticides used to combat mosquitoes may add to the air pollution and chemical hazards. Crowding and poor housing can exacerbate most of these problems.

In low-income settlements therefore, local environmental problems are a major cause of disease and death. Inadequate household water and sanitation, smoky cooking fuels, waste accumulation in the neighbourhood, disease-carrying pests – all are major contributors to ill-health and mortality, especially among children, and all involve closely inter-related local environmental processes. Virtually everyone living, working and socialising in the neighbourhood is at risk, but particularly women and children. Low-income settlements may also come to be the worst affected by global environmental damage, but they have immediate concerns that are, and ought to be, the priority for local action.

(Adapted from McGranahan 2001)

4.3 Ill-Health and Development

The links between health, poverty reduction and long-term economic growth are powerful - much stronger than is generally understood. The burden of disease in some low-income regions, especially sub-Saharan Africa, stands as a stark barrier to economic growth and therefore must be addressed as a central component of any comprehensive development strategy. Malaria alone is estimated to slow economic growth in Africa by up to 1.3 per cent each year. Africa's GDP would probably be about US \$100 billion higher if malaria had been tackled 30 years ago, when effective control measures first became available. Even today, half a billion cases of malaria each year lead to the loss of several billion days of productive work.

The HIV/AIDS pandemic represents a unique challenge of unprecedented urgency and intensity. This single epidemic has the potential to undermine Africa's entire development process over the next generation. HIV/AIDS is estimated to slow economic growth in Africa by up to 2.6% in high prevalence countries. Through its widespread impact on demography, households, communities, sectors and the economy, HIV/AIDS is now seen as more than a health crisis; it is recognised as a threat to development and security throughout the world.

(Adapted from Buch 2001)

If one adds the consequences of the high burden of other preventable diseases and lack of effective care, the result grows to “dozens of percent of GNP in poor countries, which translates into hundreds of billions of dollars.” The thought of what an annual investment of hundreds of billions of dollars would have on life in poorer countries succinctly illustrates that investments in health and health care are productive and not simply consumptive as some are prone to think – with more than tangible returns.

In addition to causing much premature death and chronic debility, many of the diseases that are so burdensome indirectly harm environments or impede their development by weakening the workforce available to manage and improve agricultural ecosystems. This in turn impairs food production, can threaten food security, and contributes to the infection-malnutrition syndrome that aggravates the impact of many infections of infants and children. Several vicious cycles are thereby perpetuated. Rural subsistence agriculture in Sub-Saharan Africa has been very hard hit by this combination, which includes an especially high prevalence of HIV/AIDS as well as malaria, diarrhoeal diseases, and parasitic infections such as schistosomiasis.

As with the multiple routes through which poverty leads to ill-health, so are there multiple ways in which good health enhances development. This includes survival of trained labour, higher productivity among healthier workers, higher rates of savings and investment, greater enterprise and agrarian productivity and increased direct foreign investment and tourism. Children’s educational attainment is higher, which ultimately enhances productivity, lowers rates of fertility and changes the dependency ratio.

Improved health also has benefits at reducing poverty at the family level. Most visible is a catastrophic illness or injury in the absence of an effective public health service or pre-payment system can lead to a debt trap that impoverishes families for years, driving ill-health in the entire family through mechanisms such as malnutrition. This in turns undermines the potential of families for development.

4.4 Poverty and Health Service Impact

Effective health services (both personal as well as non-personal - concerned inter-alia with health promotion, environmental and occupational health) have the potential to impact dramatically on health. However, poor countries are generally unable to secure or sustain their health services at the level required to make the desired impact. Besides struggling to mount disease control programmes that match the scale of HIV/AIDS, malaria and other communicable disease challenges, the inadequate numbers of capable health workers (doctors, nurses, sanitarians and others), unaffordable essential drugs and supplies (and lack of drugs and vaccines relevant to the needs of the developing world) and poor support and referral systems block necessary care.

The reality for many of the world’s poor is that there is no accessible service, and when they do reach a health service, the health worker may not be capable of accurately diagnosing or treating their condition, or there may be inadequate preventive services available. Essential drugs and supplies required for their care are commonly not available. They may also be unable to effect referrals to hospital in emergencies, such as for a women in obstructed

labour. Adherence to therapy for chronic diseases, such as tuberculosis, is particularly difficult in a weak health system, rendering treatment ineffective and leading to drug resistance.

It is in this context that the lack of consistent care for non-communicable diseases, such as diabetes and asthma, add to the death toll, while uncontrolled epilepsy and untreated mental health problems add to morbidity. The effect of the health transition (see Section 3), often driven by lifestyle changes imposed on the poor, albeit hidden beneath the burden of communicable disease, should not be underestimated. Disease prevention and health promotion measures, such as immunization and contraception, and environmental control measures, are also impeded by ineffective health systems.

Of course, when peace prevails, health services need to be rapidly scaled up. This is not only because of the burden of treatable disease that is likely to have built up, but because it is an effective way of starting the reconstruction of communities and societies and building their confidence in post-conflict government.

In the face of many challenges, available health services are not equitably accessible to all. Services in rural areas and urban fringes are inevitably weaker. The so-called inverse care law applies all too commonly: There are fewer services where the need (and potential impact) is greatest and the services that are provided are weaker. The challenge of delivering regular supplies and ensuring suitably skilled workers taxes many rural systems. In addition, there are many social as well as economic barriers to access for the poor - even small fees become a barrier.

4.5 Unequal Burden of Ill-health

Poverty leads to poor health services and both lead to poor health, while poor health undermines development. But, the burden of ill-health is not equal for all; nor are all health services equitable, or economic development equally beneficial. Some development may indeed be detrimental to health. It is in this context that the link to sustainability becomes most visible.

What is the best form of development that matches sustainable economic growth with lifting the overall well being of communities and their health, rather than the accruing benefits for a selective few? This is at the heart of some of the debate about the impact of globalisation on development and health, which we discuss in the next section. Whatever position one takes in these debates, the basic message is clear: There is no doubt that equitable development that provides sustainable incomes and access to services for the poorest, will have the greatest impact on health, which will in turn churn development.

An analysis of the link between poverty and health must inevitably focus on the poorest countries and people. However, it must be recognised that there are hundreds of millions of vulnerable people suffering a heavy burden of disease in middle-income countries, for reasons not dissimilar to those in the poorest countries. That sustainability is also undermined by the overconsumption in affluent countries is also clear. Indeed, as indicated in Section 2, all components of sustainable development need to be addressed as part of an interdependent whole. We illustrate this below, with respect to the environmental transition.

The Environmental Transition

It is often claimed that poverty causes environmental degradation. Perhaps more often, it is claimed that affluence causes environmental degradation. Many specialists have claimed that environmental problems first increase and then decline with economic growth (i.e. the environmental Kuznets curve).

For example studies have found that household sanitary conditions tend to improve with wealth, that urban concentrations of various outdoor air pollutants increase and then fall, and that contributions to carbon emissions subsequently increase. These relationships reflect an environmental transition that helps to explain some of the health differences commonly observed between countries.

In general, with increasing affluence environmental burdens tend to become more diffuse, delayed and indirect. The overall outcome is that the environmental burdens of poverty tend to fall on the poor themselves, while the environmental burdens of affluence fall on a far more temporally and spatially dispersed 'public'. This in turn contributes to the fact that a far higher share of the burden of disease in low income countries is due to environmental factors.

Thus in affluent human settlements, the most serious local environmental hazards have been displaced or reduced, while existing lifestyles pose major, if often uncertain, delayed and diffuse threats to human life support systems. Waste, once a problem primarily in and around people's homes and workplaces, now interferes with a range of regional and even global processes. Global sustainability is challenged by high levels of materials and energy consumption and waste generation, selective pressures on distant ecosystems, and new hazards arising from technologies developed to meet the demands of the affluent.

Between these two extremes are a range of urban and regional problems that tend to be most severe in and around large, industrialising cities, which are typically located in middle-income countries. Pollution of ambient urban air and waterways are typical examples. They reflect increasing levels of polluting activities, involving especially industries, transport and energy conversion, along with the displacement of sewerage and waste burdens from the neighbourhood to the wider environment. Many of these burdens affect people's health directly, but most also have ecological consequences with more indirect impacts.

Indeed, often it is difficult to distinguish traditional risks from new and emerging risks associated with industrialisation. For example pesticides and faeces may contaminate the same water supplies. Air pollution may stem simultaneously from burning dirty household fuels and industrial use of fossil fuels. Developing countries have thus to deal simultaneously with problems related to poverty and a lack of basic services, as well as with the impact on health of large scale and rapid industrialisation, urbanisation and technological development. From a sustainable development perspective, all of these aspects need to be addressed if the needs of the present generation are to be addressed without compromising those of the future.

(Adapted from McGranahan 2001)

For references and source material see especially:

1) Buch, E. *Poverty and Health in the Context of Sustainable Development* (draft working paper prepared as input for the WHO meeting on “Making Health Central to Sustainable Development”, Oslo, Norway, 29 November – 1 December 2001).

2) McGranahan, G. *Environment, Health and the Pursuit of Sustainable Development in Human Settlements* (draft working paper prepared as input for the WHO meeting on “Making Health Central to Sustainable Development”, Oslo, Norway, 29 November – 1 December 2001).

5 GLOBALIZATION AND HEALTH

This section reviews how the recent era of globalization affects human health. It cannot detail all of the arguments, or cite all of the data or analyses, that plot the complex relationships between globalization, trade and health. Indeed, it poses as many questions as it partially answers. The pro-globalization argument contends that trade liberalisation, de-regulation and privatisation will promote economic growth which, in turn, will reduce poverty and so enhance health.

There is however a lack of evidence that the recent era of liberalisation has lessened poverty, though much depends on what measures for both liberalisation and poverty one uses. As we have seen, economic growth, especially for poorer nations, may increase the depletion of natural resources and emission of industrial toxics and greenhouse gases, even assuming a largely “digital” or knowledge economy and use of best-available environmental technologies. Increased movement of goods requires fossil-fuel consumption. Even assuming that the fruits of economic globalization were shared equitably, there is legitimate concern that we would run out of planetary resources before the world’s poor became sufficiently wealthy to concern themselves with environmental preservation.

Economic wealth inevitably uses natural resources in its cycle of creation and consumption. With finite resources and the need to ensure their equitable distribution, there is heightened need for governance that regulates for ecological sustainability and social justice. The central issue in any examination of globalization and health is the erosion (or surrender) of national regulatory capacities to accomplish these ends within their own borders to a supranational trade and investment liberalisation regime, without any equivalent system of regulation at a global level.

5.1 Defining Globalization

There is little agreement about what precisely globalization means, except that it describes a process by which nations, businesses and people are becoming more connected and inter-dependent across the globe “through trade, finance, production and a dense web of international treaties and institutions”. Distinctions are sometimes made between three inter-relating forms of globalization:

- cultural/communicative
- environmental
- economic.

Cultural/communicative globalization refers to the rapid growth of communications technology and the internet, and the impact of such technologies on social cultures. Such technologies can increase access to health information, and are already playing a major role in strengthening civil society participation in an emerging network of “global governance”. But there are three ways in which this facet of globalization negatively affects health:

- The extent to which such technologies or access to the knowledge (information) economy are available to all persons or nations on an equitable basis.

- The role of the new trade and investment regime in reducing or increasing existing inequalities in such access.
- The role this technology plays in aiding rapid flows of finance capital.

Environmental globalization describes how environmental incidents or impacts that happen in one region or country have the potential to affect the entire world, and all life in it. Atmospheric pollutants are transported over long distances and affect the health and resource bases of populations thousands of kilometres away. Some pollutants in the Arctic, such as DDT, PCBs and heavy metals (mercury) have been sourced from as far away as China, India and Guatemala.

Globalisation and trade has always played a role in disease, and in its prevention. For example trade transformed cholera in the 19th century from a rare disease restricted to a remote region of India to a global pandemic. The difference between environmental globalization of past and current eras, and its subsequent effects on health through, inter alia, climate change or resource depletion, is one of scale.

Economic globalization underpins the other two forms and describes the integration of economic activities that were once more national or regional in scale to planet-wide functioning. Again, this is not a wholly new phenomenon. Economic globalization has been a characteristic of capitalist economic expansion for at least a century or longer. Trade and capital flows between countries are only beginning to assume the same economic proportions they had a century ago before recessions, depressions and world wars ushered in a long era of protectionism.

Some analysts conclude that there is nothing inevitable about economic globalization. An era of liberalisation can as easily lead to one of renewed protectionism. But other analysts maintain that the speed and scope of trade and investment transactions today is quantitatively and qualitatively different than in previous eras, leading to a progressive loss in national control over economic policy variables. Some extend this concern to the new regime of trade and investment liberalisation agreements, with its expansion into trade-related areas of services and intellectual property rights (GATS, or the General Agreement on Trade in Services; and TRIPS, or the Agreement on Trade-Related Aspects of Intellectual Property Rights). Such agreements may weaken the control of national and sub-national governments over domestic social and environmental policy, the very policy instruments required to ensure that market-driven gains are both equitably distributed and ecologically sustainable.

5.2 A Simple Model for Assessing Pathways Linking Globalization and Health

It is difficult to link directly health outcomes to globalization processes. Other phenomena may affect health status dramatically in the short-term (e.g. infectious diseases such as HIV/AIDS, or large-scale immunization programs) largely independent of globalization processes. Changes in physical environmental conditions, such as increasing the size of a nation's or population group's "ecological footprint" may improve health outcomes in the short-term, but not over the longer-term. Changes in international trade and investment flows

are recent, and present-day health outcomes, at least for older populations, may reflect social and environmental conditions of an earlier period characterised by greater trade protectionism and strong state welfare programs.

Perhaps most importantly, globalization may improve peoples' health in some circumstances but damage it in others, especially when liberalisation has been rapid and without government support to liberalisation-affected sectors and populations. For example liberalised trade in agricultural products may provide short-term economic benefit to less developed countries. This can improve peoples' health, dependent on how equitably those benefits are allocated amongst all citizens. But food exports in poorer countries can also increase fossil-fuel based transportation, creating short and longer-term health- and environment-damaging effects, and commodity-led export produces lower long-term economic growth than manufactured ("value-added") export.

Protectionist policies, including subsidies, in turn, may preserve rural life and livelihoods, arguments frequently advanced by the European Union and Japan. This benefits the health and quality of life of rural people. But such policies can also support ecologically unsustainable forms of production and increase oligopolistic corporate control over global food production. Trade openness might also increase women's share of paid employment, which is an important element of gender empowerment. But, at the same time, public caring supports for young children have been declining in many trade-opened countries, portending future health inequalities; and much of women's employment remains low-paid, unhealthy and insecure. What is the gain? What is the loss?

It is not this paper's intent to answer these questions so much as to provide a simple framework for understanding how globalization might affect health. This section also includes a synopsis of some key trends and a discussion of how the new regime of trade agreements, in broad terms, might be amended to better ensure equity in health across populations and environmental sustainability across generations.

There are four broad categories for understanding better how economic globalization impacts on pathways to health. These are:

1. Regulations governing social and environmental health-determining conditions, in particular the legal constraints on national/sub-national regulatory powers imposed by various trade and investment agreements.
2. Social and environmental health-determining conditions themselves, such as economic growth, poverty, income distribution, physical environment, food access/security, employment, social capital/cohesion and gender equity.
3. Exposure to health damaging products, such as tobacco, toxic waste and/or products containing hazardous or potentially hazardous substances.
4. Access to health care and other health promoting public services, such as education and housing, through increased privatization and user fees, or reductions in service levels and access.

What do we currently know about globalisation's effects in each of these categories?

NATIONAL REGULATORY AND GOVERNANCE ISSUES

A major concern with global trade agreements is their potential weakening of the abilities of national and sub-national governments to regulate social and environmental conditions for human health and sustainability outcomes. Countries can adopt human investment and social transfer policies to cushion peoples' living standards against economic decline consequent to economic globalization. This, however, requires adequate and tax-funded compensatory policies and programs. Liberalisation is creating tax competition amongst countries. This is resulting in declines in tax revenues in rich and poor countries alike, with a subsequent erosion of public services.

Recent studies have examined the contribution of health (or education and other "pro-poor" capacity-building) public investments on longer-term economic growth, indicating some modest positive relationship. Multilateral agencies, including the World Bank, now also claim the importance of pro-poor economic development strategies. Such policies, however, often require forms of economic intervention (tariffs, performance requirements and other policy instruments) to direct internal economic development in ways that meet human development (including health development) goals. Yet the new regime of trade agreements works precisely to remove many of these capacities from national governments.

At the same time, the current globalization process is unevenly global in terms of trade and investment. Least developed countries, with 10% of the world's people, account for 0.3% of the world trade, only half of their share two decades ago when the push to global trade first began in earnest. Foreign investment, frequently cited as engine for growth, take place mostly between North America, Europe and Japan, which together, with China, receive more than 90% of foreign direct investments (FDI). The rest of the world, with 70% of population receives less than 10%.

HEALTH PROMOTING SOCIAL CONDITIONS

While causal links between globalization, liberalisation and health are still being researched and contested, there is little evidence to suggest that the past twenty years have significantly reduced global poverty rates. Some argue that trade openness leads to growth leads to poverty reduction (and hence, presumably, to improved health), while others challenge every link in the chain.

As well, there is only speculation (some positive, some negative) on how much diffusion might be affected by a potential slow-down in technology transfers associated with strengthened intellectual property rights agreements, such as TRIPS. The recent era of increased free trade and investment flows have seen a decrease in poverty at the <\$1/day level, hence the claim by many that global poverty is declining. But it has also seen an increase in poverty at the <\$2/day level, hence the counterclaim by many that poverty is increasing. Only a handful of countries (i.e. east Asia) have "grown" economically out of poverty. Many analysts believe this is due more to their inward initial development and protracted protectionism than to liberalisation per se, i.e. economies that do well with liberalisation are those already internally developed, rich and saturated.

Somewhat less disputed is the increase in income inequality within most nations, and between developed and developing nations, that occurred in the past two decades. What is sharply contentious is where (or if) a trade-off should be made between poverty reduction that also increases income inequality. That is, assuming economic growth may generally decrease poverty, it also appears to increase inequality. The former should lead to short-term health, but what are the longer-term risks of increased health inequalities associated with longer-term income inequalities? What is (or should be) the normative trade-off between increasing the base-line of wealth and health while also increasing the “gap” between top and bottom within and between nations? Given the growing literature on social capital/cohesion, and its pathways to health, what are effects of increasing income inequalities on social capital/cohesion?

HEALTH PROMOTING HEALTH AND HUMAN SERVICES

Developed countries generally do better than developing countries in ensuring their poor obtain access to health care. At the same time, the health gains from such care in developed countries is much more marginal than it is for the poor in poorer nations. Health care in poorer countries still tends to favour the wealthy over the poor and hospital care over primary care. Even in the case of programs intended for the poor (such as oral rehydration therapy) many initiatives fail to reach the poor and so widen health inequalities within the country. Nonetheless, public health spending in poorer countries (at the \$1/day or \$2/day poverty levels), regardless of the inequality of its distribution, is associated with improved health outcomes. Interestingly, education spending, particularly for women, is only associated with improved health outcomes at the \$2/day poverty level – the very level where poverty rates, globally, are increasing.

Access to health care, however, as emphasised earlier, is not the major driver of health status in developing countries. The greatest predictors continue to be income and education levels, and gender equity. Health service access, while still important, may be a driver more for what it represents in forgone income (particularly under conditions of increased privatisation or user fees) than in services per se.

TRADE IN HEALTH-DAMAGING PRODUCTS

Most research in this area has gone towards examining the effects of trade liberalisation on tobacco use. A recent study demonstrated that there was a significant rise in the market share of US cigarettes in those countries affected by particular sections of bilateral trade agreements which resulted in the removal of excise taxes and what were perceived to be discriminatory distribution practices. The study concluded that the agreements resulted in an overall increase in cigarette demand. A joint World Bank/WHO study demonstrated the same results more broadly, showing that the largest impact of reduced trade barriers with respect to tobacco consumption occurred in low income countries.

There is also concern over the growth in trade in hazardous waste, much of it illegal. Most of the world's toxic waste is generated in OECD countries. Stricter environmental regulations and higher costs for disposal in these countries are leading to a growing export market. Officially, only a small amount of toxic waste is exported to developing countries, but there is evidence of widespread unofficial movement.

There is a paucity of data tracking production and transport of hazardous waste. Some initial attempts to map changes in the flow of hazardous waste following NAFTA have been made, particularly to determine if nominal or regulatory commitments between trading nations for "cradle to grave" management have been compromised. The study concluded that, at present, it is difficult to ascertain potential environmental (much less human health) impacts since data on waste generation (particularly in Canada and Mexico) is limited, and for trans-boundary shipments is almost non-existent. Assessing any changes in the global trade in hazardous waste, and the effect of trade liberalisation on such movement, will require detailed, localized case studies.

In the next section, we consider in more detail issues related to production and consumption processes which are leading to resource depletion and environmental degradation, as well as to ill-health. We focus in the first instance on the global environment, and the destruction of global life-support systems (critical for ensuring the health and well-being of future generations), and draw attention also to the importance of the local environment (critical for ensuring the health of the current generation). We stress also the linkages between the local and the global, and their respective "green" and "brown" agendas, which need to be addressed as interdependent components of sustainability.

For references and source material see:

Labonte, R. *Health, Globalization and Sustainable Development* (draft working paper prepared as input for the WHO meeting on "Making Health Central to Sustainable Development", Oslo, Norway, 29 November – 1 December 2001).

6 | PRODUCTION AND CONSUMPTION PROCESSES, NATURAL RESOURCE USE AND ENVIRONMENTAL DEGRADATION

The planet is suffering many intractable problems. Natural resources are harmed by population pressure and industrialization. Ecologically essential wetlands are encroached upon by airport expansion, and urban and industrial sprawl. Coral reefs, sensitive to a tiny ocean temperature increase, are dying. Per capita grain production, which rose from the 1950s to the late 1980s, has levelled off and begun to decline. Some coastal and ocean fisheries, e.g. the North Atlantic cod fishery, have collapsed and many others are in jeopardy from over-fishing, pollution, and climate change (fish provide 20-25% of human protein intake). Over a billion people lack access to safe water supplies. For over half a billion the shortage is critical, often aggravated by mismanagement or prolonged drought that may be due to shifting climatic zones caused by global climate change. Where there is water it may be unsafe to drink because it is contaminated by excreta, toxic chemicals or both. In Bangladesh, deep wells intended to provide safe drinking water tapped instead into aquifers heavily laden with arsenic. Providing safe drinking water for all would cost about \$10 billion/year, a tenth as much as Europeans spend annually on alcohol. The gaps between rich and poor, healthy and unhealthy, continue to widen. Resource-poor regions remain burdened with debt and often with disease. These are some of the challenges we face on the road to WSSD 2002.

(Adapted from Last 2001)

6.1 Global Environmental Issues and Natural Resource Use

There are a number of changes taking place at the planetary level which reflect the increasing magnitude of human numbers and the intensity of modern consumer-driven economies. Humankind is now disrupting at a global level some of the biosphere's life-support systems, which provide environmental stabilisation, replenishment, organic production, the cleansing of water and air and the recycling of nutrient elements. Our predecessors could take these environmental "services" for granted in a less populated, lower-impact world.

However, today humankind is changing the gaseous composition of the lower and middle atmospheres; there is a net loss of productive soils on all continents, depletion of most ocean fisheries and many of the great aquifers upon which irrigated agriculture depends; and an unprecedented loss of overall rate whole species and many local populations. An estimated one-third of the world's stocks of natural ecological resources have been lost since 1970. These changes to Earth's basic life-supporting processes pose long-term risks to human population health.

CONTRIBUTION OF POPULATION INCREASE TO ENVIRONMENTAL DISRUPTION

The World Wildlife Fund for Nature has analysed in detail the trends over the past three decades in the vitality and function of major categories of ecological systems, including freshwater ecosystems, marine ecosystems and forest ecosystems. Overall, the “Living Planet Index” has declined by 30% since 1970. Assessments by other researchers and international agencies approximately concur.

The three main determinants of human disruption of the environment are population size, the level of material wealth and consumption, and the types of technology. The ongoing climate change debate illustrates well the relativities between the environmental effects of increases in population and consumption. Historically, during the 20th century, as population increased by just under four-fold the annual fossil fuel emissions of CO₂ increased twelve-fold. In 1995, the 20% of the world population living in high-emission countries accounted for 63% of CO₂ emissions, while the lowest-emitting 20% of population contributed just 2%. Over the coming century the projected world population growth will contribute an estimated 35% of growth in CO₂ emissions, whereas economic growth would account for the remaining 65%.

If the world were to limit carbon dioxide buildup to a doubling of its pre-industrial concentration (i.e., from 275 ppm to 550 ppm) - a level which climatologists think would be tolerable to most ecosystems - then the UN medium population projection of 10-11 billion by 2100 would allow per-person CO₂ emissions similar to those of the 1920-1930s. That is approximately two-thirds less than today's level of emissions. While that looms as a very demanding task, we actually already have much of the necessary technology to greatly reduce emissions without forfeiture of material standards of living. The real challenge is political - to transform current technologies and economic practice.

Overall, then, the larger potential threat is not from the increase in human numbers per se but from mildly environmentally disruptive humans becoming highly disruptive humans - in other words, from a “development” process that would generalise the patterns of production and consumption typical of today's rich countries. Current practices in rich countries are clearly not generalisable to a human population likely to exceed 10 billion and demanding a higher average standard of living. It has been estimated that citizens of high-income countries today each require approximately 4-9 hectares of Earth's surface to provide the materials for their lifestyle and to absorb their wastes - while India's population gets by on one hectare per person. There is not enough Earth to allow more than one hectare of “ecological footprint” per average-person when the world population reaches 10 billion during the coming century - and yet that future world population will presumably wish to live like those in the affluent countries of today.

GLOBAL CLIMATE CHANGE

Despite some disagreement in the scientific community, there is widespread consensus over the existence of climate change and the contribution of fossil fuel use and emissions to that change. Climate scientists forecast that the continued accumulation of heat-trapping greenhouse gases in the troposphere will change global patterns of temperature, precipitation and

climatic variability over the coming decades. A rise of 1-30°C over the coming half-century, greater at high than at low latitudes, would occur faster than any rise encountered by humankind since the inception of agriculture around ten thousand years ago. The UN's Intergovernmental Panel on Climate Change and various other national scientific panels have assessed the potential health consequences of climate change.

These risks to human health associated with climate change will arise from increased exposures to thermal extremes and from regionally variable increases in weather disasters. The human cost of weather-related disasters is now outstripping the capacity of relief agencies to respond; and the economic cost has led many large insurance companies to weigh in alongside environmental and health groups urging rapid action to reduce emissions. Substantial other risks would arise because of the disruption of complex ecological systems that determine the geography of vector-borne infections (such as malaria, dengue fever and leishmaniasis), and the range, seasonality and incidence of various food-borne and water-borne infections, the yields of agricultural crops, the range of plant and livestock pests and pathogens, the salination of coastal lands and freshwater supplies due to sea-level rise, and the climatically-related production of photochemical air pollutants, spores and pollens.

(Adapted from McMichael 2001)

Public health scientists now face the task of estimating, via interdisciplinary collaborations, the future health impacts of these projected scenarios of climatic-environmental conditions. Mathematical models have recently been used, for example, to estimate how climatic changes would affect the potential geographic range of vector-borne infectious diseases. The health effects of climate change would encompass direct and indirect, immediate and delayed effects. While some health outcomes in some populations would be beneficial – some tropical regions may become too hot for mosquitoes, for example, and winter cold-snaps would become milder in temperate-zones where death rates typically peak in winter time – most of the anticipated health effects would be adverse.

Considering that human activities (particularly economic activities associated with fossil fuel consumption) are important contributors to climate change, if one goal of greater global economic integration is increased economic growth in poorer countries (through trade, ODA and FDI), one might ask: How much of the capital transfers from richer to poorer nations is going into sustainable, renewable energy projects, in contrast to fossil-fuel dependent projects? What are the effects of these transfers on climate change indicators in poorer nations? How do these changes associate with disease prevalence rates? How is increased trade affecting the use of fossil-fuel transportation systems? What impact is this having on ground-level ozone or particulate levels and associated respiratory illness?

STRATOSPHERIC OZONE DEPLETION

Depletion of stratospheric ozone by human-made gases such as chlorofluorocarbons has been occurring over recent decades and is likely to peak around 2020. Ambient ground-level ultra-violet irradiation is estimated to have increased consequently by up to 10% at mid-to-high latitudes over the past two decades. Scenario-based modelling, integrating the processes of emissions accrual, ozone destruction, UVR flux, and cancer induction, indicates that some populations will experience a 5-10% excess in skin cancer incidence during the middle decades of the coming century.

BIODIVERSITY LOSS AND INVASIVE SPECIES

Ecologists have long argued that a healthy ecosystem is one with rich biodiversity. Health researchers also find such biodiversity essential in the discovery of new therapeutics. Growth in agriculture and resource-extraction industries, and related increases in population and wealth-based consumption, continues to erode biodiversity. As human demand for space, materials and food increases, so populations and species of plants and animals are being extinguished increasingly rapidly. An important consequence for humans is the disruption of ecosystems that provide "nature's goods and services". Biodiversity loss also means that we are losing, before discovery, many of nature's chemicals and genes, of the kind that have already conferred enormous medical and health improvement benefits. It has been estimated for example that five-sixths of tropical vegetative nature's medicinal goods have yet to be recruited for human benefit.

Nevertheless, to date, biodiversity loss is probably associated more with improved than worsened human health, due to the increased food production and economic growth derived from its loss, and to the various social and cultural infrastructures (health care, education, sanitation and the like) accompanying increased wealth generation. There have been intermittent food shortage crises arising from monocrop production (e.g. the 1996 corn shortage in Mexico) but the trade-off between biodiversity loss and short-term health gain remains difficult to assess. Several multilateral accords on protecting and preserving biodiversity exist, such as the Convention on Biodiversity. The most recent agreement, the Cartagena Protocol on Biosafety, deals specifically with genetically modified organisms (GMOs) and potential threats to biodiversity.

There are also questions about the TRIPS agreement, particularly with respect to granting patent rights on indigenous therapeutics or other life-forms. The World Bank estimated 1990 world sales of medicines derived from traditional knowledge of indigenous plants at \$ 43 billion, little of which went to the people or countries who originally created that knowledge. Developing countries are divided on whether TRIPS should be amended to better protect indigenous knowledge (and so promote health by increased wealth for poorer countries while, perhaps, also protecting biodiversity), or whether all life-forms, including micro-organisms and microbiological processes, should be banned from patent protection on the argument that such processes are a discovery, not an invention.

Meanwhile, "invasive" species are spreading worldwide into new non-natural environments via intensified human food production, commerce and mobility. The resultant changes in regional species composition have myriad consequences for human health. For example: the choking spread of water hyacinth in eastern Africa's Lake Victoria, introduced from Brazil as a decorative plant, is now a breeding ground for the water snail that transmits schistosomiasis and for the proliferation of diarrhoeal disease organisms.

IMPAIRMENT OF FOOD-PRODUCING ECOSYSTEMS

We enter the twenty-first century with an estimated one-third of the world's previously productive land seriously damaged, by erosion, compaction, salination, waterlogging and chemicalisation that destroys organic content. Similar pressures on the world's ocean fisheries have left most of them severely depleted or stressed.

Modelling studies, allowing for future trends in trade and economic development, have estimated that climate change would cause a slight downturn globally of around 2-4% in cereal grain yields (which represent two-thirds of world food energy). The estimated downturn in yield would be considerably greater in the food-insecure regions in South Asia, the Middle East, North Africa and Central America.

Food security is a bridge between health-promoting social and environmental conditions. A strong argument from the South is that, while ODA and FDI remain important, opening northern markets to the products of the South (primarily agricultural and textile) is the most important lever for economic growth and development, at least in the short term. But there are several contentious issues pertinent to increased agricultural trade, food security, environmental degradation, economic growth, and their interrelationship to human health. Will increased food or non-food (cash crop) exports to developed countries create sufficient income for developing countries to pay for the increased food imports they will need to offset the decline in domestic food production?

More generally, what effects will agriculture export-led development have on poverty and income distribution profiles in poorer nations, public tax regimes and associated social development programs (such as health care, education and so on)? There is also a fundamental question being posed in the context of the sustainability of food-producing ecosystems is: How will increased agricultural trade affect greenhouse gas emissions, water shortage and contamination, or other global environmental issues; and how, over time, might this affect domestic food security? This question is most pressing for Africa, which has experienced serious soil erosion in the past decade, with declining food security, and which is the only continent where poverty rates are expected to rise over the next decade. The "environmental debts" of ongoing ecological degradation (which could be enhanced by increased agricultural-led export growth) will soon outstrip the costs of many African countries' already heavy financial debts.

There is growing evidence, for example, that increased and intensified agricultural production is dramatically altering global nitrogen cycles (due to fertilisation) with serious water contamination effects (UNEP, 1999). The relationship between economic growth and environmental sustainability, important *within* nations, is one of the most important global health issues between nations.

Patterns of food consumption are changing fast. These changes are exerting direct and indirect effects on the environment. There are now 3.3 billion cattle, sheep and goats on range-land that has become increasingly vulnerable. There has been a marked deterioration of the quality of grasslands in Africa, the Middle East, China and Central Asia. The combination of over-grazing and overploughing has led to massive soil erosion and generation of dust storms so severe that in recent years dusts from central China have reached Korea, Japan and the USA. The increased demand for animal protein, especially beef and pork, is driving this process.

The unintended consequences of modifying ecosystems can be catastrophic. Consider animal husbandry. Fortifying the feed of herbivorous cattle with animal protein encourages muscle (meat) development and increases milk yields. But when the feed contained the prion that causes scrapie in sheep, it led to epidemics of bovine spongiform encephalopathy (mad cow disease) that ‘jumped species’ to cause variant Creutzfeld-Jakob disease in humans. Antibiotics used in the pork and beef cattle industry proliferate antibiotic resistant organisms. Hormones used as growth promoters can disrupt human endocrine systems. ‘Factory farms’ that do not dispose efficiently of the prodigious quantities of manure they generate, pollute aquifers and spread water-borne diseases such as cryptosporidiosis and E Coli 0157.

(Adapted from Last 2001)

DEPLETION OF FRESHWATER SUPPLIES

Water shortage is rapidly becoming one of the most important global health and environment issues. Freshwater aquifers in all continents are being depleted of their ancient “fossil water” supplies. Agricultural and industrial demand, amplified by population growth, often greatly exceeds the rate of natural recharge. Water-related political and public health crises loom in some regions within decades.

Water shortage and quality have obvious and immediate health impacts and both, globally, are in decline. Provision of potable water has improved, particularly for rural families, though sanitation lags behind (up to 2.6 to 3.3 billion people from 1990 to 2000) and there are increasingly basic questions about the sustainability (safety, sufficiency) of the future supply of water. Problems are most severe in Africa and Asia, but are growing worldwide. Fully two-thirds of the global population are projected to experience moderate to high water stress by 2025; over 2 billion people are projected to be living under conditions of extreme water scarcity.

How will the trajectories of the future economic growth of poorer nations affect the safety and sustainable supply of water? Cost and other fiscal pressures on public governments are increasing discussion of, in some cases multilateral agency support for, increased privatisation of water supplies or, in the case of public supply, changes in pricing to more accurately reflect its market costs. How will water supply and pricing policies reflecting market-based costs affect water access, and the burden of disease associated with “hydrological poverty”, for poorer groups, particularly within poorer nations?

There is also a significant global equity issue here. Tourism is the world's fastest growing industry, with much of the traffic flowing from rich to poor countries. It is often seen as an important source of foreign currency exchange and economic growth for poorer nations. Apart from harmful environmental effects of continually increasing rates of air travel (and these are considerable), or tourism as a vector for the spread of newly-resistant diseases, tourism also drains aquifers and other water sources in poorer countries in gross disproportion to local use. Finally, there is concern over the long-term environmental, and hence human, health effects of what is anticipated to become a huge global market in water.

DEPLETION OF FISH STOCKS

Around 1 billion people, most in developing countries, depend upon fish as their primary form of protein. The global marine fish catch almost doubled between 1975 and 1995, due to industrialization of fish fleets, but at the cost of serious depletion of fish stocks. Some 60% of global fisheries are estimated to be in, or near, depletion crisis, a factor in the slower rate of growth in fish catch over the past few years. There are several environmentally mediated health issues associated with the decline of fisheries, and with associated compensatory measures such as fish farms, shrimp farms and the industrial organization of what had once been a "hunter-gatherer" activity.

Some of these pertain to habitat and biodiversity loss (e.g. destruction of mangrove swamps by shrimp farming), others to the use of antibiotics (farm fish are more prone to disease) and related concerns for human bioaccumulation, and others to the proposed introduction of genetically-modified (faster, larger growing) fish species. Assuming human safety and minimal environmental impact, genetically modified fish with shorter growth cycles and higher protein output/nutrient input ratios may be important in food security, especially in poorer fish-dependent nations. Much will depend on how, and who, will control or regulate such use. There are also concerns that fishery declines (and other environmentally induced changes in food availability/security) lead to the loss of traditional forms of self-reliance and the erosion of health-enhancing cultural practices or solidarity amongst indigenous populations.

The effects of increased global trade in fish products on fish stocks and the environment are mixed. NAFTA studies on the effects of free trade on fish stocks remain equivocal; there is insufficient evidence to pass judgement in any direction. Other studies from developing countries (e.g. Uganda, Argentina) are less sanguine, finding a strong association between liberalisation, increased trade, fisheries depletion and environmental degradation.

DEFORESTATION

As with many of the measures of environmental degradation, one might expect deforestation to be associated with health gains in the short-term (through increased agricultural land and food production, and/or forestry-related economic benefits) but with a declining health utility as longer-term environmentally induced health problems eclipse the short-term gain. These longer term problems would increase hazards associated both with forestry and agriculture such as accidents and chemical exposure, and water contamination.

Health effects of deforestation range from short-term and wide-spread respiratory disorders associated with extensive burning to long term ecosystem disturbances and potential climate change, with estimated negative health outcomes. These questions are more acute for developing countries. While North America and the EU are currently increasing forest cover (although with less diverse mono-crop “tree farms”), forests are declining rapidly in Latin America, Asia and Africa. Global trade is also affecting deforestation rates.

CHEMICAL HAZARDS

Despite growing evidence that some chemicals are toxic to wildlife and humans, and despite some successes in reducing exposures to some of these, the production and industrial use of many suspect chemicals continues, including those linked with deficits in intelligence and development. Continued use of these chemicals is driven by their easy availability, durability, and profitability.

Less than 10% of all chemicals in commerce have been tested for their toxicological properties. While industry is now mounting an impressive campaign to remedy this deficit in information, for nearly half a century human exposures to such materials have taken place on a scale unprecedented in history. Moreover, there are some classes of chemicals for which use is equivalent to disposal. Chemicals, such as a number of organochlorine compounds and heavy metals are highly persistent. Once they enter the environment, they tend to bioaccumulate and move up the food chain.

Various semi-volatile organic chemicals (such as polychlorinated biphenyls) are now disseminated world-wide, via a sequential "distillation" process in the cells of the lower atmosphere, thereby transferring chemicals from their usual origins in low to mid latitudes to high, indeed, polar, latitudes. Consequently, increasingly high levels are occurring in polar mammals and fish and in traditional human groups that eat them. Various of the chlorinated organic chemicals, butyl-tin and other compounds adversely affect the immune and reproductive systems of mammals, including humans. That is, chemical pollution is no longer just an issue of local toxicity.

Chemicals such as **asbestos**, **lead**, and **arsenic** illustrate a different set of problematic exposures related to the modern chemical environment. The modern use of asbestos for example grew dramatically during World War II. Subsequent to the publication of health studies implicating asbestos as a harmful airborne material (associated with asbestosis, mesothelioma and lung cancer) however, there has been a successful global effort to reduce the use of this highly persistent material in many developed countries, and in some developing countries. Nevertheless in many countries of the developing world, asbestos use both in occupational and environmental settings remains a problem. In South Africa for example, asbestos has been widely used in housing construction materials in low-income township developments, such as Soweto.

The heavy metal lead, like asbestos, has many beneficial physical and chemical characteristics, which have fueled its widespread use throughout the world. Yet lead has long

been considered one of the most easily avoidable environmental toxins in the world. It is known to be extremely toxic to the brain, the kidneys, and the reproductive and cardiovascular systems. Exposure in the developing organism can produce permanent neurological damage, while exposure in adults can produce renal damage, along with neuropathological effects.

One of the most environmentally significant uses of lead was its addition to gasoline. A particularly disturbing property of lead, as well as other heavy metals, arises from the fact that once emitted, it can reside in the environment for hundreds of years, and become globally dispersed. Because lead is highly persistent, its past use has created extensive regions where exposures are still well above those recommended by the Centers for Disease Control and Prevention.

The EPA accelerated the phase-out of leaded gasoline in the mid 1980's, and between 1976 and 1990, average blood lead levels in the U.S. population declined from 14.5 to 2.8 micrograms per deciliter. Unfortunately, there are still many developing countries that allow relatively high concentrations of lead in gasoline.

Arsenic, another heavy metal, has been linked to similar human health threats as lead, but it is still commonly used in wood preservatives in both developed and developing countries. In addition, more than 50 million persons in Asia regularly drink water containing toxic levels of arsenic. This has occurred because surface waters became too contaminated from agricultural and industrial activities for use, so drinking water wells had to be set deeply into aquifers that contain high levels of arsenic.

The effects of arsenic range from skin disorders, including cancer, to lung cancer, and include a host of neurological and developmental problems. A recent study in Bangladesh investigated the effects that exposure to arsenic in the drinking water has on pregnancy outcomes and found that rates of spontaneous abortion, stillbirth, and preterm birth were 2.9, 2.24, and 2.54 times higher, respectively, in women exposed to arsenic than in the nonexposed group. The range of negative health effects linked with exposure to arsenic continues to increase. Despite this, effective public policy actions to remediate or prevent this exposure have yet to be proposed.

(Adapted from Davis 2001)

CHALLENGES FOR SCIENTISTS

These global environmental issues, historically unprecedented, thus pose a range of hazards to human health. Epidemiologists face some particular difficulties in assessing these risks. First, most incipient environmental changes have not yet exerted detectable impacts on human health; such impacts are likely to emerge over several decades. Second, many of the causal pathways are of a complex and indirect kind – such as those likely to affect the transmission of vector-borne malaria and dengue fever, or the environmental impairment of agricultural yields and, hence, regional food insecurity. Third, the usual multivariate causality of disease in human populations applies and is further amplified by the coexistent impacts of various environmental changes.

Detecting the early health impacts of global environmental changes will therefore be difficult. Some clues, however, have begun to emerge – as with the northerly spread of tick-borne encephalitis in Sweden in association with winter warming over the past two decades. Some part of the recent spread of malaria and dengue fever may have been due to the climate change that has occurred over the past quarter-century, although there are other competing explanations. The persistence of around 800 million persons suffering from malnutrition may partly reflect the erosion of agroecosystem resources along with the adverse impacts of various large-scale environmental changes on photosynthesis, plant physiology and the occurrence of crop pests and diseases. Other evidence indicates that the tempo of extreme weather events and adverse human impacts has increased during the past decade. This, according to the Intergovernmental Panel on Climate Change, probably reflects the climatic instability that characterises global climate change.

6.2 Local Environment and Development Issues

Like many environment and development problems, the environmental health problems that arise in poor and unserved neighbourhoods are often closely interconnected. The extent to which these become a risk to health also depends upon social, economic and cultural factors. For example, lead in dust becomes a major risk when children play in the dirt and ingest lead-rich soil. Infants are particularly prone to smoke exposure if they are carried on their mother's back. Faeces in the solid waste becomes a special problem if the waste is left in piles for collection, and people pick through the waste. Alternatively, appropriate recommendations on behavioural change are also context dependent. More careful supervision of children, for example, may reduce their exposure to environmental hazards, but result in an income loss with even greater consequences for health. At the local level, environmental risks are so bound up with social and economic conditions that it can be difficult and even counterproductive to address them in isolation.

Nevertheless, at the risk of making somewhat artificial distinctions, it is possible to identify two environmental risks often associated with the two principal disease burdens: diarrhoeal diseases in relation to water, sanitation and hygiene; and respiratory illness in relation to indoor air pollution from household fuel combustion.

WATER, SANITATION AND HYGIENE

As is well documented, various diarrhoeal and other diseases are spread via faecal-oral routes, which are far more numerous when water supplies and sanitary conditions are inadequate. Factors such as poor sanitation, hygiene and access to clean water and food are almost always implicated when the prevalence of diarrhoeal diseases is high, although other factors may also contribute.

Where conventional (piped) services are lacking, water and sanitation facilities tend to be characterised by diversity, inadequacy and high levels of sharing. The difficult access to water induces (mainly) women and children to spend a lot of time and effort on water collection. In urban areas, there may also be high household expenditure on water. Similarly, a scarcity of sanitary facilities can lead to high fees for toilet use and even jeopardise women's security

when forced to seek solitary places to defecate. In both rural and urban contexts, human faeces are used as fertilisers. While sound from an ecological perspective, this can increase the risks of direct contact with faeces and food contamination.

Although many routes of transmission of faecal-oral diseases have been identified, even within a given neighbourhood it is usually difficult to identify which are the most important. Several review studies comparing different risk factors have concluded that the association between sanitation and health is stronger than that between water supplies and health. There are also indications that the quantity of water is often more important to health than the quality. On the other hand, it is also widely acknowledged that water and sanitation improvements that are not accompanied by changes in hygiene behaviour will not necessarily improve health at all.

In summary, while improvements in water and sanitation infrastructure are undoubtedly important, this is not reason to ignore local knowledge or override local priorities. What is important is to take health issues seriously, and ensure that local environment and development efforts are well informed.

HOUSEHOLD FUEL COMBUSTION

There are many non-pollution related health impacts associated with household fuel combustion, but here we discuss the issue of indoor air pollution. Whether (air) pollution occurs indoors or outdoors is critical for its impact on human health. While cooking with smoky fuels is often an outdoor activity, even in urban areas, it can still increase the local level of pollution in the air. Where cooking is done indoors, with insufficient ventilation, pollution levels become highly concentrated. Heating with smoky fuels can increase concentrations considerably. This implies that women (who typically do most of the cooking) and young children (who are often present with their mothers) inhale a large portion of the smoke.

The level and kind of pollution depends on the type of fuel and the combustion efficiency. The choice of fuel can be described roughly as an energy ladder, with fuels such as crop residues and firewood at the bottom, used mostly by poor households, followed by charcoal, kerosene, LPG (bottled gas) and finally electricity, mostly used by the rich who can afford the grid connection as well as the purchase of electricity and electric appliances. Generally, the higher up the ladder, the less polluting and the more expensive the fuel or associated technologies. There is also a rural-urban dimension to the ladder, with crop residues and firewood being more readily available in rural areas, and the smoke having also beneficial side effects such as controlling insects in thatched roofs.

Health risks are, as stated before, often complex and interconnected. Thus crowding, poor ventilation, malnutrition, poor sanitation and lack of immunisation all work with indoor air pollution to produce ill health. One illness often leads into the next. The high estimate for the environmental share in acute respiratory infections is based on a rough calculation of how much indoor pollution may be contributing to these infections: in any given location other risks may be more significant.

The Problem of Indoor Air Pollution

Nearly 3 billion people still rely on traditional biomass fuels (wood, charcoal, animal dung, crop wastes) and coal-burning for household energy needs. Use of these fuels indoors leads to levels of indoor air pollution many times higher than international ambient air quality standards allow for. Typical 24-hour mean levels of particulate matter (PM₁₀) in homes using biofuels may range from 300 to 3,000+ mg/m³ depending on the type of fuel, stove, and housing.

Elevated indoor air pollution levels increase the risk of a range of childhood and adult diseases, such as acute lower respiratory infections (ALRI) in childhood, particularly pneumonia. Elevated risks have also been demonstrated for chronic respiratory disease and lung cancer, mainly in China and particularly in women. The continuing high incidence and mortality of ALRI, together with the fact that it predominantly affects young children, means that this condition makes up by far the greatest proportion of the burden of disease attributable to indoor air pollution.

There is nevertheless some uncertainty associated with the exact risk estimates, necessitating further research to obtain a better understanding of the nature of the exposure-response relationship. Impacts on health go well beyond indoor air pollution however and affect the household economy, women's time and activities, child safety and domestic hygiene, as well as the local and global environment.

(Adapted from von Schirnding et al 2001)

6.3 The Challenge of Linking Local to Global – “Brown” Meets “Green”

The consumption patterns of affluent human settlements are the main driving force creating such problems as global warming and the depletion of the world's non-renewable resources. And if those living in deprived neighbourhoods in poor settlements can do little individually to prevent local environmental hazards from arising, those living in higher income settlements in developed countries have little individual incentive to reduce their contributions to global environmental burdens. However, unlike the local environmental hazards of poverty, the delayed and dispersed environmental burdens of affluent settlements do not fall on the settlements where they originate, and the links to health are far more indirect.

As stated already (see box on Environmental Transition, Section 4) between these two extremes are a range of urban and regional problems that tend to be most severe in and around large, industrialising cities, which are typically located in middle-income countries. Pollution of ambient urban air and waterways are typical examples. They reflect increasing levels of polluting activities, involving especially industries, transport and energy conversion, along with the displacement of sewerage and waste burdens from the neighbourhood to the wider environment. Many of these burdens affect people's health directly, but most also have ecological consequences with more indirect impacts.

Looking to the history of currently affluent human settlements, it is often possible to identify a 'sanitary revolution' in the nineteenth century (when household and neighbourhood

environments became far more healthy) and at least a partial ‘pollution revolution’ in the twentieth century (when ambient air pollution and water ways improved in quality). The hoped for ‘sustainability revolution’ has hardly begun however. An important historical lesson is that during the nineteenth century sanitary reform was defined broadly, debated publicly, and supported by an international movement (albeit concentrated in the more affluent countries). Often led by public health professionals, sanitary reform was clearly ‘mainstreamed’. It was only later, when the problems had greatly diminished, that sanitation came to be seen as a narrow waste disposal issue that could be addressed through infrastructure investment.

The implied environmental transition identifies predispositions, not laws of development: poor settlements do not inevitably have poor sanitation, middle income settlements do not inevitably have poor ambient air quality, and higher income settlements do not inevitably contribute to high levels of green house gas emissions. Equally important, the transition does not identify a trajectory that individual settlements or countries can or have pursued independently.

First, as indicated above, the global burdens associated with affluence are just as likely to fall on distant poor groups as on the affluent themselves (many would say more likely). Thus, higher income settlements may account for most carbon emissions, but poor settlements are likely to be the most vulnerable to climate change.

Second, since the regional and global resources and pollution sinks have been largely appropriated or degraded by the affluent countries, the opportunities for the poor settlements to adopt a resource and pollution intensive development path has greatly diminished. Indeed, the potential for using fossil fuels to drive development is being foreclosed by both declining oil reserves and emerging limits on carbon emissions.

Third, even the measures to address local environmental health problems are influenced by international actors and trends, with or without popular support. With privatisation, for example, multinational corporations are increasingly responsible for supplying water to the urban poor. It must also be kept in mind that there are enormous variations between human settlements and neighbourhoods at similar levels of affluence. A significant part of this variation is undoubtedly due to geographical and historical factors (though a large part of intra-urban variation is also wealth-related). More important from a policy perspective, in some places people have also been much more successful in addressing environmental problems. In all settlements, there are actions that can be taken to reduce environmental burdens, but without good governance it is unlikely that appropriate actions will be taken.

Good governance is critical at every level. In theory (at least according to the principles of subsidiarity), good local governance is more critical to the local environmental burdens of poverty, and good global governance is more critical to the global environmental burdens of affluence. In practice, neither scales of governance nor scales of environmental burdens are so easily divided. Local environmental burdens are physically localised, but are influenced by extra-local economic, social and political processes. If higher levels of governance concentrated exclusively on higher level burdens, localities would not receive the support or even political space they need to address local issues.

Alternatively, global environmental burdens are physically extensive, but originate in and are experienced in localities. If lower levels of governance concentrated exclusively on local issues, the global issues would not receive the local grounding they need. Moreover, a strict correspondence between scales of governance and scales of environmental burdens would have the global actors worrying about the problems of affluence, and leave the poor to their own devices – hardly an ideal for global governance to aspire to.

From a sustainable development perspective, the local burdens primarily undermine the needs of the present generation, while the more delayed and extensive burdens compromise those of future generations. Hence, the need for a balanced approach. In the next section, we look at examples of targeted intervention strategies which have been used to tackle aspects of the disease burden and associated risk factors.

For references and source material see especially:

- 1) McMichael, A.J. *Contribution to WHO Concept Paper: Health and Sustainable Development* (draft working paper prepared as input for the WHO meeting on “Making Health Central to Sustainable Development”, Oslo, Norway, 29 November – 1 December 2001).
- 2) Labonte, R. *Health, Globalization and Sustainable Development* (draft working paper prepared as input for the WHO meeting on “Making Health Central to Sustainable Development”, Oslo, Norway, 29 November – 1 December 2001).
- 3) McGranahan, G. *Environment, Health and the Pursuit of Sustainable Development in Human Settlements* (draft working paper prepared as input for the WHO meeting on “Making Health Central to Sustainable Development”, Oslo, Norway, 29 November – 1 December 2001).
- 4) Last, J. *Health and Sustainable Development – Definitions, Principles and Concepts* (draft working paper prepared as input for the WHO meeting on “Making Health Central to Sustainable Development”, Oslo, Norway, 29 November – 1 December 2001).
- 5) Davis, D. *Sustainable Development, Toxic Chemicals, and Industrial Growth* (draft working paper prepared as input for the WHO meeting on “Making Health Central to Sustainable Development”, Oslo, Norway, 29 November – 1 December 2001).

7 | TARGETED INTERVENTION STRATEGIES

Tackling the disease burden in the face of enormous challenges at global and local levels requires a sustainable, comprehensive, integrated approach that reaches the poorest, most marginalised and displaced. Equitable, sustainable development and a focus on the poor and vulnerable is not an inhibitor of economic growth – on the contrary, if well positioned it is a key driver, as are programmes that empower people and communities. Such empowerment extends to national and regional ownership of programmes developed by the affected countries themselves. Here we describe some selected intervention strategies to address the disease burden, while in the next section we focus on the need to strengthen the health system.

As has been shown, countries face a myriad of health-related problems relating on one hand to poverty and a lack of access to basic services/resources and on the other to large-scale, rapid industrialisation, urbanisation, demographic change, and technological development. Factors contributing to such problems are manifold and complex, but fundamental have been inadequate attention given to health in development policy and practice, and a lack of coordinated management and intersectoral collaboration (we discuss this further in Section 9).

“Health for All in the 21st century”, the renewed Health for All (HFA) policy adopted at the World Health Assembly in 1998, set out for the first two decades of the 21st century, global priorities and targets which aim to create the conditions for people worldwide to reach and maintain the highest attainable level of health throughout their lives. The strategy is based on the principles of social justice, equity and human development and moves from a disease-oriented curative approach to one emphasizing the prevention of ill-health, minimisation of health risks and promotion of population health. Conceived in these terms, the improvement of health requires more than the services delivered by the health sector alone; the contribution of other sectors is explicitly recognized as vital for improving the health and well-being of the population.

WHO’s corporate strategy establishes the goals of building healthy populations and communities and combating ill-health through the adoption of four strategic directions. These are:

- Reducing excess mortality, morbidity and disability, especially in poor and marginalised populations ;
- Promoting healthy lifestyles and reducing factors of risk to human health that arise from environmental, economic, social and behavioural causes ;
- Developing health systems that equitably improve health outcomes, respond to peoples’ legitimate demands, and are financially fair ;
- Developing an enabling policy and institutional environment in the health sector, and promoting an effective health dimension to social, economic, environmental and development policy.

Intersectoral approaches and partnerships have been developed to tackle particular diseases, both communicable (infectious) and non-communicable. Evidence shows that these diseases can be controlled in the world's poorest countries. Effective tools are available and many low-income countries have shown that by using the available tools both widely and wisely, the disease burden can be reduced. Here we give examples of targeted intervention strategies used to address the health burdens of selected communicable and non-communicable diseases.

7.1 Communicable Diseases

HIV/AIDS

Twenty years' experience of the HIV/AIDS epidemic have provided evidence that it is feasible to harness the epidemic and reduce its spread and impact. The key lesson learned is the critical importance of political leadership, both in increasing the visibility of the epidemic and decreasing the stigma associated with HIV/AIDS. There is also a greater understanding of the policies, programmes and partnerships between government and civil society that are needed to better respond to the epidemic across all social and economic sectors.

Despite enormous obstacles still to be overcome, there have also been successes from which valuable lessons can be learned. Proven effective measures for a massively scaled up AIDS prevention effort incorporating education include:

- Accessible, inexpensive condoms;
- Immediate treatment of other sexually transmitted infections;
- Voluntary counselling and testing;
- Prevention of mother-to-child transmission;
- Promotion of harm reduction to reduce HIV infection in drug users, sex and migrant workers, the youth;
- Sexual health education in school and beyond;
- Accelerating access to care, support, and treatment, including psychosocial support, home and community-based care (including of orphans), and innovative new partnerships to provide sustainable and affordable supplies of medicines and diagnostics.

As with other diseases effective care will require affordable drugs and strengthened health systems, including effective drug distribution, strengthened laboratory services and caring health staff. It also requires community action and empowered individuals and families.

In **Thailand**, government determination to enforce 100% condom use in brothels and to ensure wide access to HIV prevention campaigns through schools, the mass media, and the workplace have been key factors in lowering HIV infection rates. The broad-based campaign launched in 1991 with high political commitment at both national and regional levels and cross-sectoral cooperation has led to:

- an increase in condom use – reported condom use in brothels increased from only 14% of sex acts in 1989 to over 90% by 1994;
- a reduction in visits to sex workers – Thai army recruits visiting sex workers fell from almost 60% in 1991 to about 25% by 1995;
- a dramatic reduction in HIV infection rates – HIV infection rates among 21-year-old military conscripts peaked at 4% in 1993 before falling steadily to below 1.5% in 1997.

In **Senegal**, a rapid broad-based response to the HIV/AIDS epidemic has succeeded in holding the spread of HIV at much lower levels than in many other African countries. The government acted swiftly – putting sex education on the timetable in primary and secondary schools, providing treatment for sexually transmitted infections, and actively promoting the use of condoms. As a result the rate of HIV infection rates in Dakar has stayed below 2%, over 60% of men and 40% of women aged 15-24 are now reported to be routinely using condoms with casual partners and the condom distribution rate has soared from 800,000 a year in 1987 to over seven million by 1998.

TB

Increasing poverty, poor environments and the HIV virus have contributed to the resurgence of TB, which thrives on immune systems weakened by other chronic infections and by malnutrition. The Stop TB Initiative, launched by WHO in 1998, is working to accelerate control by greatly expanding the global coalition of partners, pushing tuberculosis higher on the international public health agenda, and increasing significantly the investment in control efforts. These are based on early presentation of chronic coughers, a high index of suspicion in HIV+ people, case detection using microscopy and multiple drug treatment using the “directly observed treatment short course” or DOTS strategy.

MALARIA

Roll Back Malaria (RBM), launched in 1998, is a global partnership founded by the governments of malaria-afflicted countries, the World Health Organization, UNDP, UNICEF and the World Bank, and committed to halving the global malaria burden by 2010. Roll Back Malaria is an integrated strategy that addresses the health and development interface by tackling the underlying causes of malaria, and by strengthening capacity to manage diagnosis and treatment of malaria. Six key elements can be singled out as a basis for success:

- Effective management of malaria, including early detection and response to outbreaks;
- Rapid diagnosis and treatment of those who are ill, including home initiated care;
- Chemoprophylaxis for pregnant women;
- Multiple and cost-effective means of preventing infection;
- Increased use of insecticide-treated materials and, where appropriate, other vector control measures, and broader environmental control measures
- Focussed research to develop, test and introduce new products;
- A well-coordinated movement through stronger capacity to health sector and community level effort;
- A dynamic global partnership supported by a coalition of partners working within a common approach.

Efforts to prevent and control these diseases are among the many practical and achievable ways of alleviating poverty and furthering sustainable development. At the same time many **obstacles** exist that are hampering effective efforts to prevent and control infectious diseases including: lack of funding; lack of attention to health impact of activities in other sectors; weak health systems; low priority to health; lack of political commitment. Of key importance, are the broader influencing factors which lie outside the direct control of the health sector.

NEW RESOURCES AND PARTNERSHIPS FOR INFECTIOUS DISEASE CONTROL

The high disease burden attributable to diseases such as TB and malaria, and the global threat posed by HIV/AIDS, require unprecedented resources and a global alliance to address these health threats in a broader development framework. It has been estimated that total spending on HIV/AIDS prevention and care in low and middle income countries needs to rise to between seven and ten billion dollars each year. The proposed global health fund will, it is hoped, enable countries to achieve more rapid progress in addressing the development, economic and human security challenges created by HIV/AIDS, malaria and TB.

Specific diseases of childhood demand integrated approaches and broad-based partnerships as well. Of the millions of children who die before their first birthday, the majority are killed by one of five causes - diarrhoea, pneumonia, measles, malaria or malnutrition - and often by some combination of them. Early identification and treatment of pneumonia and prevention of rehydration for diarrhoea are critical. Because the signs and symptoms for a number of these conditions of childhood may overlap, recognizing which of these conditions is present in a sick child can be difficult, and a single diagnosis is often inappropriate. Treatment of the sick child may also be complicated by the need to combine therapies for several conditions.

A number of WHO programmes, in collaboration with UNICEF, have developed an initiative called the *Integrated Management of Childhood Illness* (IMCI). The approach gives due attention both to prevention of childhood disease as well as to treatment, emphasizing immunization, Vitamin A supplementation if needed, and improved infant feeding, including exclusive breastfeeding. Exclusive breastfeeding for 6 months, adding oil to staple diets, vitamin A capsules, iodised salt and iron rich foods all supplement the core requirements of

food security. Indeed good nutrition and household food security have a critical role to play in reducing the burden of disease, both directly and indirectly.

Integrated management has presented several key advantages. It has led to more accurate diagnoses in outpatient settings; ensured more appropriate and, where possible, *combined* treatment of major illnesses; and has speeded referral of severely ill children. It has allowed for greater efficiency in training and in the supervision and management of outpatient health facilities, has reduced wastage of resources such as intravenous fluids and antibiotics by treating sick children with the most cost-effective intervention for their condition, and has avoided the duplication of effort that may occur in a series of separate disease control programmes.

A major challenge remains however: how to better integrate case management aspects with broader and longer-term preventive measures. This is key, for sustainable development.

The Global Alliance for Vaccines and Immunization (GAVI) is another example of an international coalition of partners including WHO, UNICEF and the World Bank, national governments, foundations, the private sector and research and public health institutions. It is based on the premise that immunization is a key element of public health, a prerequisite for sustainable development, and a crucial element in enabling every child to reach his/her full physical and intellectual potential. It has five strategic objectives:

- Improve access to sustainable immunization services;
- Expand the use of all existing safe and cost-effective vaccines;
- Accelerate the introduction of new vaccines;
- Strengthen research efforts on vaccines and related products specifically needed by developing countries; and
- Make immunization coverage an integral part of the design and assessment of international development efforts, including debt relief.

7.2 Non-Communicable Diseases, Lifestyle Factors and Environmental Risks

As we have seen, at the same time that many countries throughout the world continue to see their development efforts hampered by the burden of infectious diseases, they are also faced with the rising incidence of non-communicable diseases (NCDs). Non-communicable diseases were not highlighted in Agenda 21 and yet it is clear that they represent an increasing threat to sustainable development. Based on current trends, these diseases are expected to account for 73% of deaths and 60% of the disease burden in the year 2020. Low- and middle-income countries suffer the greatest impact of NCDs.

The rapid rise of NCDs is threatening sustainable development as well as the lives and health of millions of people. It represents a major health challenge to global development in the coming century. The rapid increase in these diseases disproportionately affects poor and disadvantaged populations and contributes to widening health gaps between and within countries. Four of the most prominent NCDs – cardiovascular disease, cancer, chronic obstructive pulmonary disease and diabetes – are linked by common preventable risk factors related to lifestyle. These factors are **tobacco use, an unhealthy diet and physical inactivity**. Here we highlight an approach taken to control tobacco, which could serve as an example of similar approaches needed in tackling other diseases and risk factors.

TOBACCO

The alarming growth rate of tobacco consumption threatens sustainable development throughout the globe. Recent trends in tobacco consumption indicate rising prevalence rates, especially among children, youth and women. The globalization of tobacco consumption restricts the capacity of countries to unilaterally control tobacco within their sovereign borders and transnational tobacco control issues – including trade, smuggling, advertising and sponsorship, prices and taxes, control of toxic substances, tobacco package design and labelling – require intersectoral cooperation, and effective action at the global level.

Global Approach to Tobacco Control

The global approach to tobacco control adopted by WHO and its partners offers a strong illustration of an integrated, intersectoral policy strategy. The United Nations Ad-Hoc Inter-Agency Task Force on Tobacco Control, created by the Secretary General of the United Nations in 1998, has intensified a joint United Nations response, and has galvanized global support for tobacco control. Development of an international legal instrument, the Framework Convention on Tobacco Control (FCTC), represents the first time that WHO Member States have enacted their constitutional right to develop binding international legal instruments to protect and promote global public health. Formal negotiations of the Convention began in October 2000 and it is targeted for adoption in 2003.

The FCTC process is catalysing intersectoral cooperation and national action in support of comprehensive tobacco control policies. Within national governments, the development of the FCTC has created the opportunity for the tobacco control debate to expand to ministries other than health, including foreign affairs, trade and agriculture. Countries as diverse as Brazil, Thailand, and the US have established formal intersectoral committees to prepare for the FCTC negotiations.

In the Philippines, where no national tobacco control legislation exists, the FCTC process has encouraged the creation of a new Tobacco Control Secretariat in the Department of Health, and a joint project between the Senate, the Department of Health and WHO to produce a tobacco control policy paper.

FOOD AND NUTRITION

As we have seen, hunger and malnutrition continue to dominate the health of the world's poorest nations. However at the same time that nearly 30 per cent of the world's population is suffering from one or more of the multiple forms of malnutrition, and almost 50 per cent of the deaths among children under five in the developing world are associated with underweight malnutrition, rapid changes in diets and lifestyles are occurring. This includes increased consumption of diets high in fat and sugar, and low in fruit and vegetables, as well as more sedentary lifestyles – factors which are associated with industrialization, urbanisation, economic development and global marketing.

This is having a significant impact on the nutritional status of populations, especially in rapidly industrializing and industrialized countries. For example a massive global epidemic of obesity is emerging in children, adolescents and adults. More than half the adult population is affected in some countries, the consequences of which include increasing death rates from heart disease, hypertension, stroke and diabetes.

Food, being also a major source of exposure to pathogenic agents, both chemical and biological (viruses, parasites and bacteria), may pose a substantial health risk to consumers, and result in severe economic burdens on individual communities and nations. There has been widespread publicity of a number of extremely serious outbreaks of foodborne disease in recent years. Public concern has also been heightened by episodes of chemical contamination of foodstuffs, and the bovine spongiform encephalopathy (BSE) outbreak and the emergence of vCJD (variant Creutzfeldt-Jakob Disease) which raise questions about the sustainability of current approaches to food production. (see also box, Section 6.1) WHO, in collaboration with FAO, and notably within the FAO/WHO Codex Alimentarius Commission, is working to develop sustainable, integrated food safety systems for the reduction of health risk along the entire food chain.

The Global Environment Monitoring System – Food Contamination Monitoring and Assessment Programme (GEMS/Food) has informed governments, the Codex Alimentarius Commission, and other relevant institutions, as well as the public, on levels and trends of contaminants in food, their contribution to total human exposure, and significance with regard to public health and trade. The programme is implemented by WHO in cooperation with a network of WHO Collaborating Centers for Food Contamination Monitoring and participating institutions located in over 70 countries around the world. It has played an important role as part of national and international efforts to provide assurance regarding the safety of the food supply, and provides the basis – where appropriate – for remedial actions, for standards development, for industry and public education and for resource management.

CHEMICALS

As mentioned earlier concern is mounting about the safety of chemicals in general. In addition to the already existing International Programme on Chemical Safety, in 1994, the Intergovernmental Forum on Chemical Safety (IFCS) - a joint initiative of WHO, ILO and UNEP - was established in response to an UNCED recommendation. The Forum is an example of a non-institutional arrangement in which national governments, intergovernmental

organizations and NGOs can meet to consider issues associated with the assessment and management of chemical risks. Achievements have been considerable. For example, the international assessment of chemicals has been accelerated: by 1997 over 200 additional assessments were completed. In developing recommendations for international action on persistent organic pollutants (POPs), the Forum was able to substantially and quickly advance the groundwork required for international action on POPs.

AIR POLLUTION

As indicated, air pollution, both indoors and outdoors, is a major environmental, health and economic problem, affecting developed and developing countries alike. WHO air quality guidelines have provided background information which enables countries to set their national or regional air quality standards in the context of existing environmental, social, economic and cultural conditions. Worldwide, it is estimated that as many as 1.4 billion urban residents breathe air exceeding WHO air quality guidelines. The Air Management Information System (AMIS) of WHO, which assesses trends in ambient air pollution, has been planned as a component of WHO's Global Air Quality Partnership. This partnership brings together a variety of UN agencies, international and governmental institutions and programmes, research/academic bodies as well as NGOs in collaborative information sharing among members, as well as increasing air pollution management capabilities.

Comprehensive air pollution control programmes that adopt a multidisciplinary approach, and that are based on the collaborative efforts of different entities, both private and governmental, are increasingly called for. Various technical, legal, and economic instruments being used to control pollution, in combination with improved administrative and jurisdictional arrangements that aim at more coordinated and integrated air pollution control, are achieving success. Nevertheless the various sectoral responsibilities for aspects of control at different tiers of government must be clarified, and communities and the private sector must become more involved in development and implementation of control strategies.

With the increasing evidence that biomass smoke exposure indoors increases the risk of a range of common and serious diseases of both children and adults (see box, Section 6.2), pressure is mounting for intensified international action. Potential solutions to the problems associated with domestic fuel use in poor countries are highly dependent on the local context and the specific needs of a particular household energy system. The benefits of intervention actions extend beyond direct health gains associated with reductions in exposure to indoor air pollution, and include health and economic benefits from time saved collecting fuelwood, increased educational opportunities and income-generating activities, as well as ecological benefits resulting from less deforestation, soil erosion, and accompanying losses in soil fertility.

Household Energy and Health: Policy Action and Intervention Measures

While nearly 3 billion people still rely on traditional biomass fuels (wood, charcoal, animal dung, crop wastes) and coal-burning for household energy needs, a wide range of interventions is available which can reduce the impact of household energy on human health.

These include changes to the source (improved stoves, cleaner fuels), home environment (better ventilation) and user behaviour (keeping children away from smoke during peak cooking times). These can be delivered through policies operating at national level (supply and distribution of improved stoves, cleaner fuels), and local level (through community development).

For example several hundred improved stove programmes are in place in over 50 countries ranging from entirely local, non-governmental advocacy such as the ceramic stoves program in Kenya, to national initiatives reaching millions of households - as has been achieved in rural China.

Initial cost - benefit studies conducted on interventions to reduce indoor air pollution indicate that for mortality, benefits may outweigh costs by a factor of around ten or more. In terms of the costs per DALY saved, data from India suggest that improved biomass stoves may save 50-100 USD per DALY, and use of kerosene and LPG stoves in rural areas may result in 150-200 USD per DALY.

Well-targeted and locally relevant interventions that include financial support for technical development and production, as well as for infrastructure for marketing and transport (through income generation and/or micro-credit), accompanied by 'joined up' decision-making by international players and national governments, are likely to have a major impact. Successful implementation however will require participation by local people, collaboration between sectors with responsibility for health, energy, housing, planning etc and an emphasis on market sustainability.

(Adapted from von Schirnding et al 2001)

WATER AND SANITATION

As indicated in Section 3, globally, 1.1 billion people are without access to improved water supply and 2.4 billion are without access to improved sanitation. This results in a severe health burden to developing countries. The Water Supply and Sanitation Collaborative Council (WSSCC) formed in 1996 is an example of an alliance of professionals working in water supply, sanitation and waste management with the mission of enhancing collaboration among developing countries and external support agencies, to accelerate provision of sustainable water supplies, and sanitation and waste management services, particularly to the poor.

The WHO/FAO/UNEP/UNCHS Panel of Experts on Environmental Management for Vector Control (PEEM), is an example of a partnership to address the vector-borne disease problems that can result from water resources development projects as well as urban management and waste water use. Development policy adjustment, health impact assessment, field

research to classify specific health risk factors in water resources development and to test the effectiveness of environmental management interventions, are important aspects of PEEM's work, as well as capacity-building to strengthen health sector input into the national development dialogue.

There has been massive investment in water supply since 1980, but the health benefits have been limited by poor progress in other areas, especially in the management of human excreta. The lack of good excreta management is not only a major cause of sickness and disease, it is a major environmental threat to global water resources. Four major challenges face the water supply and sanitation sector in the years to come, namely keeping pace with a net population growth of more than a billion people over the next 15 years, closing the coverage and service gap, with emphasis on sanitation (which lags considerably behind water supply), ensuring the sustainability of existing and new services, and improving the quality of services.

Lack of involvement of communities in technology selection has been a major constraint. Various approaches and techniques have been developed to encourage local participation in identifying problems and ways to solve them. These participatory approaches need to be applied more intensively to increase the effectiveness of implementing water supply and sanitation.

For source material see especially:

von Schirnding, Y. and Mulholland, C. *Health and Sustainable Development: Policy Review*. Inputs prepared by WHO for the Report of the Secretary-General "Implementing Agenda 21" (prepcom 2, CSD 10; 28 January - 8 February 2002)

8 | BUILDING STRONGER HEALTH SYSTEMS

8.1 Key Functions of Health Systems

To sustain disease control programmes, health systems must be able to respond to the health and social needs of people over their life span. Building on primary health care, sustainable health systems are necessary that guarantee equity of access to essential health functions. These functions include:

- Making quality care available across the life span;
- Preventing and controlling disease, and protecting health;
- Promoting legislation and regulations in support of health systems;
- Developing health information systems and ensuring active surveillance;
- Fostering the use of, and innovation in, health-related science and technology;
- Building and maintaining human resources for health; and
- Securing adequate and sustainable financing.

In 2000 the World Health Organization carried out the first ever global analysis of the world's health systems, defined as comprising all the organizations, institutions and resources that are devoted to producing health actions (ie any effort, whether in personal health care, public health services or through intersectoral initiatives, whose primary purpose is to improve health). Five performance indicators were used to measure performance of health systems in 191 member states in trying to achieve three overall goals: good health, responsiveness to expectations of the population, and fairness of financial contribution.

It was found that progress towards these goals depends crucially on how well systems carry out four vital functions: service provision, resource generation, financing and stewardship. Special emphasis was placed on stewardship, which has a profound influence on the other three aspects. The ultimate responsibility for the overall performance of a country's health system lies with government, which in turn should involve all sectors of society in its stewardship function. This is a major challenge for Ministries of health.

8.2 Key Elements for Building Health Systems

The process of building a health system that effectively meets needs and supports disease control takes time, and will require sustained commitment over 10 years or more. Many parts will need to work in synchrony. There can be no single health system recipe, given the diversity of both country and health service situations in the developing world. Also, each country will have different priority areas for attention early on – in one country it may be drugs, in another human resources and in another communication. Thus, each country will need to prepare a country specific plan for securing its health system.

In developing country specific plans, the role of the various players must be recognised. In a generic strategy such as this one, because of country variations, one cannot make definitive statements about the specific roles of the public service, private sector, NGOs, CBOs and

other players who make up the diverse group of health care providers. What one can say is that all need to work in a co-ordinated fashion towards achieving the country's health and health service goals. Also, each one has particular strengths, such as the national base of the public sector, the responsiveness of private providers and the unique ability of NGOs to reach high risk and often marginalised groups.

It is also not possible to define precisely which interventions will work best to improve health systems, in part because of insufficient health systems research and country variability. However, there are developments that appear to offer good returns and are likely to feature in all plans. These include:

- Strengthening peripheral health systems, and in particular the circumstances of lower level health workers – low salaries and low morale included - as they are the vital ones in delivering care ;
- Strengthening management at district level and decentralisation of decision making. Decentralisation should not however be undertaken in a manner that constitutes “dumping” of responsibility on local health workers and communities without the resources to deliver care ;
- More trained managers, who can effectively mobilise, motivate and innovate, as well as plan, organise and budget, and manage information ;
- Greater local involvement in health facilities, including community oversight of health workers, and greater accountability through service or performance agreements ;
- Regular supervision of health workers. This should be done in a manner that encourages and enables performance, rather than as a policing exercise. Health workers should look forward to supervisory visits as they would a visit from a friend from whom they expect support and ideas on how to deal with challenges.

(Adapted from Buch 2001)

Thus although there may be no generic prescription, it is possible to identify common requirements of an effective health system. All countries will need to:

- Strengthen peripheral health services;
- Provide accessible services by increasing the number of local clinics and ensuring the necessary infrastructure – energy, communication and safe water;
- Staff services with sufficient numbers of capable health workers through more effective training, better conditions of service and reduced brain drain;
- Ensure essential drugs and supplies through strengthened distribution systems and affordable prices;
- Revitalise hospitals to function effectively as sources of referral;
- Achieve management capability commensurate with running services efficiently at national, regional and local levels;
- Fully harness the potential of the private (for profit and not-for-profit) sector, as appropriate to the country, in support of reduced burdens of disease;
- Have clear national health and resource (human, drugs) policies and legislative frameworks;
- Provide sufficient surveillance, monitoring and evaluation to inform interventions;
- Strengthen planning, managing and monitoring capacity within ministries of health

(Adapted from Buch 2001)

8.3 Support for Sustainable Development of the Health Sector

Capacity to support development of the health system is not a “nice to have”, it is essential to disease control, and to building a secure health system. The support needed is diverse, and includes strengthened international partnerships.

Institutional public health capacity, including regional offices of international organisations, and expert centres in the developing world, must be developed within a sub-regional framework, as must south-south co-operation and more effective and relevant links with the north, which will continue to play an important role. The capacity might be reference laboratories, Schools of Public Health or research institutes. Developing world experts should collaborate and network more with each other, be it on disease control or health service issues, and systems and organisations put in place to enable sharing of information. Existing structures, such as that for Polio Surveillance could be readily expanded to serve a broader disease surveillance role.

Health systems, disease programmes and operational research must become recognized as a necessity for improving health system performance, and not a luxury. It must be budgeted for and structured into the system. Ways for its product to be able to influence health policy and practice should be established. Research capability is in need of a strong injection, as are some surveillance systems and the collection of routine mortality statistics.

Every support should be offered to the major drive to put relevant vaccine and drug development onto a fast track, including through GAVI (See also Section 7.1). The potential that these international public goods hold must not be allowed to slip through because of issues of ownership and markets.

The digital divide in hospitals and clinics is another capacity weakness undermining system development. Strategies in ICT hold real potential and clinics should be prioritised, costs kept affordable and mobile telephone and satellite technology exploited.

8.4 Enabling Personal Action to Improve Health

Attaining the basic knowledge and skills to enhance ones health in a manner that favourably influences attitudes and behaviour, can be termed health literacy. In much the same way as literacy enables people to read and experience all the benefits associated with it, so achieving health literacy would allow people to experience the benefits of better health. The approach should be comprehensive and developmental. Too often, single disease programmes provide a burst of information in a manner that tells people what to do, rather than contextualising their learning.

A package of health learning should be identified and linked to its target audience. The resources of the state, including public broadcasters, should be optimally used to spread health messages. Packaging learning in interesting formats, such as radio dramas and linking it to real life make the greatest impact. Community structures and community-based organisations are potentially very valuable routes for health promotion, while use of national figures, such as musicians, and peer education, are also influential means of learning. If there is leadership from Heads of State and a high profile, concerted effort, there is no reason why health literacy cannot be rapidly improved.

The health programme should seek to achieve a real scaling up of community involvement in a range of health issues, starting with the major burdens of disease. At the core is a commitment to mobilise energy and voluntarism in a manner that is difficult for formal health services to match, and to achieve results in groups that formal services struggle to reach. On the one hand, it is important that people do not simply wait for government to do things for them, yet on the other, organisations do not arise spontaneously in sufficient numbers. Health Ministries will therefore need to intervene to create an enabling environment for community involvement, facilitate the emergence of local NGOs and organisations and provide seed funding to get efforts off the ground in hitherto unserved areas.

As situations vary from country to country, there is no single way of going about this. Each country should consider its own situation and incorporate a deliverable approach to community involvement in its country plan. The details may be different, but the aim is common to all countries - to reach all sectors of society, including the poorest and most marginalized, in a sustained programme of social mobilisation in support of health.

(Adapted from Buch 2001)

It is quite clear that the massive effort envisaged against the major burdens of disease and unnecessary death in the developing world will require substantially increased funding. This will not only need to go into disease specific programmes but also into securing the vehicle that provides much of the specific prevention and care that has to be implemented - the health system. The additional funds will need to come inter-alia from countries committing more of their own resources to health, directing funds mobilised from debt cancellation preferentially to health and from the proposed Global Health Fund, which holds the possibility of an increase in funding to the level required to make a difference. Also, in general, more effective co-ordination of donor funding and assistance is needed, to ensure that breaks in essential links in the chain of reduction of disease burden and building of health systems do not occur.

In the next section of this document, we move away from the health sector, and look at actions which are needed outside the health sector, recognising that there are no rigid divides between the “health sector” and the “non-health” sector.

For source material see:

Buch, E. *Poverty and Health in the Context of Sustainable Development* (draft working paper prepared as input for the WHO meeting on “Making Health Central to Sustainable Development”, Oslo, Norway, 29 November – 1 December 2001).

9 MOVING BEYOND THE HEALTH SECTOR

As highlighted throughout this document, it is increasingly recognised that many of the key determinants of health and disease – as well as the solutions – lie outside the direct control of the health sector, in sectors concerned with environment, water and sanitation, agriculture, education, employment, trade, tourism, energy and housing. Addressing the underlying determinants of health is key to ensuring sustained health improvements in the long-term, and, hence, sustainable development.

As we have seen, activities in the energy, transport, agricultural, industrial, commercial, and other sectors, which have implications for health, are often adverse rather than beneficial. This is true both within and among nations (e.g. trans-boundary fossil fuel emissions, internationally traded food contaminated with pathogens, toxic pesticides, etc). Many adverse health consequences of activities in other sectors of society have a localized or regional impact, and the response varies according to the efficiency and effectiveness of the health sector in preventing or controlling these consequences, and the rigour of health and safety laws and regulations. In some nations there is good communication among stakeholders in the sectors involved, but the health sector is often a late-comer, or is excluded from meaningful dialogue that might lead to successful control of hazards to health.

Health sector input into policies and planning of actions in other sectors should be a “given” whenever there is any potential for demonstrable harm to population health. For example, when power plants using carbon-based fuels are planned, the impact of air pollution on the health of people living in the vicinity and downwind must be on the planners’ agenda. Design of arterial roads and other urban infrastructure requires the input of a wide range of experts, to assess health impacts associated with pollution, injuries, indirect effects associated with changes in land-use patterns, etc.

9.1 Intersectoral Policy

The policies of all sectors that affect health directly, or indirectly, need to be analysed and aligned to maximize opportunities for health promotion and protection. This will require health professionals to be more responsive to the primary motivations of professionals from these other sectors, and to be willing to negotiate for policies that are mutually beneficial.

Stronger joint action by health systems and the education sector could contribute substantially and rapidly to the overall improvement of the health status of populations, and to a long-term reduction in health and economic inequalities between groups. Economic and fiscal policies can significantly influence the potential for health gains and their distribution in society. Fiscal policies that contribute to health – for instance, those that discourage use of harmful products, and stimulate consumption of nutritious foods and the adoption of healthy lifestyles – should be encouraged. Such policies, when combined with appropriate legislation and health education programmes, can retard, and even reverse negative trends, particularly increases in non-communicable diseases and trauma.

Agricultural policies can incorporate specific disease prevention measures in irrigation schemes, actively promote integrated pest management to minimize the use of toxic chemicals, establish land-use patterns that facilitate – rather than discourage – human settlements in rural areas, encourage substitution for crops that harm health, and ensure the production of safe and sufficient foods. An energy policy that favours health should support the use of cleaner energy sources. It should ensure that less hazardous and toxic waste is produced, that cleaner and more energy-efficient transport is available, and that buildings are designed to be energy-efficient. The cumulative impact of such policies can be substantial. Their enactment can ensure that health is not sacrificed for narrow short-term sectoral or economic gains.

Intersectoral Policies: Key to Promoting Health

Food policy that encourages consumption of a balanced diet rich in fruits and vegetables; transport policies that encourage bicycle use and maximum use of public transport; expanded use of cleaner forms of energy and reduced tobacco use, together would prevent the emergence of a double burden of disease in developing countries and simultaneously contribute to a more sustainable path of development. Norway, Finland, Canada and Australia have dramatically reduced the epidemics of heart disease and lung cancer over the last decade. This has been due to introduction of changes in foods policy, strong tobacco control, improved attention to transport and energy policy and a long-term commitment to improving the mental health of populations. Strong intersectoral action, backed by fiscal policy, regulation, legislation, health education and public information as well as responsive health services have made the difference.

9.2 Intersectoral Planning

Much progress has indeed been made in forging closer links between health and other sectors, particularly with environment. For example, the health and environment sectors often describe almost identical goals in relation to addressing the threats to people's present or future well-being that result from human-induced damage to the environment. This is not always the case though – DDT use for malaria control in parts of southern Africa is associated with significant health benefits in the short-term, as well as with more insidious environmental risks in the longer-term.

Realising both health and environment objectives, as well as development objectives, depends on the actions of people and institutions outside these sectors. Superficially, this would seem to provide the basis for straightforward partnerships, with relevant sectors agreeing to pursue an intersectoral agenda in support of health, environmental improvement and socio-economic development– not just for the present generation, but for the future as well.

NEED FOR NEW PLANNING TOOLS

Health and sustainable development policies and programmes depend on convenient access to information about a large variety of hazards, ranging from biological hazards in food and water, to chemical hazards such as pesticides, to the different physical and social factors. This is necessary so that health authorities can effectively discharge their responsibility to protect public health. But it also serves to clarify the extent to which health hazards are attributable to environmental and social conditions and/or to the activities and policies of sectors other than health.

Monitoring systems need to be designed to ensure that the exposure information collected is relevant to health concerns, and not merely used to monitor effectiveness of, for example, environmental control measures. Currently, few monitoring systems are set up with the aim of comprehensively assessing the various exposure routes (such as food, air and water) of potential contaminants. Moreover, **integrated** pollution control mechanisms are usually lacking.

In general, knowledge of environment and health risks is segmented, and information incomplete. Commonly, mechanisms to ensure coordination at the national, regional and local levels regarding health impact assessment and the development of adequate reporting systems, is lacking. Equally, mechanisms are frequently not in place to ensure that such information, once obtained, is transmitted to the various relevant sectors for action.

Integrated databases on development hazards, environmental exposures and health are urgently required. This is of particular importance regarding the development of planning tools such as health impact assessment methodologies, and indicators. Well-developed integrated health information systems, based on relevant intersectoral data sets, are essential if scientific monitoring information is to be provided in support of policy and decision-making, planning and evaluation.

NATIONAL PLANNING INITIATIVES

Chapter 6 of Agenda 21 specified that countries should set priorities for action based on cooperative planning by various levels of government, non-governmental organisations and local communities. This has presented an important opportunity for health authorities to influence planning at the national level, and to reverse the trend of environmentally-damaging and health-threatening development. Such planning, oriented to the prevention of health and environmental problems, and involving all levels and sectors, is essential for achieving health and sustainable development.

Many countries, drawing upon WHO and UNDP support, have instituted new policy and planning frameworks and have developed tools to make health and environment concerns an integral part of the planning process. On a world-wide basis, measures to incorporate health and environment issues into national plans and programmes have varied from country to country, depending on priorities, planning mechanisms, and the way in which planning responsibilities are divided. This has led to a wide variety of approaches being adopted including:

- Preparation of health and environment plans for inclusion in the national plans for sustainable development.
- Integration of environmental protection and health plans into national economic and social development plans.
- Review and modification of sectoral plans to include health and environment concerns.
- Incorporation of health considerations into national environmental action plans.
- Intersectoral input into national health policy and plans.

Of particular importance in the future, is the need to integrate health and environment issues into the poverty reduction strategies (PRSPs) that are currently being developed at country level.

National Environment and Health Action Plans (NEHAPs)

Of particular interest are the National Environment and Health Action Plans (NEHAPs) which aim to incorporate health and environment issues into national action plans. Model NEHAPs were first developed by a number of pilot countries in Europe, and by 1999 40 of Europe's 51 member states had completed their NEHAPs. The NEHAP planning process has also been adopted in other regions of the world. By 1997 it was estimated that NEHAPs had been developed, or were being developed, in around 100 countries across the world.

NEHAPs have encouraged a process of intersectoral consultation and collaboration which has led to a greater understanding of the importance of environment and development issues within health ministries and a greater understanding of the importance of health issues within environment ministries. Reviews of the NEHAP planning process have identified a number of strengths, among which are:

- increased awareness and understanding of health, environment and development problems;
- increased focus on prevention;
- adoption of broader approaches;
- improved collaboration between sectors; and
- formation of viable partnerships.

Adoption and implementation across the world has nevertheless been uneven, and weaknesses still remain. These include:

- gaps in data availability and quality;
- difficulty in detecting health and environment trends;
- poor linkages between health and environment data;
- emphasis on symptoms, rather than causes of problems;
- little focus on analysis of management structures;
- lack of capacity for implementation; and
- lack of clarity regarding priority-setting processes

(Adapted from von Schirnding 2001)

LOCAL PLANNING INITIATIVES

Local planning initiatives which address health and environment concerns in sustainable development have been collectively referred to as “Local Environment and Health Action Plans” or “LEHAPs”. These include local Agenda 21 initiatives which address health issues and/or involve the health sector in local development planning, as well as “Healthy Cities” types of approaches.

Healthy Cities

The Healthy Cities movement which started as a small-scale project of the WHO European office in 1987, has now become a major movement involving thousands of cities throughout the world. Successes of Healthy Cities-type approaches have included:

- efforts to place health higher on the agenda of local decision makers in cities and other settings;
- building a strong local lobby for public health concerns;
- dealing with health, environment and development problems through local participation,
- ensuring that all development sectors and agencies, including those dealing with housing, local government, industry, transport and planning, address health issues in their work.

The Healthy Cities concept and approach has been translated in different ways in different places, from Healthy Cities in Europe and Africa, to Healthy Islands in the Western Pacific region, to Healthy Municipalities and Communities in North America, Healthy Villages in the Eastern Mediterranean, as well as healthy “settings” which encompasses schools, market-places and many other sites and settings where people live, work and recreate.

A significant innovation in addressing urban problems in recent years has been the emergence of the Local Agenda 21 initiatives (LA 21). Local Agenda 21 s were seen as the means by which local action plans could be developed within each city and town to implement the many recommendations that were within the Agenda 21 programme of action.

The LA 21 s implemented since 1992 have particular importance for three reasons:

- They represent concrete experiences that have sought to address the many problems associated with urban development.
- Most are locally developed and driven, not developed or imposed from outside, and they generally rely more on locally generated resources than external resources.
- They support (and reinforce) ‘good local governance’ for environment and development.

Although more common in Europe and North America, there are growing numbers of cities with Local Agenda 21 s (LA 21 s) in Africa, Asia and Latin America. From an international perspective, LA 21 s are a source of hope, but still face a number of critical challenges.

- In higher income areas, more needs to be done to ensure that locally driven agendas take the regional and global impacts of local activities into account.
- In low-income areas, securing governmental and international support for local agendas that meet the needs of the more vulnerable groups remains an important challenge.
- Across the board, LA 21s still face the challenge of entering the mainstream of urban politics and policies, without losing their inclusive and consultative character.

One of the major *weaknesses* of LA 21s is that health is typically not a central concern of most of these initiatives. There are a number of untapped synergies between the LA 21 processes and health improvement which could be built on:

- The multi-sectoral and inclusive approach of LA 21s provides a potentially important means of achieving health improvement in Africa, Asia and Latin America.
- Strengthening the health dimension of LA 21s could help ensure that the more vulnerable groups have a better opportunity to articulate their interests.

There are many other weaknesses evident in existing LA 21s. Of most concern for the LA 21 movement itself, although virtually all national governments formally endorsed Agenda 21 (and so committed themselves to supporting the development of LA 21s), is that in most settlements the efforts have been rudimentary or entirely absent. Also, most examples of good practice in LA 21s come from cities where major improvements in the quality and accountability of local government occurred independently of the LA 21.

In principle, LA 21s should have the potential to integrate what is often termed the ‘brown’ public health agenda with broader ‘green’ ecological concerns. Of particular concern in affluent settings, the local character of LA 21s can make it difficult for them to address issues which transcend locality’s boundaries. This is a greater worry for LA 21s in high-income nations, since these generally face more problems of a “transboundary” nature.

The difficulties encountered to date, suggest that LA 21s require stronger regional and national frameworks to support the action needed to address regional and global goals. Also, health has emerged as an important motivating factor in local initiatives in many high-income areas. Of more concern in less affluent settings, despite being local, LA 21s often fail to address issues that threaten the health of the most vulnerable groups. As described earlier, residents of many low-income settlements face severe environmental hazards in and around their homes and workplaces. Indeed, in some settings, ill health is likely to be one of the best indicators of economic, social and environmental deprivation.

One might therefore expect public health issues to emerge at the top of LA 21s in the future – or at least for most of the measures that emerge to be directly relevant to public health. So far, this has rarely been the case. This suggests that LA 21s require more active involvement from the health sector, to ensure that widely acknowledged local health priorities are addressed, especially in relation to poverty.

For references and source material see especially:

- 1) von Schirnding, Y. *Health and Environment in Sustainable Development Planning: the Role of Indicators* (in press)
- 2) McGranahan, G. *Environment, Health and the Pursuit of Sustainable Development in Human Settlements* (draft working paper prepared as input for the WHO meeting on “Making Health Central to Sustainable Development”, Oslo, Norway, 29 November – 1 December 2001).

10 | **CONCLUSION: MAKING HEALTH CENTRAL TO SUSTAINABLE DEVELOPMENT - TOWARDS JOHANNESBURG 2002**

As this document has demonstrated, the relationship between health and sustainable development is both complex and elusive. Work undertaken to elucidate the linkages between health and sustainable development has been ongoing for many years, and has resulted in a substantial body of knowledge. Many initiatives have been undertaken to act upon this knowledge at both policy level, and in the implementation of action strategies to address health and sustainable development issues. This has provided us with examples of “win-win” strategies that lead to improvements in both health and the environment, while contributing to economic development. These are strategies that can be built upon. The Norway meeting provides us with the opportunity to review these, and to highlight further policy issues and action strategies that are needed, to promote the role of health in sustainable development.

SOURCE MATERIAL:

1. Buch, E. *Poverty and Health in the Context of Sustainable Development* (draft working paper prepared as input for the WHO meeting on “Making Health Central to Sustainable Development”, Oslo, Norway, 29 November – 1 December 2001).
2. Davis, D. *Sustainable Development, Toxic Chemicals, and Industrial Growth* (draft working paper prepared as input for the WHO meeting on “Making Health Central to Sustainable Development”, Oslo, Norway, 29 November – 1 December 2001).
3. Labonte, R. *Health, Globalization and Sustainable Development* (draft working paper prepared as input for the WHO meeting on “Making Health Central to Sustainable Development”, Oslo, Norway, 29 November – 1 December 2001).
4. Last, J. *Health and Sustainable Development – Definitions, Principles and Concepts* (draft working paper prepared as input for the WHO meeting on “Making Health Central to Sustainable Development”, Oslo, Norway 29 November – 1 December 2001).
5. McGranahan, G. *Environment, Health and the Pursuit of Sustainable Development in Human Settlements* (draft working paper prepared as input for the WHO meeting on “Making Health Central to Sustainable Development”, Oslo, Norway, 29 November – 1 December 2001).
6. McMichael, A.J. *Contribution to WHO Concept Paper: Health and Sustainable Development* (draft working paper prepared as input for the WHO meeting on “Making Health Central to Sustainable Development”, Oslo, Norway 29 November – 1 December 2001).
7. von Schirnding, Y. *Health and Environment in Sustainable Development Planning: the Role of Indicators* (in press)
8. von Schirnding, Y. and Mulholland, C. *Health and Sustainable Development: Key Health Trends*. Thematic review of Chapter 6, Agenda 21. Prepared by WHO as input to the report of the UN Secretary-General (Prepcom 1, CSD 10; 30 April-2 May 2001).
9. von Schirnding, Y. and Mulholland, C. *Health and Sustainable Development: Policy Review*. Inputs prepared by WHO for the Report of the Secretary-General “Implementing Agenda 21 ” (Prepcom 2, CSD 10; 28 January - 8 February 2002)

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