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HEALTH FUTURES RESEARCH - ITS POTENTIAL ROLE
IN THE FORMULATION OF HFA STRATEGY FOR THE NEXT CENTURY

Health futures in support of health for all: Report of an international consultation convened by the World Health Organization, Geneva, 19-23 July 1993

Health Futures

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World Health Organization
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PREFACE

A consultation on "Health Futures - Results and Methods" was held from 19-23 July 1993 at WHO Headquarters, Geneva. This meeting brought together 38 experts in the health and futures fields, from 16 countries, in order to:

- share and review notable health futures studies and research, the methods involved and the apparent use made of the resulting information for policy and decision-making;
- assess the apparent usefulness and impact of these studies and the appropriateness of the study methods for broad dissemination and use in support of the new public health action;
- generate new ideas on how to foster practical, useful health futures studies and research, sharing the methods with Member States, especially developing countries.

This publication is based on the material presented to the meeting and the discussions that took place. It is oriented around examining existing health futures studies, and the conclusions and recommendations of the meeting as to the potential value of health futures studies and how this might be developed. It does not record all the proceedings in detail.

Structure of the report

The report is structured in five chapters. The first of these introduces the historical background to the consultation and the subject of health futures studies. The second chapter reports on the sections of the consultation that were devoted to reviewing existing health futures studies, and addresses the first two of the three objectives of the consultation reproduced above. Chapter 3 contains several different examples of health futures studies, drawn from those presented during the consultation. These illustrate the breadth and diversity of areas that health futures studies

can inform, as well as the range of tools (techniques and processes) that can be involved in carrying them out. The fourth chapter reports on the sections of the consultation that were devoted to an exploration of the potential for health futures studies, aimed at addressing part of the second and the third of the three objectives of the consultation reproduced above. The final chapter, Chapter 5, draws on discussions throughout the consultation, including the closing plenary sessions, to present some overall conclusions from the meeting, examining particularly the role of Health Futures in the new public health action in support of Health for All.

Details of the programme and participants in the meeting are contained in Appendices 1 and 2 respectively. Appendix 3 reproduces the opening address to the consultation by the Director General of WHO, Dr Hiroshi Nakajima. Appendix 4 contains the opening address by the Director of the Division of Epidemiological Surveillance and Health Situation and Trend Assessment, Dr H.R. Hapsara, and Appendix 5 presents the overview paper by Dr Clement Bezold and Dr Trevor Hancock. A short precis of each of the case studies and futures tools presented during the consultation is given in Appendix 6. Appendix 7 contains brief details of resources for health futures work, including: further sources of information; contact points; and details of relevant futures and health futures organizations and networks.

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INTRODUCTION

This chapter begins by introducing the historical background to the consultation and setting it in the context of Health for All and the new public health action. The second section of the chapter deals with the subject of health futures studies, explains their scope and introduces some key terminology. The chapter concludes with a brief history of health futures activities, including details of some of the networks and organizations working in this field.

WHO and Health Futures - the new public health action and health for all

The quote from the opening statement to the consultation by the Director General of the World Health Organization (included in full in Appendix 3) expresses the goal or aspiration that WHO's Member States have set themselves in working for Health for All. Since the

profound social, political and economic changes that are occurring in much of the world. Economic stagnation or decline, the debt burden and related aggravations of poverty, urbanization, ecological degradation, inter and intra country conflict and violence, and threats to democracy and human rights, all pose formidable challenges to countries in moving towards Health for All.

Against this background, it has become essential to evolve and develop new approaches that will assist in formulating public health action aimed at accelerating progress toward health for all. The importance of futures research in this context was recognized by the World Health Assembly in 1990, and it is implicit also in the conclusions and recommendations of the Saitama Public Health summit held in September 1991 (WHO 1992), which call for exploration of the dynamic

"Our vision of health for all captures fundamental concerns for building lasting peace through social development. The principles of health for all express our yearning for a world where all peoples and individuals have access to effective and affordable health care. It is an aspiration for equity in health opportunities; it represents a quest for social justice." Dr Hiroshi Nakajima, 19 July 1993

adoption of the target of Health for All by the year 2000 by the World Health Assembly in 1979, progress has been made through the adoption in 1981 of a global strategy for achieving this target, and the formulation in many Member States of their own national policies and strategies.

The Director General went on to summarize the conclusions of the 1992 evaluation of progress in implementing the global strategy. Progress on many fronts has been achieved and commitment to the primary health care approach is strong, but in many cases implementation has slowed down. In some regions and countries certain basic health indicators are actually worsening, and in many countries the gap in health, social and economic well-being between the advantaged and the disadvantaged is widening. The difficulties encountered are largely due to the rapid and

relationships between health, environment and development. Particular challenges presented to futures studies are to find ways of working with alternative perceptions of reality, and to develop and use adequate models of social change, while simultaneously incorporating the value principles underlying Health for All, namely: equity; human worth and the moral value of all endeavours towards health development; and the need for wider partnerships in health development.

There are many different definitions of what constitutes the field of 'futures activities, studies or research', this is considered further in a later section. Dr Hapsara, in his address to the opening session of the consultation, suggested that an appropriate common core definition for the purposes of the consultation was that futures studies or research comprised activities whose function is to help in the

examination of the future in order to help guide present action. He stressed that it is important to integrate futures studies and research as an explicit part of the change process of health development, and that in any futures activities, it is vital to consider people themselves as active agents who participate in the process of identifying and deciding their future, and who are not just subjects addressed by scientists and planners. He went on to distinguish four different types of activities (see Figure 1.1) to be considered at the consultation in terms of their potential for shaping future public health

action for the achievement of Health for All.

At the time of the consultation, WHO was in the process of formulating the content of the Ninth General Programme of Work (9th GPW) to cover the period 1996-2001. The 9th GPW has regrouped activities into four different domains corresponding to different policy orientations (health and human development; access to health services; health promotion and protection; prevention and control of priority health problems); each domain involves a number of particular issues, see Figure 1.2.

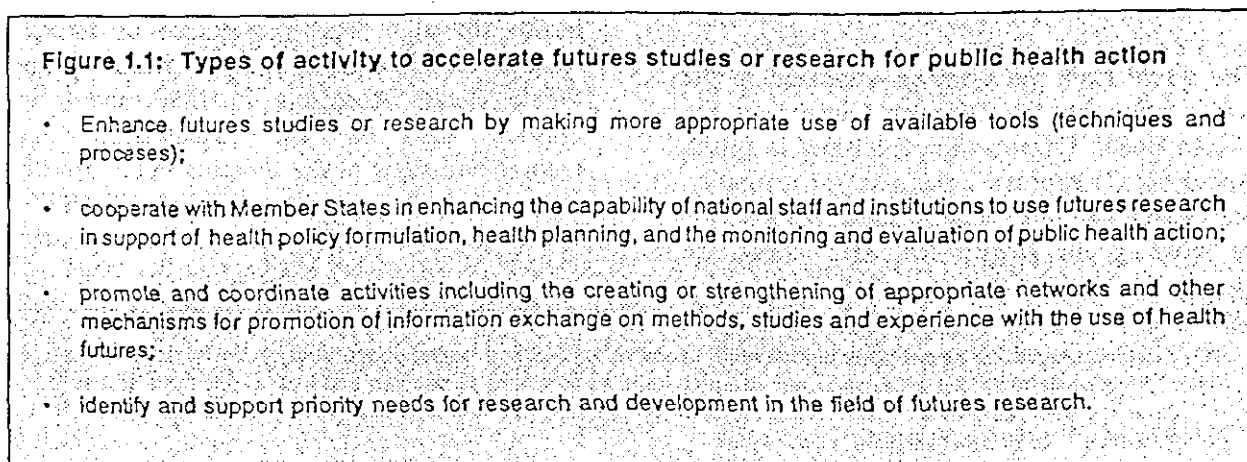


Figure 1.2: Policy orientations and related Issues In the WHO Ninth General Programme of Work

Policy Directions (domains)	Issues discussed in the Consultation
Integrating health and human development in public policies	<ul style="list-style-type: none"> - Health and social-economic development - Policy analysis - Public policy and health - Population and health
Ensuring equitable health services	<ul style="list-style-type: none"> - Alternative health systems - Health resources (manpower, finance) - Assessment of future requirements and demand
Health promotion and protection	<ul style="list-style-type: none"> - Determinants of health (environmental, social, behavioural) - Services for protecting vulnerable groups
Preventing and controlling specific health problems	<ul style="list-style-type: none"> - Health trends/surveillance - Priority settings - Technology development - Preventive/curative interventions
<p>Underlying values and principles Equity - Health improvement - Reduction of disease burden - Cost effectiveness Sustainability - Public involvement - Impact assessment</p>	

This consultation was thus particularly timely in considering how health futures might support the four policy directions of the 9th GPW. These policy directions formed the specific framework for some of the discussions undertaken in small workshops during the later half of the consultation, the outcome of which is reported in Chapter 4.

Health futures - scope and definitions

As terms, 'futures studies' and 'health futures studies' may not be familiar to everyone. This section draws on different contributions to the consultation in order to explain briefly the scope and nature of futures studies, to introduce some key terminology, and to offer a short introduction to the field of health futures studies in terms of some of the networks of practitioners that exist and their publications. Detailed discussion of the content of the field of health futures studies is deferred until Chapter 2. An overview paper by Dr Clement Bezold and Dr Trevor Hancock (Appendix 5) expands on some of the material covered here from one particular viewpoint, and the paper published by Dr Martha Garrett (Garrett 1993), while not specifically about health futures, provides a very useful overview of 'what futurists do and how they do it'.

The basis of a futures study is a concern to investigate, by use of some combination of tools, the content of the future and to improve our ability to think creatively and effectively about the future. The tools involved may be drawn from a wide range of possibilities, including both quantitative and qualitative approaches, various statistical, modelling and simulation techniques, as well as processes for working interactively with groups of people to help them express their views; these are considered further in sections of Chapter 2. A futures study may be undertaken for very different purposes:

- to 'predict' future developments;
- to provide early warning of potentially threatening developments, or potential opportunities;
- to stimulate learning processes, imaginative thinking and creative design for the future;

- to enable people to determine the future they prefer;
- to explore a range of alternative options;
- to support strategic policy development.

The purpose of the study will determine which types of futures the study will investigate, (see Figures 1.3 and 1.4).

Figure 1.3: Different types of futures

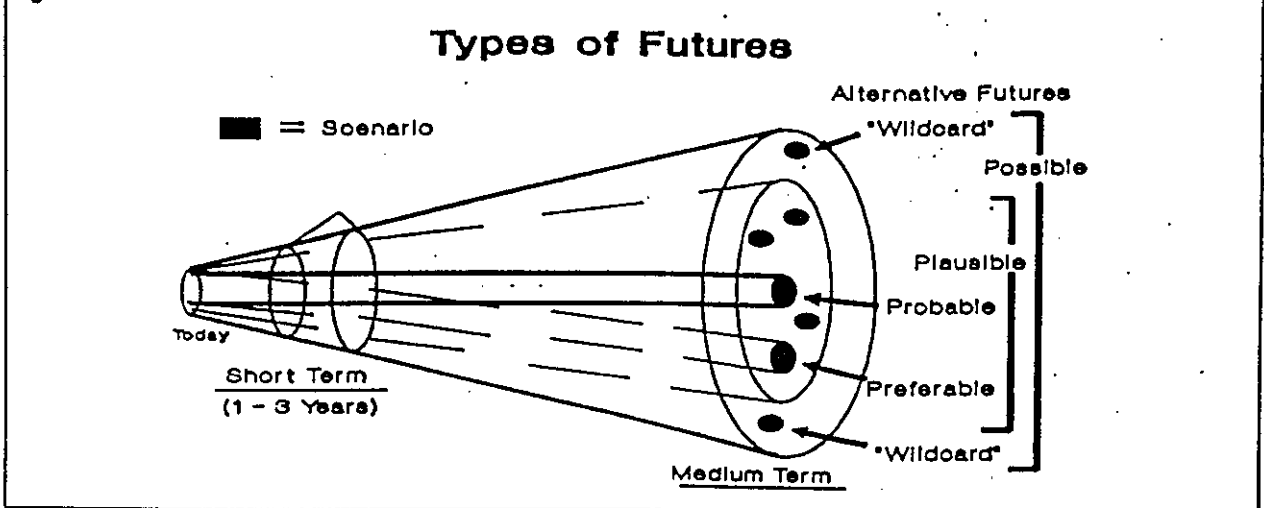
- possible - what may happen
- plausible - what could happen, the more likely possibilities
- probable - what is likely to happen, the most likely possibilities
- preferable - what we want to happen

The purpose of a futures study is of key importance because it forms the basis for selection of an appropriate study design and choice of appropriate methods, as well as for the use of the study results in formulating new policies and bringing about specific actions. Negotiating agreement on the purpose of any futures study can be extremely difficult because of the many different philosophies that people hold about the future, and about futures research. These differences are reflected in the answers that can be given to questions such as these:

- to what extent will the future be a continuation of the past?
- how predetermined and knowable is the future?
- can the future be influenced, shaped, and created?
- where do values fit into futures research?

Some futures studies may adopt the approach that there is one 'most likely' future that will be basically an extrapolation of the past and is already determined by existing trends. Such a study will put considerable weight on gathering data about the past and present, and will be likely to rely on mathematical projection techniques that employ those data. The purpose of study will be to produce a single

Figure 1.4



Source: *An Overview of the Health Futures Field for the WHO Health Futures Consultation* by C. Bezold and T. Hancock

scenario of the 'most probable' future that can be used in designing reactive policies and actions. This type of work can be regarded as indicative and will be aimed at prediction or forecasting.

Other futures studies may be based on quite a different philosophy, believing that the future is more likely to be highly discontinuous from the past and present, and that it is still largely undetermined. Consequently, data about the past and present is likely to be regarded as less important. If the future is seen as something that can be influenced by human action, the purpose of the study is likely to be normative - to construct scenarios of desirable futures that can be used as a basis for determining proactive strategies for reaching those futures. Such studies may also involve the construction of dystopian scenarios to make certain points and to serve as warnings. Figure 1.5 shows some of the typical criteria that futures studies in this category will satisfy. Such studies will focus on envisioning and empowerment rather than on prediction, and will use imagination rather than mathematics as the primary means of projection. Within such an outlook, futures studies focus on generating creativity, ideas, and are strategic processes as distinct from strategic plans.

In yet other cases, the view adopted may be that alternative possible futures exist, each characterized by a certain degree of probability and/or desirability. The future may be seen as existing in many different versions, including a single most probable one and many possible ones, some of which are desirable. Studies working within this view typically carry out exploratory projects for purposes of foresight, using a variety of projection methods, and are concerned to generate and evaluate a range of alternative scenarios.

Figure 1.5: Criteria for normative futures work

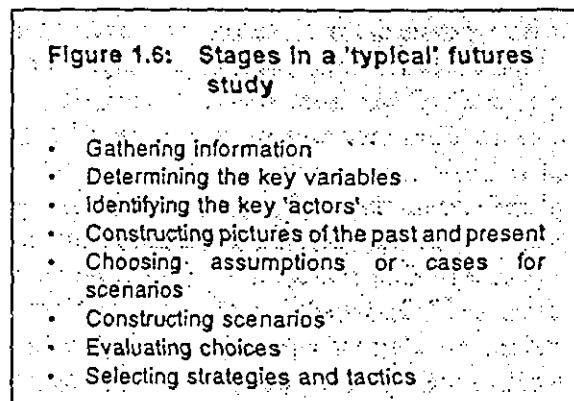
- explore a range of alternative futures
- create new visions of plausible and preferable futures
- involve people in designing or choosing their own future

In talking about health futures it is extremely important to recognise the very wide scope of the concerns involved, reflected in the Health for All strategies and the scope of the new Public Health. Health futures are concerned with exploring the future of health and such questions as 'will we be more or less healthy in the future?', 'what role will health play in our

decision-making in the future?'. The future of health will be affected by the very many different issues that can impinge on individual or collective health, such as future levels of income and income distribution, future living and working conditions, environmental sustainability, etc. For this reason it is important to recognise the difference between health futures and health care or medical care futures (see Bezold and Hancock's paper reproduced in Appendix 5 for an expansion of this discussion). Health care futures are concerned with the future of the health care system, which is just one of the issues that will affect the future of health. Thus health care or medical care futures can be regarded as a subset of health futures.

Stages in a health futures study

It is also possible to distinguish between several different stages in a 'typical' futures study, see Figure 1.6, although individual



studies will not necessarily adhere faithfully to this pattern. Studies vary in the order in which the components are handled, the emphasis that is placed on each and the methods that are employed. This section describes these stages briefly and introduces some key terminology that will be used throughout the remainder of the publication. The reader is warned that there is no widespread consistency yet in the use of some of these terms and that other publications, including some of the papers and studies referred to, may adopt different conventions.

Any sector of life can be visualized as the result of an interplay of many factors. In the case of the health of a country's people, for example, relevant factors that play a role in determining health status include wealth, education, access to sanitation and clean water, quality of nutrition, and health services. Even before they begin a study, most members of the team involved in a health futures study will have different views in their heads about the past and present of those variables; about the improvement or deterioration in certain aspects of public health, about trends in the use of particular medical or health technologies, and so forth. The team should be able to bring these views into sharper focus through the process known as scanning or environmental scanning, which involves identifying the key variables and gathering information (qualitative and quantitative) about them, identifying key 'actors', and constructing pictures of the past and present. For some variables, the team will have access to a long time series of data that makes trend analysis possible. The data points on emerging diseases, developing health technologies, and new social trends may be so few that they may fail to reveal any definite pattern. It is thus possible to make a distinction between trend analysis, which concerns long established patterns, and emerging issues analysis, which deals with new, or newly recognized, phenomena.

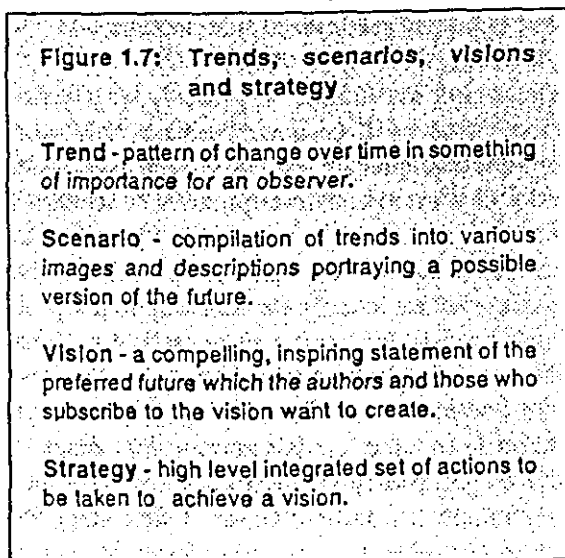
What about the future? Obviously, any health futures study will be concerned not only with the past and present but also with the future and will want to construct pictures or scenarios of that future. Since it is not possible to 'collect data' on the future, it will not be possible to use exactly the same approaches as those used in examining the past and present. There are, however, forecasting techniques -- mathematical and modelling approaches, imagination, and envisioning -- by which a futures group may move from the present into the future. In doing this, as a first step, the group will need to select the cases, or sets of assumptions, for the scenarios. These are the 'if' statements on which the scenarios will be constructed: "If current trends in demography continue..., if the government enacts the

proposed policies..., if a vaccine for the disease is developed by the year 2000..."

Before scenarios can be constructed, basic decisions must be made about how much attention will be given to the history and present state of the variables, which sets of assumptions will be adopted, and which projection methods will be used, (including the extent to which elite experts or the informed or general public will be involved). The choices that are made will depend on the purpose of the study and also on the philosophy of the team involved in the study, as discussed earlier. The members of a health futures team may have considerable difficulty reaching a consensus on these choices.

When a study is concerned with working with a desired or preferable future, the steps above will be modified slightly, so that the preferable future is first envisioned or described in some detail, and possible ways of achieving it are then investigated (a process sometimes referred to as backcasting).

Four terms often used within futures studies are trends, scenarios, visions, and strategy; outline definitions for each of these are given in Figure 1.7.



Health futures activities - a short review

The emergence of studies specifically labelled as 'health futures' studies is a comparatively recent phenomenon. Such studies are still fairly rare, as are the people who call themselves 'health futurists'. Even though these people are a small group, they are by no means homogeneous in their philosophy and approach, and they reflect all the different views discussed in the previous section. However, studies which (although not labelled 'health futures') are concerned with the future of health or health services, and studies or projects containing 'health futures' elements, are carried out on a much more widespread basis by people who would not necessarily refer to themselves as 'health futurists', preferring instead designations such as modellers, mathematicians, strategic planners, epidemiologists, systems researchers, to name but a few. In terms of specific health futures activities, various national government-sponsored activities, international networks, specific projects and other resources are described below; contact addresses are given in Appendix 7. Other more general futures groups and associations are also listed in Appendix 7.

In the Netherlands in 1983, the State Secretary of Welfare, Health and Cultural Affairs founded a Steering Committee on Future Health Scenarios (STG), which has as its chief task the creation of alternative pictures of possible futures in the field of public health and health care, for use in increasing the anticipatory capability of policy-makers and health managers. Since its inception, the STG has produced major studies in a number of fields, including accidents, AIDS, cancer, cardiovascular disease, chronic diseases, dental health care, health care technologies, mental health, and public health. Details of their publications, including those on specific scenario studies, are given in the list of references under STG.

WHO has been involved in health futures activities beginning with the Consultation on Health Statistics Projections in 1971 followed by an issue of the World Health Statistics Quarterly in 1984 on health projections. The Regional Office for Europe has a history of work relevant to this field. Early efforts included the production of a book on 'Health Projections', and the use of futures tools to assist in the process by which the European Regional Strategy for Health for All and specific targets were initially formulated and revised. Two consultations on health futures have also been held in 1990 and 1992, focused specifically on future trends in society and the European strategy for Health for All. Details of the relevant publications can be found in the list of references, under WHO/EURO.

The Pan American Health Organization is WHO's regional office for the Americas and the Caribbean. PAHO has a long tradition of work in the area of strategic and prospective health planning and a recent intensive experience in the field of health futures. PAHO is committed to making health futures tools, forecasts and scenarios available to its Member States, one of the case studies discussed later is a direct result of this work. Components of this programme of work include direct technical cooperation and information dissemination. For example, two workshops on health futures and scenarios for the Region took place in 1992. Collaboration with the Economic Commission for Latin America has resulted in the production of a policy document on "Health in the productive transformation with equity" which includes a futures perspective. This document was presented at the Third Ibero-American Presidential Summit in Brazil in July 1993. Another outcome from this work will be a book which will include further work on scenarios for the region with the purpose of promoting socio-economic growth with equity, focusing on the role of health as a vehicle for development. Other forthcoming work includes the development of training materials. Within the Central American Health Initiative and the sub-regional project on 'Women, health and development', there are plans to include visioning exercises

for the purposes of empowerment. Plans also exist for interagency collaboration with other United Nations organizations such as UNESCO and UNICEF. Another proposal includes the development and implementation of a 21st Century Health Project with the purpose of strengthening the capabilities of teaching institutions, including schools of public health, in the area of utilization of health futures in health policy formulation. There is also a proposal to link Latin American professionals and those from other parts of the world in joint projects (e.g. designing 21st century health systems), with real relevance to the solution of Latin American and Caribbean health problems. There is also interest in developing electronic mail networks and the maintenance of databases on the region, covering social, political and economic domains, technology, and the effects of economic policies on health (particularly for vulnerable groups, such as low income women and children, the elderly, native populations and workers).

The major international network in the field of health futures is the International Health Futures Network (IHFN), which has published a reader on health futures (Bezold, Hancock and Schreuder 1991). The IHFN produces a regular newsletter and compendium twice a year. Projects emerging from the IHFN will catalogue efforts worldwide to invent 21st century health systems and to explore the future of public health. The fourth meeting of the IHFN will take place in May 1994, in Utrecht on the theme of 'Health futures and management: vision research and applications', and will be organized together with a conference on 'Health Care 2000'. Other international activity includes that of the 'Lake Como circle', a network of those working in the field of health futures in industrialized countries, named after the meeting place of the 1985 inaugural meeting which examined at the future of health and health services in industrialized societies. The proceedings of this first meeting were published as a book (Bui Dang Ha Doan 1988) and the group continues to keep in contact through a newsletter which includes information on new and completed studies.

REVIEW OF HEALTH FUTURES STUDIES

The first three days of the consultation were spent examining recent health futures studies. These were divided into six different topic areas: the macro-environment of health; future health status; future health resources; emerging health technology; alternative care systems; and finally, tools for futures health research. For each of these, a number of studies gathered together in a reader, together with presentations of selected health futures studies and tools at the meeting, were used as a basis for answering the following questions:

- *within the topic area, what can health futures studies contribute to planning and policy-making, and specifically, what is their potential use in developing countries?*
- *what is the state of the art regarding methods or tools for use in health futures studies in this area?*
- *what are the gaps in information and methods in this area and what developments (specific studies, and/or development of techniques, software or processes) are needed to fill these gaps?*

This chapter summarizes the findings for each topic area, providing an overview of the current state of health futures studies, before presenting some more general conclusions from the overall review, under the following headings:

- potential usefulness of health futures studies;
- choosing tools for use;
- databases for health futures studies;
- roles of outside agencies in the conduct of futures studies;
- evaluating success and failure;
- health futures: the need for public and participatory studies;
- health futures and ethics.

Some of the studies described in the presentations are not solely health futures studies. In the context of this publication, emphasis is given to the futures components of the different studies, so that the usefulness of such elements can explicitly be brought out.

MACRO-ENVIRONMENT OF HEALTH

The section was introduced with an overview paper by Dr Trevor Hancock, public health consultant in the field of health policy and health futures, Ontario, Canada. The contents of this overview are used throughout this section and it is therefore not summarized separately. There were case study presentations on the development of the Malaysia Health Plan, on the range of National Futures 21st Century Projects carried out in over thirty different countries, on the specific National Futures Project carried out in Peru, and finally, on the Global Model FUGI 7.0.

The presentation on the Malaysia Health Plan covered a wide range of work undertaken in order to formulate an integrated health planning methodology and produce a balanced health plan for the country to meet national policy objectives. The work was thus integrated with the country's national development plan. Specific futures components of the work involved the use of trend analysis and projection to produce estimates of future health status and needs. These were then subjected to scrutiny by expert opinion (using focus group discussions and the nominal group technique), in order to produce modified projections where appropriate and in particular to allow for the effects of different risk factor interventions. The process was carried out using a measure of 'Days of Healthy Life Lost' (DHLL) for

different diseases, which theoretically is a more comprehensive and sensitive measure than conventional mortality and morbidity indicators. A limited amount of scenario development was also undertaken to produce three different scenarios for the organization of the health system, and four different scenarios for the organization of national level health policy and decision-making. The usefulness of the various different futures aspects of the study was also considered. The DHLL results were not widely applied nor used for macro health planning. Major limitations were lack of data availability and consequent doubts about the measure's validity and precision. Given the substantial resource implications involved in the development of the necessary data, the cost-effectiveness of pursuing this approach needs to be examined before any further attempt is made to develop the information systems required. The use of scenarios was found to be particularly helpful at the macro-level. It was recognized however that the treatment of the scenario method had been quite superficial and that it would be useful to carry out more work on the scenarios outlined. Further aspects of the study are discussed in Chapter 3.

National 21st Century Studies, which were the subject of the second presentation, began to appear in the late 1970s and early 1980s. By 1989, over 50 teams carrying out such studies could be identified. The scope and purpose of the different national studies varies from country to country, as do the methods used. Some focus on prediction of the future, some on scenario development of alternative futures, and some are directed towards envisioning, empowerment, and widespread transformation in human beings, organizations and societies. All of the studies are multisectoral, the sectors that are included in detail vary from place to place, as does the extent to which the health sector is studied.

One of the national futures studies, carried out in Peru, was presented in detail. The study's scope and purpose was to identify long term development options and strategies for Peru, to build consensus on long term objectives, and to provide tools for development planning. The

study contained five component projects on: feasible options; desired futures; external factors; long term strategies; long-term planning. The range of methods used included quantitative projection using trend analysis and spreadsheet simulation models, social research and visioning of desired futures, and scenario development. The desired futures project utilized a qualitative approach, in which interviews with young Peruvians in positions of leadership were carried out to explore their ideas about an ideal future for the country. A particular advantage of the spreadsheet-based models was that it was possible to make them easy to use, with readily understandable output reports. Sectoral models were developed for ten different sectors, one of which was health services. The study was considered successful in that it succeeded in identifying important issues that had not previously been considered, and in raising awareness of obstacles and options. It also enabled evaluation of difficulties from different perspectives, providing a basis for development of plans. The sectoral models and their results have been transferred to the National Planning Institute. Public dissemination has taken place through books, short articles and stories, a short TV series and conferences and seminars. One limitation of the study was the very restricted range of variables considered in the health services sectoral model. This was restricted to health service resources and did not include health status variables; mortality is only included in the population sectoral model. In many areas furthermore, constraints of data availability forced simplification and compromise. There were also difficulties in combining the results of the 'desired futures' project with those of the 'feasible options' project.

The last presentation in this section was on the FUGI model, version 7.0. This is a global model for producing long-term forecast simulations of the world economy, within the constraints of the global environment. The model can be used to analyze the world economy, or the economies of individual countries, or groups of countries, within the global system. The world is classified into 180

countries and 80 regional groupings. Four major sub-systems are modelled for each country: environment; development (the economic system); peace and security; human rights. For each country, one of three different types of economic systems can be considered: developed market economy, developing market economy, or transitional economy (the formerly 'planned market economies'). Examples were given of how the model can be used to produce baseline scenarios for GDP growth and to explore the effects of different scenarios about the cutback of carbon dioxide emissions. The FUGI model has been used to produce long-term projections and policy simulations of the world economy for the UN Secretariat, Department of International Economic and Social Affairs, and for the Ministry of Economics, Japan.

"The current world economy is a dynamic organic system, made up of constituent parts or 'members' that are mutually independent. If individual members of the system act only in their immediate national interests without global information, the world economy will be in a state of disorder." Professor Akira Onishi

In examining the macro-environment of health, it is important to stress three issues which need to be dealt with appropriately within a futures study. None of the studies reviewed dealt satisfactorily with all these aspects. Firstly, studies need to address the wider questions of health, and not merely to limit their focus to that subset of the field which comprises medical care. Secondly, it is important to recognize the necessity of examining the interconnectedness between the different components of the environment (for example in the way implemented within Onishi's FUGI model), to include attention to the determinants of health explicitly within the study, and to ensure that these are included within the study design at the appropriate level; related important factors are population heterogeneity and the long latencies associated with some risk factors. The interdependencies between the different sectors of the economy means that a

delicate balance has to be struck between developing a uni-sectoral approach which would ignore the realities of interaction, and making a multisectoral study too complex for execution or understanding. Where national development plans exist, studies on the macro-environment of health need to be integrated with these; as for example has been done in the case of Malaysia, (discussed in Chapter 3 as a case study). Thirdly, an appropriate context for examining these questions is provided by the goal of healthy public policy, i.e. insuring that public policy in all sectors of the economy works in support of promoting and protecting health, see Figure 2.1. Studies of the macro-environment of health should be aimed at providing support to the creation of healthy public policy, by enabling the assessment of possible health consequences of different policy options across a range of sectors.

Figure 2.1: Healthy public policy

"Healthy public policy is the policy challenge set by a new vision of public health. It refers to policy decisions in any sector or level of government that are characterized by an **explicit concern for health** and an **accountability for health impact**. It is expressed through horizontal strategies such as intersectoral cooperation and public participation." (Adelaide conference on Healthy Public Policy, 1988)

"Healthy public policy provides the foundation for promoting physical and social environments that support the adoption of healthy patterns of living. Its aim is to ensure equitable access to the prerequisites for health, whether in the form of consumer goods, supportive living environments or services that contribute to healthy living. It helps to make healthy choices the easy choices. Decision-makers at all levels and in all sectors must be aware of the consequences for health of their decisions. They must also be willing to accept their share of responsibility for health in their communities." (WHO/EURO Health for all targets, 1991)

The review of studies carried out in this field identified a number of common features, which were regarded as shortcomings from some perspectives. Firstly, these studies do not, for the most part, meet the criteria set out earlier in Figure 1.5 for normative futures work or fulfil all the traits identified in Figure 2.4 (later in this section) which have been found to be associated with successful integrated national futures studies. Some particular implications of this are expanded upon below.

Existing work is limited with respect to the nature of the scenarios explored. Typically, these amount to variations on 'business-as-usual', rather than addressing best or worse case scenarios. The macro-environment of health has seldom behaved in a deterministically predictable fashion. Any restriction of health futures studies to examination of the probable, or extrapolations from past and current trends, thus severely limits the potential usefulness of these studies in helping us to anticipate threats and opportunities and to create and realize desirable futures. This exemplifies why Professor James Dator (President of the World Futures Studies Federation) suggests that: "any useful statement about the future should be ridiculous", i.e. out of our common sense, offering us some surprises. Futures studies therefore should include explicit consideration of a range of alternative scenarios. In particular, there is a lack of attention to negative scenarios involving ecological degradation, depletion of natural resources, conflict and violence, or economic decline. In anticipation of such negative possibilities, scenarios exploring them have a role to play in helping us to consider how we would manage any such decline, while maintaining as much as possible our present - or improved - levels of health.

The studies reviewed were also limited in that most of them only focus on GNP or other economic variables as outcome variables. Those studies that do include health outcome variables often use traditional measures of mortality or life expectancy. More attention needs to be given to incorporating more sophisticated or positive measures of health.

"Much more effort is spent measuring the inputs to the health care system than in measuring how healthy the population is. There can be no clearer evidence for this proposition than the fact that many people know how much health care costs as a percentage of GDP, but no one knows if the 'average healthiness' of the population is increasing or decreasing from one year to the next." Dr Michael Wolfson

Some examples of this already exist, the use of 'days of healthy life lost' in the Malaysia study for example. There was a lack of attention within scenarios of the macro-environment to a number of factors, including the implications of new technologies, the implications of militarism and the effects of military spending, and the implications of the problematic nature of democracy. There is also a lack of studies of the effects of health on wealth.

Finally, it was noted that the participation within the process of these studies was usually extremely limited, with a marked lack of participation from the general public. The exceptions that exist, for example the construction of scenarios for 'Desired Futures' in the Peru study, as well as studies considered under other topic headings, illustrate that it is possible to achieve widespread participation in health futures studies.

FUTURE HEALTH STATUS

The topic was introduced by an overview paper by Dr Victor Marshall, Director, Centre for Studies of Ageing and Professor of Behavioural Science, University of Toronto, Canada. The contents of this overview are used throughout this section and it is therefore not summarized separately. This overview was followed by presentations on specific studies in Mexico, Indonesia, Canada and Brazil.

The case study in Mexico focused on health transition, working within the 'protracted-polarized model' of epidemiologic transition. Trend analysis and projection methods were used to produce alternative scenarios of future

health status and needs to be used as a basis for deriving estimates of resource requirements. Results from the study raised awareness among policy-makers of trade-offs, in terms of policy options and their potential effect on health. They were also useful in illustrating the links between pretransitional and posttransitional pathology, and the need to address both types of pathology simultaneously.

The Indonesian case study described a wide programme of work on 'health trend assessment' undertaken in support of the formulation of the Second Long Range Health Development Plan covering the period 1994/95 to 2018/19. As part of this work, scenarios were developed for different measures of future health status in the country; the measures included life expectancy, selected mortality, incidence and prevalence rates, and nutritional status. The methods used to produce these involved a combination of trend analysis and projection, with expert opinion utilized in a structured way (a modification of the Delphi technique) to explore the effects of socio-economic factors, environmental factors, and health care system characteristics on health status. Further details of this part of the study are discussed in Chapter 3. Results from the study were influential in shaping the Second Long-Term Health Development Plan (1994/95-2018/19), as well as the Sixth Five Year Health Development Plan (1994/95-1998/99). They have also been used for regional health trend assessment. The study has also been important in sensitizing people to the need for trend analysis and the skills required to conduct it. Constraints were imposed upon the work by lack of availability of appropriate data in many areas, by limited availability of expertise, and by changes in the decision-makers involved with using the results, necessitating rebuilding of commitment.

The Canadian case study described the model CEPHID. This is a computerized simulation framework designed to allow users to construct and analyze scenarios for Canada's ageing population in terms of health status, income and demography. The concerns of the Ministry of Health and Welfare and the Canadian Mortgage

and Housing Corporation who sponsored the development of the model were to examine future housing and social support needs. The model utilizes a multivariate micro database, built up from a number of data sources using synthetic statistical matching. The approach adopted to projection within the model depends on the type of variable. The demographic projection sub-model (FADEP) includes family structure and is based on dynamic microsimulation. Baseline prevalences for the different health status variables are derived from a 1986 cross-sectional population survey. Since historical trends for these prevalences are not available, the model incorporates no specific projection modelling for these values. Instead, the user is given the opportunity to specify their own health projection scenario in general terms, which can then be combined with the demographic projections. The model is currently undergoing acceptance testing by the project sponsors. Policy relevant projections and scenario explorations now being started.

The Brazilian case study presented a review of current and planned attempts to predict future patterns of HIV infection and AIDS cases in Brazil, together with a description of future modelling activities for the Brazilian Ministry of Health. Trend projections have been produced using a variety of different statistical models. More complex behavioural models will be developed in the future to facilitate the evaluation of different health intervention strategies, and to deal more adequately with population heterogeneity.

A number of general findings of widespread relevance emerged from the content of the studies reviewed. Firstly, the occurrence of 'reverse epidemiologic transitions' (e.g., in countries in Central and Eastern Europe), as well as evidence for the 'protracted-polarized' model of epidemiologic transition in some developing countries, with the implication that such countries will need to deal simultaneously with both pre- and post-transitional problems. Secondly, although there was evidence from a number of studies of the ways that ageing leads to changes in patterns of morbidity, there was

no clear conclusion to be drawn on the existence or not of 'compression of morbidity'. Thirdly, studies provided mounting evidence of the importance of the education of women and accessibility to essential health services (equity) in the improvement of health.

The studies produced conflicting evidence on some other issues, namely: the effect of medical services on health; the effect of population ageing on cost of care; the nature and extent of the poverty-health relationship.

The studies reviewed and presented at the consultation demonstrated the importance of futures studies concerned with health status to both developed and developing countries. Within developing countries, futures planning in this area often appears as part of more general socio-economic planning. The considerable social, economic and environmental changes that are underway throughout the world will have both direct and indirect consequences for the future health status of the world's population. Futures studies can help to identify the possible trends in health status and to explore what actions can be taken to change these in more desired directions. As Jamison and Mosley (1991) demonstrate in the case of the developing countries (although this is equally applicable to the developed countries), adequate policy formation to meet future challenges will require three components: identifying the major disease problems, designing health care delivery systems, and defining and choosing what governments can do.

One potential problem therefore, is to focus too narrowly on a policy response in terms of the provision of medical services, rather than to examine disease prevention and health promotion strategies. It is therefore necessary to have a better understanding of the social determinants of health and the kinds of leverage that can be applied to change these in favourable directions. Unfortunately, many of the current studies in this area address this last issue inadequately, if at all. Within the studies presented at the consultation, the studies in Indonesia and Canada directly attempt to tackle

"Modelling any health future will be incrementally more successful for every additional morsel of attention given to the broad, structural, social and economic determinants of health. The more narrowly any exercise restricts attention to disease treatment or prevention, the less adequate it will be, even if in so restricting itself it increases its precision. We cannot, in other words, afford to trade off precision for conceptual narrowness." Dr Victor Marshall

"It is more important to be imprecise about important things than to be precise about unimportant things." C Wright Mills, quoted by Dr Victor Marshall.

the entire spectrum of factors that can affect health status. In the first of these, in a situation where data availability was limited, a structured method of soliciting and using expert opinion was developed (see Chapter 3 where this is presented as a case study). In Canada, a different, more complex modelling approach could be adopted, taking advantage of well-developed databases. These two examples illustrate another general point: the choice of appropriate methods for use in futures studies will be constrained by data availability, but, even in situations where data availability is poor, methods exist to supplement or enhance this, using expert judgement.

In addition to the studies presented at the consultation, other examples can be given of cases where the implications of different prevention strategies are explored. One such is a study by Lederberg, Shope and Oaks (1992) on emerging infectious diseases and possible prevention strategies to deal with them. This study directs attention to policy initiatives within the broad social and economic field, not just the health sector. A similar direction to policy initiatives is given in the discussion, by Kalache (1993), of possible policy responses to the future needs of old people, especially women, in Chile, where the priority issues were economic rather than connected to medical services. A study by Osmond and Barker (1991) focused on policy-relevant and affectable considerations of diet and infant growth factors in ischaemic heart disease.

Finally, there is a comprehensive health projection model, POHEM (described in Wolfson 1992), which is grounded in a conceptual framework and 'theory of health' encompassing broad socio-cultural, economic and physico-chemical features of the environment. This approach uses microsimulation techniques to enable scenarios for future provision of services and policy initiatives to be explored.

In order to respond to the necessity of exploring health promotion initiatives that will improve health in the future, the challenge is to incorporate the social processes and dynamics of health promotion into health futures studies to a greater extent than so far achieved. Studies need to address the potential for creative use of legislation (not only prescriptive, but also permissive or enabling legislation), to look at the implications of community development strategies, and the implications of successful (or unsuccessful) coordination and collaboration across different sectors (health, social services, housing, transport, environment), as well as exploring different scenarios for the effects of policy initiatives within single sectors.

Another unhelpful restriction in many of the existing studies is a concentration on mortality data to the exclusion of other measures of health status. Exceptions to this can be found in the work on scenario analysis for Canada's elderly, which looks at health in terms of mobility, dexterity, cognition, vision, hearing, kin support and friend/neighbour support, and the work on future health status in Indonesia, which included morbidity, disability and nutritional status.

Some of the studies referred to above demonstrate the clear potential for transfer of methods to other countries. The study of chronic disease mortality by Dowd and Manton (1990) presents an example of how an approach developed in US and European populations can be used in developing countries by incorporating the available information from those developing countries on risk factor levels and total and cause specific mortality at various

ages. Possibilities for the transfer in the reverse direction can also be seen, for example the participative methodology utilized in the Indonesian study (described in detail as a case study in Chapter 3) is equally as relevant for use in highly developed countries.

FUTURE HEALTH RESOURCES

An overview of studies of future health resources was provided by Dr Bui Dang Ha Doan, Director, Centre de Sociologie et de Démographie Médicales, Paris, France. The contents of this overview are used throughout this section and it is therefore not summarized separately. The case study presentations that followed were: firstly, studies focused on human resources, namely, modelling efforts in the US for medical personnel and the construction of scenarios for the future of dental health and health care in the Netherlands; and secondly, health resources in general, a study of problems of future resource allocation in Korea including the provision of resources such as beds and hospitals as well as human resources.

Health resources represent a fairly predictable area, subject to a wide range of policy options for control, and this was reflected in the examples given during the presentations of the impact that modelling efforts in this field could have on policy makers' decisions and choice of options. In the case of the Netherlands, the dental scenario model has been used to simulate a wide range of policy options, and to investigate the implications of possible future changes such as the substitution of dental hygienists for dentists in some tasks. The impact that such scenario models can have on policy-makers was particularly illustrated by the recent decision to open a new dental school to deal with future requirements for services projected by the model. This decision represented a considerable change in policy direction, since only a few years earlier, two such schools had been closed in the face of falling current requirements for dental services.

The experience related in the presentation of the US physician supply modelling demonstrated the use of such models to inform political debate. It was also possible to identify a policy shift over the period from 1988 to 1993, in terms of increased readiness by the Council on Graduate Medical Education to put forward specific policy recommendations to deal with oversupply problems, based in each case on use of the model for scenario analysis. Work is currently being undertaken for the Jackson-Hole group on U.S. health care reform, focusing on estimating the cost reduction implications of reduced levels of physicians (based on estimates of current annual direct and indirect costs generated by physicians - around one million US dollars per physician per annum), and the feasibility of physician reduction. A particular advantage of the models is their ability to successfully identify counter-intuitive implications of the policy options under consideration.

Existing studies are largely carried out from an economic or demographic perspective, sometimes with extensions, for example to examine the effects of substitution. The more closed types of systems, such as dental care, are easier to model, and the Netherlands example is one that can be of direct relevance to other countries. For other types of resources, the models, although complex, do not always approach the complexity of the situation. For example, they do not always adequately include factors such as: multiple employment; the movement of general practitioners into specialties; and workforce migration. These factors may be of particular importance in some developing countries.

Most existing studies in this field, (both the presentations and other material assembled in the reader) were criticized for their limitation in examining only very limited ranges of alternative scenarios, variants on 'business-as-usual'. They thus amount to the provision of extrapolations into the probable future of a steady-state system. In many instances this is not due to the inability of the models used to investigate a wider range of possibilities, but rather to the unwillingness of the policy-makers

and decision-makers who represent the users of the models to investigate outside a narrow range of probabilities. The existing health resource models are often only used to look at the health care system as it is, as opposed to asking wider questions about how it could, or should, be reconfigured. The dental health and dental health care scenarios provide one example of where this is not the case.

All these factors illustrate what can be a general problem of mismatch between the desire of policy-makers for simple presentation of problem issues and their solution, and the appreciation by modellers/analysts of the need to incorporate complexity into their models. Yet a further concern was raised about the lack of influence of such studies on the education sector.

Human and other resource planning is directly relevant to policy makers, and futures studies in this field have a definite role to play in exploring a wide range of different possible scenarios. These can be used to analyze the consequences of different policy options, to aid in priority setting, and to explore the impact of changes in the health system or other sectors in the economy. Developments that would improve their relevance and usefulness would include widening and strengthening the links between modelling human resources, other resources, and other components of the health system. Other factors that require attention in the course of studies include: demographic change; demand and induced demand; prices; spending; affordability; the influence of other sectors; and technological change. There are also other more strongly normative factors that so far have not often been explicitly worked with. Futures studies have the potential to enable exploration of different possibilities through the exploration of detailed scenarios. The relevant factors include: health policy objectives; variation in population health needs over the life cycle; inequities; cost-effectiveness of care; effects of other health relevant interventions (for example fluoridation in the case of dental care). Finally, in order to address possible futures more comprehensively, as opposed to merely extrapolating the present,

studies could focus on exploring the future implications of changes in: health professionals' roles and functions; the nature and scope of health promotion and protection interventions; the provision of treatment and care; support to the terminally ill and the provision of care around the time of death.

EMERGING HEALTH TECHNOLOGY

This section was introduced by an overview paper presented by Dr Takeshi Tsubo, President of the Institute of Health Systems Development, Japan. The contents of this overview are used throughout this section and it is therefore not summarized separately. Dr Tsubo's overview was followed by six presentations: a study of the effects of emerging technology on heart disease in the US; on the implications of community laboratories; trends in traditional medicine; the future of homeopathy; the implications of the use of expert systems for clinical practice guidelines; and finally on emerging technologies relevant to schizophrenia, cataracts, HIV/AIDS and diabetes. The presentations are dealt with below in two sections. The first, on 'Emerging trends in health technology', covers those studies relating to allopathic medicine, while the second, on 'Trends in use and development of traditional medicine', covers non-allopathic medicine. Following this, a third section presents some general conclusions in this area, dealing with the methods used in the different studies, and gaps in the coverage of the studies examined.

Emerging trends in health technology

One presentation focused on a selected number of worldwide health problems of some magnitude; these represented a selection from the much broader survey of future trends in clinical treatment, prevention and health promotion possibilities, published in a book by Fisher (1992). The following scenarios for future availability of new treatments for the selected conditions of schizophrenia, cataracts, HIV/AIDS and diabetes, were identified as

likely:

- new drug therapies for treatment of schizophrenia available on line within the next 10-15 years without any of the negative side-effects of the current treatment regimes;
- development of prevention of cataracts within the next ten years through use of antioxidants: ascorbate, tocopherol and carotenoids;
- development of one or more vaccines for HIV infection by the end of the decade, utilization of different points in the life cycle of the HIV virus for intervention possibilities;
- development of childhood 'vaccination' for type 1 diabetes.

The methods used in this study, namely the use of scanning techniques to examine relevant literatures and a network of expert opinion to identify emerging health-relevant technologies and their likely implications, is one which can be used to great effect. Suitable dissemination mechanisms for the results of such scanning activities are required in order that maximum benefit can be gained, for example, in widening the range of possible futures considered in any particular context.

The presentation on future laboratory technologies for community care reported on a study which aimed to: explore laboratory technologies needing development for use in community care; identify factors influencing the diffusion of these technologies; and demonstrate a method for proactive technology assessment. By the year 2000, tests for monitoring long-standing conditions, such as diabetes, and pregnancy tests, were the only types expected to be performed routinely at home throughout European countries. The remainder of tests carried out in a community setting were expected to take place in the GP's office, and included such things as allergy testing. Although the study had not looked specifically at the issue in developing countries, the technologies involved were transferable to the

developing country situation. The implications of the study thus have relevance in these settings too. The presenter argued that introduction of community- or home- based technology such as testing of blood, self medication etc., can in theory reduce the heavy load of patients in hospitals of developing countries and improve accessibility to services.

The implications of current and emerging technologies for reductions in the incidence of, and mortality from, heart disease, together with the associated health care costs avoided, was investigated for the US over the time period from 1987 to the year 2015. The results estimated a 67% reduction in mortality over the period, with half of this reduction being due to therapeutic advances. Similar studies carried out using expert opinion in France, Germany and the Netherlands have however produced much lower estimates of likely mortality reduction (24% and 8% respectively). Reasons advanced for the difference included transatlantic differences in the views of the importance of social factors in disease. This provides a clear example of a potential weakness of the Delphi technique and other methods for working with expert opinion, namely that the implicit cultural assumptions lying behind the views of a particular group of experts may remain unexamined.

The presentation of an expert system of clinical practice guidelines described a specific system currently in use in the United States. This is a computer-based system offering access to guidelines providing clinicians with a range of treatment plans and resource use, drawn from an expert system containing research, expert, and real world experience of efficient and effective quality medical care. The system enables the treatment and resource use decisions made by the clinician to be recorded, and, where they differ from the range of options suggested by the system, for the clinical thinking behind the course of action chosen to be noted. Clinical reasoning collected in this manner is evaluated and used in the maintenance and revision of each guideline. The system demonstrated currently contains a library of over 450 guidelines. Particular

features of this system that were considered to have helped its acceptance by doctors were: its provision of a range of treatment options (in contrast to some expert systems which provide less or no choice); the incorporation of a medical reference system so that the doctor has access to the sources of the options displayed; the facility for recording the doctors own clinical judgement and reasoning for moving outside the options suggested; and the use of such reasoning in reviewing and updating the guidelines contained in the system. This type of system is certainly applicable in the developing country context, although it was emphasized that the guidelines would need modification for use in different contexts. The system that was demonstrated provides for local guideline incorporation, so that for example, information on treatment options within complementary medical practice could be incorporated where required. The system has considerable potential for use in developing countries. The cost of the computer technology involved is relatively low, and this is an area where future technical developments could be expected to improve the possibilities for making such systems widely available.

Trends in use and development of traditional medicine

Analysis of a number of different studies carried out in individuals countries and regions has demonstrated increasing trends in the utilization of various forms of traditional medicine. This, together with the publication of studies and clinical trials demonstrating therapeutic results from the use of acupuncture, homeopathy, medicinal plants, and therapies such as Qigong, and the increased integration of traditional medicine in clinical practice, research and education in some countries, demonstrates that there is considerable potential for increased use of such therapies in the future. So far the potential implications of a continuation in these trends for the rest of the health system have not been explored in any comprehensive way. This remains an important topic for future study.

Emerging health technology: methods and gaps

The presentations only touched on a part of the field of future health technologies, mainly in therapeutic care. Other areas that will have increasing impact in the future are expected to include advances in molecular biology and recombinant technology which will raise possibilities for much earlier intervention in disease processes, working at the molecular level with molecular therapies. The implications of the creation of a more widespread 'information society' were not fully explored in any of the presentations.

Many of the studies did not consider the implications of the different technologies concerned at population level, in terms of effects on health status and the determinants of health, as well as on resource implications within the health system.

Methods such as that used by Fisher to scan for future technological possibilities, utilizing reviews of the literature and a network of expert opinion, were recognized as being extremely important in the early identification of some of the technological opportunities and constraints that will shape the environment in which future health development takes place. Early warning of such constraints and opportunities, together with widespread dissemination of the relevant information, (especially relating to the evaluation of effectiveness), is required. At the same time, in utilizing new technologies, the challenge remains of ensuring that these are not adopted in a fashion that serves to reinforce, or even widen, the existing inequities in health, thus maintaining or aggravating societal strains. In other words, the need to guard against dominance by expensive high technology therapies which benefit only relatively few people is as urgent as ever. The emerging technologies identified and discussed during the consultation do not focus on those problems unique to the developing countries, (e.g. combating leprosy, malaria), or on problems which are not highly prioritized in the developed world but which represent major

issues in developing countries, (for example TB). This was considered to be very disappointing. A related issue is one of the ethical concerns raised by the development and use of new technologies. A clear example of an area which will raise tremendous political and ethical controversies, stimulated by different religious standpoints, is the human genome project.

Within the field of studies of emerging health technology, a bright future for diversity can be seen; however, there is a tendency to be too disease oriented, too focused around the problems of developed countries with a lack of attention to issues of transferability and public health implications. Emerging health technologies are not equally beneficial to all people globally. Technology transfer is not only a matter of movement from the developed to the developing countries. Reverse transfer can be equally important, as for example demonstrated by the discussions on the value of traditional medicine. Attention needs to be given to correcting developed countries attitudes to, and knowledge of, the needs of developing countries, and taking action: to assess the availability, accessibility and transferability of technologies; to facilitate appropriate transfer; and to monitor the effects of such technologies in use.

ALTERNATIVE CARE SYSTEMS

The topic was introduced by an overview paper by Dr John Bryant, public health consultant, Vermont, USA. The contents of this overview are used throughout this section and it is therefore not summarized separately. Presentations were given on specific studies in Nicaragua, New Zealand, Pakistan and Slovakia, and finally on the recent World Development Report: 'Investing in Health'. The case study presentations and other published studies contained in the reader associated with this topic area illustrated the application of the whole spectrum of types of futures approaches discussed in Chapter 1 to the particular issue of the design of future health care systems. The case study by Rusnak

of Slovakia emphasized the importance of starting with an analysis of the past and current situation, as does the published article by McKee (1992) on Central and Eastern Europe in general. Both of these identified the challenges posed by legacies of deteriorating health, environmental damage, distrust of central planning and paternalism.

A second category is provided by studies dealing with trend analysis and modelling, as well as the case study presented by Malcolm on New Zealand. This includes: published articles by Kalimo et al (1992) on historical and prospective assessments in support of health policies to achieve equity in health care in Finland; by the Coventry Health Authority (1992) in England on a model to support decision-making towards the year 2000; and an article by Saltman (1991) on the movement by Swedish county councils towards market-oriented systems.

The New Zealand case study reviewed the historical process of health service reform in the country, describing the formulation of, and experimentation with, a variety of models for service organization and management, aiming to support the creation of a health system based on primary health care. Innovative features in this work include the uses of capped and capitated budgets for health service provision under the control of a single purchaser for a defined population, together with the involvement of doctors, other health professionals, and the community in decision-making within the capped budget. The aim is to move to population-based, epidemiologically directed, systems of accountability, with prevention and treatment services integrated through a population-based entity known as an area health board. The hospital disappears as an organizational entity, being replaced by primary and secondary health services that extend to both hospital and community settings according to programmatic needs. The work included investigation of different models for putting the responsibility for purchasing service provision into the control of general practitioners. In another project, a Maori community was involved in contracting for the

provision of a comprehensive primary health care service including more accessible and culturally appropriate services to meet their specific requirements. The results from such projects are then used to shape future implementation of organizational change.

The case study presentation from Pakistan demonstrated a similar concern with investigating prototypes as a basis for future health system design. This presentation described the work of the Aga Khan University, acting in partnership with government, to design measures for building a future that is both plausible and desirable, guided by a set of ethical values, in support of goals of equity, effectiveness, affordability and community participation, and particularly aimed at the most vulnerable and underprivileged groups in the country. The results include a primary care system for urban squatter settlements which provides, as a basis for service delivery, monthly home visits from an entry level health worker. The annual cost of the whole system was very low, at US\$3.12 per capita per annum. Service prototypes have been implemented, and the research carried out by the university supports policy formulation and the design of implementation strategies for large scale systems, some aspects of this work are explored further in Chapter 3. A particular futures component in this case study is in 'back-casting' through action research to design measures for building a future that is both desirable and plausible.

"The future is somewhat predictable, occasionally elegantly so. But in settings where the health system response potential to known present realities is blunted, sophisticated modelling of the future seems misguided. Indeed, predicting the future may be less urgent than pausing to ponder what the future should look like and then planning to achieve it." Drs Marsh, Lobo and Bryant.

Another type of futures study in support of the development of alternative health care systems is represented by the explicit use of scenario building to investigate a range of different possible futures. The Nicaraguan case study

presented at the consultation is one example of this; others are provided in published articles by McMahon (1992) investigating three different scenarios for the health system in the US in the year 2000, and by Verschure (1985) on scenarios for the Netherlands.

The Nicaraguan case study started with a review of the social, economic and political instabilities and the devastation of war. Despite such difficult circumstances, groups were prepared to embark on a democratic and consensual approach to scenario building, resulting in the construction of three alternative scenarios: the present situation maintained, a reform scenario, and a scenario of profound change. The three scenarios which resulted from the study are being used to involve the fifteen Nicaraguan political parties in negotiations about constructive action. Proposals for further studies to support the design and implementation of such action are now being formulated and will shortly be presented to the National Policy Forum in Nicaragua.

Visions and strategies can also be used in the context of examining future health systems. One example is provided by the Belmont Vision for Health Care in America (Bezold et al), which brought together health care leaders and decision makers to develop a shared vision for health care. Another example is provided by the work that has been undertaken as part of the Healthy Cities project, using visioning at local level to help people address the question 'what is a healthy community?' (Hancock 1993).

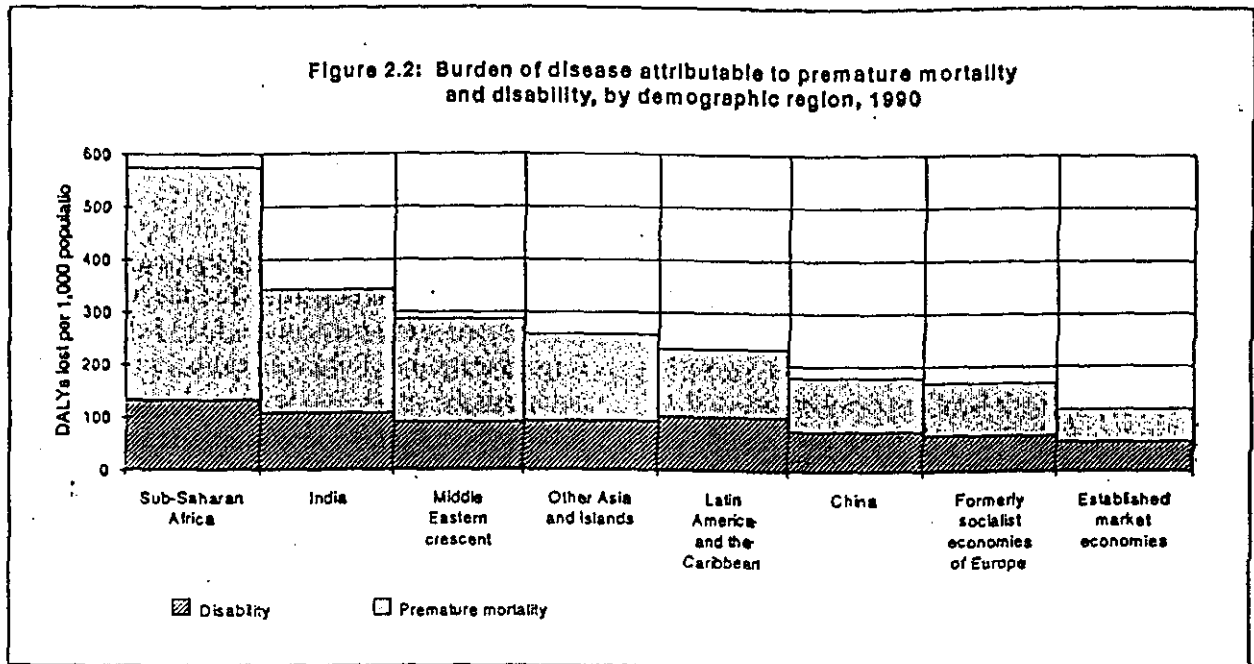
In evaluating the relevance of health futures studies dealing with the design and evaluation of alternative future service configurations to developing countries, it was argued that scenarios, visions and system design projects are approaches that could be useful in a wide variety of circumstances. Studies may help to identify potential unfavourable developments in the future (something to which developing countries can be highly vulnerable), and may provide the basis for taking action to avoid or minimize untoward effects. However, it is also

necessary to be cautious, and to question whether the adoption of a health futures approach would result in added value, or added burden, especially given limited analytical capacities to support the carrying out of such work.

Both the Nicaragua and Pakistan case studies illustrate an important role for the university sector, and in particular for Schools or Departments of Public Health, in forming partnerships with policy makers. Such partnerships can carry out futures studies to identify desired and feasible scenarios. They can also carry out the necessary studies and research to support the design and implementation of appropriate measures to achieve preferred scenarios:

The World Development Report 1993, produced by the World Bank in partnership with WHO, examines the interplay between human health, health policy and economic development. The report examines the challenges facing the health service systems of the future in terms of the current global burden of disease, emerging new health challenges, and the existing health system problems of resource misallocation (to interventions with low cost effectiveness), inequity, inefficiency and increasing costs. The global burden of disease for 1990 is quantified in terms of disability-adjusted life years (DALYs), a measure that combines healthy life years lost because of premature mortality, with those lost as a result of disability. The huge variation in DALYs lost per 1,000 population between different regions in the globe is shown in Figure 2.2.

The report explores some of the policy options available to governments along three different lines: fostering an economic environment that enables households to improve their own health; investing in public health and essential clinical services; and promoting greater diversity and competition in the financing and delivery of health services. An important part of the report is a synthesis of the information that exists on the cost-effectiveness of different types of intervention, in terms of costs per DALY gained. This is used to inform the



Source: *World Bank Development Report 1993*

discussions of options for identifying packages of basic and essential services and their funding. Policies to improve the delivery of health care are analyzed in terms of their potential impact on: allocative efficiency; technical efficiency; and reaching the poor. An assessment is made of the relevance of various policy changes for three country groups: low income countries; middle income countries; and the formerly planned economy countries).

TOOLS FOR HEALTH FUTURES RESEARCH

This section was introduced in an overview by Dr Ron Schreuder, Chief, Strategic Health Planning and Secretary of the Steering Committee on Future Health Scenarios, Ministry of Welfare, Health and Cultural Affairs, The Netherlands. The contents of this overview are used throughout this section and it is therefore not summarized separately. There were presentations on a selected number of tools: the PREVENT model; dynamic modelling methods; the Bioforecasting Technology approach; the use of S-curves; and the use of artificial neural networks for modelling.

To begin with technically the most straightforward: the use of the S-curve for representing patterns of comparative growth is already fairly widespread to model such things as the diffusion of new technology or innovations. The presentation on the use of S curves argued for a more widespread application of the method, as a component of health futures studies, to model growth in disease cases, based on visualizing diseases as being 'in competition' in the marketplace for 'victims'. The presenter argued that this technique provides an accurate way of forecasting the 'natural' growth pattern of different diseases. The appropriateness of this particular application of the method was however questioned by other participants.

The PREVENT model can be used to explore different future scenarios involving changes in lifestyles and the effects of different preventive and other interventions. It has been set up so that it can be applied to different real populations, and is thus transferable for application in other countries. Applications which have helped formulate future policy options at both national, and more local, levels have taken place in the Netherlands, Italy, Sweden and Wales. These have demonstrated

that the model can be very helpful in assisting policy makers to realize that public health, present and future, can be thought about in quantitative terms. Use of the model does however require basic demographic and epidemiological understanding in order to correctly interpret the results for the purposes of exploring future policy options. Drawbacks in the model include some simplifying assumptions which can be criticized, namely that risk factors are independent, and that there is no mortality selection. Other drawbacks are that the model does not examine morbidity, and that it has been set up to explore the effects of decreasing risk factor exposure, and should not, at present, be used to explore scenarios where risk factor exposure is increasing. Development of a more complex model which will deal with more diseases, and remove some of these drawbacks, is underway. It is not expected that this will be as accessible to the user as the PREVENT model, however.

The presentation on dynamic modelling outlined how systems dynamic models can be used to simulate the behaviour of a system in order to make forecasts of its future behaviour, when one or more of the system characteristics changes. Such models can be used to build up and explore alternative future scenarios. The technique draws on applied systems thinking and has its roots in the work of Forrester on the global models familiar from 'Limits to Growth'. Easy application of the approach is facilitated by the use of one of a number of personal-computer based software packages that are widely available, and of relatively low cost. A case study based on work carried out for the New York Association of Homes and Services for the Ageing illustrated a model built to explore future scenarios based on different legislative proposals affecting elderly care and nursing homes; this is described in Chapter 3. Limitations of the approach include dependence on the expertise and art of the systems modeller, so that for example a key stage in the case study was the focus onto a 'generic' home. Some people also consider that the approach is not the most suitable for modelling at the micro-level, (preferring, for example, microsimulation techniques such as those

involved in the Canadian CEPHID model), and should be regarded as a macro or meso level tool only.

The presentation on the Bioforecasting Technology approach described a specially built computer-based systems simulation model. The model can be used to explore future scenarios for different communities in Japan, and could be used in any other country where suitable databases exist. It forecasts the effects of demographic change, socioeconomic and environmental factors, and health system characteristics (including preventive programmes), on mortality, morbidity, health care and service needs, and resource requirements for the different communities. It has been used at community level to explore options for future provision of services and to evaluate these against criteria of equity in terms of health status and distribution of resources, optimality being defined by resource expenditure in different communities in relation to the health needs of that community. It can be used in the context of a wide range of applications at national policy making level, and at local systems planning level. Its outputs will help to identify options for making desired changes in health status, service provision, manpower requirements, and educational and research requirements. The model has been developed over a period of 15 years and validation of model forecasts against historical data shows an improving level of accuracy. It is however extremely data intensive and relies on the availability of detailed individual health records for the current population as well as data on past changes in policy, practice, technology and behaviour at the community level.

The presentation on Artificial Neural Systems (ANS) described a relatively new technique that can be used to produce a model of an existing system in order to make forecasts of the future behaviour of the system when one or more of the inputs change. ANS provide a computer modelling structure determined by inputs, outputs and certain user-defined design parameters; the method is based on the simulation of biological neurons. While

conventional computer modelling requires explicit definition of the relationships between variables, an ANS develops the relationships through a learning process, during which historical information on inputs and outputs is presented to the ANS; and, within the framework provided by the design parameters, the system learns about the associations and patterns present in the data. After this training process is complete, the system can be used to produce forecasts based upon the learned associations. For this reason it is sometimes referred to as a 'self-organizing system'. So far, the use of ANS can only be regarded as being in its formative phase; there are no applications yet in health futures studies for policy making. A small case study of an application to forecasting length of stay was presented. This demonstrated that it was possible to create an ANS which predicted length of stay within a hospital ward well; there was good acceptance of the methods and their validity by the staff. The method has advantages in that it can deal with complex data, and with data inconsistency. Tests have also shown that it can outperform other techniques such as regression in forecast accuracy. There is also widespread availability of a number of software packages for ANS. However there are a number of disadvantages, including sensitivity to choice of design parameters (and the lack of design methodology), requirements for a data set sufficient for the training phase, and requirements for expertise in the system user. There are also major problems with the credibility of the approach, perhaps particularly to policy-makers. The specific conclusion of the presenter was that the method should only be used cautiously, if at all, at present, but that awareness should be fostered and future developments watched for.

In terms of the distinction made in Chapter 1 above between the different possible philosophies underlying futures studies, the methods described here can contribute to studies across the entire spectrum. The choice of any particular tool for use in a study will depend on the context and purpose of the study. The tools presented at the consultation can be

divided between several categories according to their stage of development and use. First, there are those which have been established for some while and are already being used, such as the use of the S-curve for modelling patterns of comparative growth (found as a component of futures studies). In the case of some, such as the PREVENT model and dynamic modelling, use is perhaps not as widespread as it could be. The availability of PC based software means that, in principle, such approaches are highly transferable. Secondly, there are methods where development is complete, and some examples of use in health futures studies exist, but where transferability is limited by requirements for computing technology and relevant databases. An example of this type is the Bioforecasting Technology approach, which relies on the availability of large scale computing resources and requires an extensive individual, and community level, data base. Finally, there are those which represent less well-established approaches, and where any potential use is for the future only; the use of Artificial Neural Systems (discussed later) is an example of such a technique.

The range of tools available for use in health futures studies is obviously much wider than represented in these presentations, see for example the discussion in Chapter 1. The presentations also all focused on quantitative tools, and did not include any presentations on qualitative tools. One such tool to include is 'visioning', used for example in Healthy Cities projects to help communities describe what their vision of a healthy city would contain; this work and the method itself is described in a paper by Hancock (1993). Methods for seeking and using expert opinion such as the Delphi technique will also be relevant and can be used to great effect as a source of surrogate data in situations where existing data bases are poorly developed or lacking.

Methods for multi-criteria decision making can have particular applications in terms of formulating and evaluating alternative scenarios, including the potential for involvement of consumer and community groups in weighting the criteria used to

"We have to bring about a synergistic relationship between the thinkers and the doers ... and I would go on to add that if the doers do a little more thinking and the thinkers are involved a little more in action, then perhaps this world would be a better place to live in." Dr Mishra

"Our capacity for being surprised is too narrow, we have to have a wider capacity to expect the unexpected ... our expectations tend to be too narrow." Dean Harvey Fineberg

"Most policy-makers believe the future is more concrete, knowable and predictable than it actually is." Dr Clement Bezold

develop, or to evaluate, the different scenarios. An introduction to some of the approaches can be found in an article by Reagan et al (1991), which presents an example of their use alongside the use of systems dynamics modelling, as part of a study undertaken to help the New York State Insurance Department explore policy options and make recommendations to resolve the medical-malpractice crisis. Methods for problem or issue structuring and group decision or negotiation support systems can also be useful in a number of ways, for example in the processes of scenario choice, design and assessment. Specific process-oriented tools to facilitate the group work found as a component of many futures studies were not covered explicitly in this section. These are obviously important in managing the process of conducting a health futures study, and in particular in making these into participative studies. Introduction to a number of these tools, including the strategic choice approach, strategic options development and analysis, and soft systems methodology, can be found in a collection edited by Rosenhead (1989). Methods drawing on systems thinking (including systems dynamics, soft systems methodology, strategic assumption surfacing and testing) are covered in Flood and Jackson (1991). Besides these references, other publications that may be useful are Godet's 'Futures studies: a tool box for problem-solving', which provides a systematic overview of the range of tools available and Meadows

and Robinson's 'The electronic oracle: computer models in public policy'; full details of these can be found in the list of references. The documentation of different relevant tools or methods is an area where further work could usefully be done to produce a handbook of tools for health futures studies; this is discussed further in Chapter 4 below.

The potential usefulness of health futures studies

The reports given above of the different studies and their use in policy formulation and support for health system decision-making illustrate the tremendous potential value of health futures studies. It is particularly worth pointing out that many of the examples where studies were clearly oriented around a holistic view of human health and where the effects on policy formulation and implementation were particularly strong come from developing countries. Concerns were raised at several points that studies carried out in developed countries are often less clear in orienting themselves towards health, and often focused solely on medical care, their emphasis is thus on medical futures, rather than health futures, in the sense explained in Chapter 1.

Transferability of tools was an issue that received considerable attention. There are several related areas here. Two of these are considered in more detail below. Firstly, the importance of recognizing that appropriate methods or tools for use in a particular futures study will depend on the specific context in which the study is to be carried out, including the socio-cultural context, but will also be constrained by economic and other factors. Secondly, there is the question of data requirements for health futures studies, again discussed below, where it is emphasized that lack of suitable local data does not prevent a study being carried out, but only constrains the choice of methods to be used. Finally, transferability is affected by local capacities in terms of the necessary personnel with appropriate skills and experience, as well as any resource requirements in terms of computer hardware or software. Direct assistance to

Member States and provision of assistance for supporting the development of national capacities to carry out futures studies has a role to play here, as considered further in Chapter 4.

Despite the examples of the actual value and influence of the range of studies detailed above, there are also a considerable number of academic studies published elsewhere which have not been used for policy-making or planning, pointing to efforts needed to foster closer links between policy makers and health futurists.

Choosing tools for use

The problem is not lack of tools, or even of good tools; the problem is how to ensure appropriate choice of tools for a particular futures study. Figure 2.3 displays some of the questions that could usefully be incorporated in a checklist for the process of selecting appropriate tools for use in a health futures study. This is based on the contributions by Dr Martha Garrett (University of Göteborg) at the consultation; a further discussion can also be found in Garrett (1993). Perhaps the most important question to be answered is whether the use of any particular tool is consistent with the purpose of the particular study and with its underlying philosophy. Teams planning a futures study need to ensure that explicit time is set aside for the selection of appropriate tools for use once the study purposes have been agreed, and the study design formulated.

There are a number of actions which would help individuals or groups in the process of selecting tools, including: the availability of appropriate documentation of tools, together with impartial assessments of the characteristics and advantages and disadvantages of the different tools; dissemination of information on training opportunities in the use of various tools; dissemination of experience in using different tools. Some specific recommendations and suggestions to assist in this areas are discussed in Chapter 4.

Figure 2.3: Points to consider in evaluating tools for use

- is it valid?
- is it robust?
- is it as simple as possible?
- does it do what it is meant to do?
- is it transparent?
- is it user-friendly?
- is it well-documented?
- is training available?
- is it affordable?
- is it data-hungry?
- does it require hardware?
- is it time-consuming?

Is it appropriate to the purpose and context of the study?

Databases for health futures studies

The importance of data bases for carrying out health futures studies received considerable attention throughout the consultation. Technically more complex methods become available for use as *data availability improves*, and lack of appropriate information systems is one of the reasons why some sophisticated models are not easily transferable to developing countries. Efforts are needed therefore to support the development of appropriate demographic and epidemiological information systems for use in futures studies, particularly in developing countries. However, it is important not to neglect consideration of the opportunity cost of initiating extensive data collection systems in support of futures studies or other planning activities. It is also important to realize that methods of soliciting and using expert opinion exist which can be used to supplement existing data sources, often at lower cost than instigating lengthy data collection procedures, by using special surveys etc. It is useful to think in terms of pursuing a strategy of 'optimal ignorance' (a phrase originating in the field of rural development, where it is one of the principles negotiated in the course of individual development projects, see Chambers 1983), where a balance is struck between gathering new data and seeking methods of working without them.

Roles for outside agencies in the conduct of futures studies

A futures study may often be carried out with the assistance of agencies external to the country concerned. While this may be advantageous in terms of providing additional resources and expertise, there are some potential dangers. The study results may be contaminated by conflicts of purpose between the external agencies involved and the priorities of the national government. There may also be disputes over ownership of the results, and within the country the study may be perceived as a 'foreign' product. For these reasons, it may be helpful to limit the role of external agencies in a number of ways, for example: by not allowing them to provide total funding, but accepting only partial assistance; by using external resources to help obtain funding from a variety of sources; for helping in making contacts and obtaining the required forms of expertise; and for provision of training and skills development to local personnel. The example of the National Health Plan Study in Malaysia illustrates how joint conduct of a study by external and local personnel can result in personnel development of local staff through successful transfer of knowledge, skills and technology.

Evaluating success and failure

Seemingly obvious criteria for the success of a health futures study would be the extent to which new insights were gained from the study results, the impact the study had, or the amount of attention paid to the results. In practice however, these may not be so easy to assess. Appropriate frameworks for the evaluation of the effectiveness and validity of studies do not yet exist, although there is some work being carried out to establish guidelines for the evaluation of national futures studies (see below).

It is often difficult to establish the extent to which futures studies have been influential in affecting the decisions and views of policy-makers. In some circumstances, decision-makers may be unwilling to admit the extent of

influence a futures study has had on their views. In other cases a futures study may have identified a number of undesired or worst case scenarios. If these outcomes are then avoided, it may be impossible to attribute this to the futures study, since it could be argued that the outcomes would have been avoided anyway.

Evaluation can be aided by careful clarification at the outset of a study as to the planned purposes and objectives (which can be used to evaluate success), but these will be almost inevitably be subject to a process of renegotiation as the study proceeds.

Although there has been no comprehensive effort to analyze the validity of futures studies in general, an attempt has been made to evaluate the effectiveness of integrated national futures studies, the so-called 21st Century Studies discussed earlier. This evaluation has revealed eight traits that seem to be associated with the most successful projects (see for example, Garrett, Barney, Hommel and Barney 1991). These traits are presented in Figure 2.4 and teams working in the field of health futures may find these guidelines useful.

Health futures - the need for public and participatory studies

Health futures studies have an important role to play in stimulating the necessary public health action for the achievement of Health for All. In order to be in keeping with the principles and values of Health for All, such futures studies need to be public and participatory. This is also necessary if they are to be capable of envisioning what the reality of health for all will be like in different communities, cultures, countries. However such a stance is not without its dangers - such studies will reveal both peoples' dreams and their vulnerabilities, and it is naive to assume that there are not vested interests who may use this to work against achievement of basic Health for All principles such as equity. The challenge lies in seeking strategies that can involve all sectors and interests in partnerships for action where all interest groups have something to gain.

Figure 2.4: Traits associated with successful Integrated national futures studies

- The study is a national team effort, done by the nation's own people, rather than by foreign consultants. It has broad-based support and involves participation by people representing a cross-section of society.
- The study covers all key sectors likely to play an important role in the future and gives particular attention to linkages among these sectors.
- The study adopts a long-term perspective of at least twenty to thirty years, rather than concentrating primarily on short-term issues.
- The study considers the interactions between the nation and the rest of the world in the areas of economy, environment, and security.
- The study identifies national strategies that are environmentally, socially, and economically sustainable, that work well both now and in the long run.
- The study examines relevant moral, philosophical, and political issues and evaluates the adequacy of national institutions in dealing with these issues.
- The study has a clearly stated purpose and is carried out using appropriate methodologies.
- The study includes a major implementation component to stimulate public discussion and bring about policy improvements and practical actions.

Source: Studies for the 21st Century, Edited by M.J. Garrett et. al., December 1991.

Health futures and ethics

"The choice of modelling strategy is not value-neutral" - Dr Michael Wolfson

A general theme surfacing repeatedly in the Consultation was the question of health futures and ethics. All health futures studies inevitably involve ethical issues both in terms of the substantive content (the questions asked) and in terms of the methods used. Much of the ethical content of writings on health futures studies, except for studies specifically relating to questions of equity and justice, remains implicit only. Consideration needs to be given to making the ethical content more explicit. Specific questions which might usefully be examined in the context of different studies are summarized in Figure 2.5.

A clear example of one area where such scrutiny is necessary is in the case of some of the health status measures and quality of life scales used in the context of futures studies (as

well as in other contexts), which place different values on different kinds of lives or people. The acceptability of this should always be subject to scrutiny. A further example is the need to foster responsibility for the future when designing actions to be taken today, by considering the potential consequences of these actions for future generations.

The general approach of health futures is open to taking such ethical issues into account; the emphasis on participatory methods, stressed earlier, is one example.

Figure 2.5: Ethics in health futures - questions to be considered

- to what extent are the vulnerable taken into account?
- whose lives are we talking about?
- what is the value of these lives (now and in the future)?
- what kind of life is worth living?
- what kind of life is worth counting?
- who is doing the thinking, projecting, counting?

THE DIVERSITY AND POTENTIAL OF HEALTH FUTURES

CASE STUDIES

This chapter contains several different examples of health futures studies, drawn from those presented during the consultation. The aim of these case studies is to illustrate some of the breadth and diversity of areas that such studies can inform, as well as the range of tools (techniques and processes) that can be involved in carrying them out. The methods involved are both quantitative and qualitative. Four out of the five examples have deliberately been chosen from studies carried out outside Europe and North America to re-emphasize the conclusion outlined earlier that health futures studies are of great potential usefulness throughout the developing countries, as well as in the developed countries. Indeed, from the studies reviewed in the consultation, it was studies from the developing countries that particularly emphasized some of the characteristics necessary for health futures studies to be of assistance in achieving the goal of Health for All through the stimulation of new public health action.

The case studies included, together with the aspects to be highlighted are as follows. First, a case study from Indonesia describes the use of the RACON methodology, which provides the means of using expert opinion in a structured way to explore the effects of socio-economic factors, environmental factors, and health care system characteristics on health status. The second case study from Malaysia illustrates the integration of health development with national development, and the use of trend analysis and projection. Third, is the description of the production of different scenarios of the health situation and future organization of services in Nicaragua. This participatory study included the formulation of different possible scenarios in social, economic and environmental terms as a basis for examining possibilities for the future health service system. The fourth case study, from

Pakistan illustrates a partnership between university and government, and the use of action research to design measures for building a future that is both desirable and plausible. The final study from the United States discusses the use of systems dynamic modelling for policy investigation, taking as its example an exploration that was carried out into proposed legislation affecting nursing home fees in New York State.

Indonesia: RACON - a method for the structured use of expert opinion

Over the past 25 years, Indonesia has experienced growth in many economic indicators. The labour force and female participation have both increased, and there has been a decrease in the percentage of population living below the poverty line. There has been increasing urbanization. Problems are posed by the quality of public sanitation facilities and environmental sanitation, as well as by aspects of the housing situation. Potential problems are also posed by deforestation and the use of agricultural chemicals, nuclear energy and medical radiation. In health status terms, over the same period there has been a significant increase in life expectancy and a significant decrease in infant and child mortality rates. The epidemiological transition from communicable to non-communicable diseases is beginning to become more apparent. Within the National Health System there are particular problems with inadequate coverage in remote rural areas and with the functioning of the referral system.

Commencing in 1990, a wide programme of work on 'health trend assessment' was undertaken in support of the formulation of the Second Long Range Health Development Plan covering the period 1994/95 to 2018/19. The work proceeded in two phases, the first covered a situational analysis of the past 25 years and

the second examined the period twenty five years into the future. In this description of the work, the focus will be on the use of a specific method, the RACON method; which permits the use of expert opinion in a structured way to explore the effects of socio-economic factors, environmental factors, and health care system characteristics on future health status. The first section below presents a brief overview of the work as a whole, to provide the necessary context for the discussion of the use of RACON that follows. A final section summarises some of the main implications of the case study.

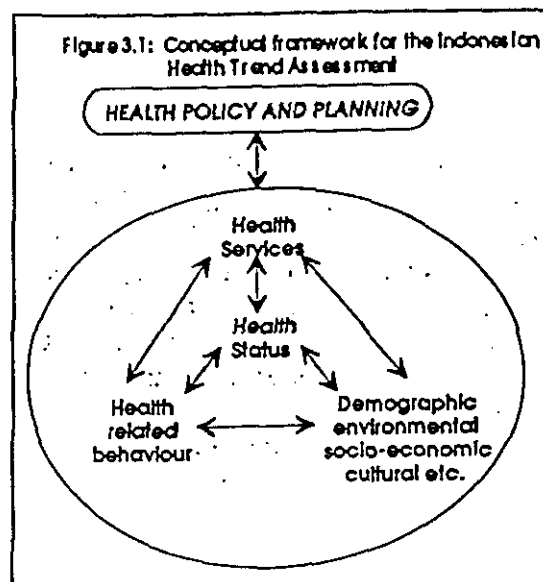
The trend assessment of health development in Indonesia

The study was carried out by a multidisciplinary team drawn from the Ministry of Health, other related ministries and the universities, under the leadership of the head of the National Institute of Health Research and Development. The study was assisted at various points by external consultants and by WHO.

The conceptual framework guiding the programme of trend assessment was based on the experience gained by the Ministry of Health in developing the health components of previous five year development plans. Figure 3.1 depicts this framework diagrammatically. The emphasis in the study was placed on systematically reviewing and analyzing the individual components in this framework and their interaction. Initially working groups were set up to carry out detailed studies in four of the areas shown in Figure 3.1, namely: health policy and planning; health services; health status; and general environmental conditions. The fifth area (covering lifestyle and health related behaviour) was added at a later stage.

As part of this work, scenarios were developed for different indicators of future health status in the country; the indicators included life expectancy, selected mortality, incidence and prevalence rates, and nutritional status. The methods used to produce the scenarios involved

a combination of trend analysis and projection, with expert opinion utilized in a structured way



(see below) to explore the effects of socio-economic factors, environmental factors, and health care system characteristics on health status.

Using the RACON (Rapid Assessment Consensus) method

Rapid Assessment Consensus, or RACON, is a scaling measurement system which harnesses expert opinion. It was used in order to analyse the components of each of the areas of study. It utilizes expert opinion to assess the relative importance of the effect of different components of the general and environmental conditions and the health care system (the independent variables) on health status measures (the dependent variables). In order to apply the method, 25 different components of the general environmental conditions were identified and 13 characteristics or factors in the health care system. Figure 3.2 summarises the different components used in the RACON process. The effects of these on ten specific health status indicators was assessed, as well as on a broader category of health policy indicators.

Figure 3.2: Dependent and Independent variables used in the RACON method

INDEPENDENT		DEPENDENT
Health care system components	Environmental factors	Health status variables
Community participation Maternal and child health service Health Centre Hospitals Nutrition programme Communicable disease control Environmental health Health Personnel Health Expenditure Drugs Health Service Management Intersectoral coordination Research and development	Population Geography Climate Water Forest Land Maritime Housing Transportation & communication Industry Mining and energy Urbanization Transmigration Agriculture Drinking water supply Human excreta Medical radiation Public places Tourism industry Environmental pollution Biological environment Ideology, political, social, cultural and religious- Economic Education Women's role	Nutritional status Life expectancy Infant mortality rate Child mortality rate Maternal mortality rate Crude birth rate Fertility rate Incidence and prevalence of disease Proportional mortality rate Health policy indicators

Influences were assessed separately for the past situation and for expected future influences. This allowed the experts to exercise their judgement about likely changes in the pattern of influence of the various components on the different health status measures. The procedure used is essentially a modification of the Delphi technique. Initial assessments were made by individual experts of the effect of each component on each health status variable in turn using a simple measurement scale relating to the assessed extent of influence (the measurement scale appears at the bottom of Figure 3.3). Results were then collated and re-circulated for any re-consideration of the assessments made, and assessments adjusted where appropriate. As an illustration of the type of results produced, Figure 3.3 shows a sample of the matrix relating factors in the environment to selected future health status indicators.

Implications of the case study

Results from the study were influential in shaping the Second Long-Term Health Development Plan (1994/95-2018/19), as well as the Sixth Five Year Health Development Plan (1994/95-1998/99). The results and the methodology have also been used for health trend assessment at province level. The study has also been important in sensitizing people to the need for trend analysis and the skills required to conduct it. Constraints were imposed upon the work by lack of availability of appropriate data in many areas, by limited availability of expertise, and by changes in the decision-makers involved with using the result, necessitating rebuilding of commitment.

Figure 3.3: Assessed influence of selected factors in the environment on future health status indicators

	Nutritional status	Life expectancy	Child mortality rate	Incidence & prevalence of disease	Prevalence of disability
Housing	-	3+	3+	3+	1+
Transportation & Communication	4+	-	3+	3+	4+
Industry	4+	3+	3+	4+	3+
Urbanization	3+	4+	4+	2+	3+
Transmigration	3+	3+	3+	2+	1+
Environmental Pollution	-	4+	2+	4+	3+
Education	4+	-	4+	3+	2+
Women's role	4+	3+	4+	3+	2+
Key: 4+ = very important influence, strong correlation 3+ = important influence 2+ = moderate influence 1+ = small influence - = no correlation/influence					

The study directly attempted to tackle the entire spectrum of factors that can affect health status. In a situation where data availability was limited, the structured method of soliciting and using expert opinion that was developed enabled this problem to be surmounted. Despite restrictions on the availability of data, the study still managed to include measures of health status other than those based on mortality data, namely measures of morbidity, disability and nutritional status. The participative methodology utilized in the Indonesian study is equally as relevant for use in highly developed countries.

Malaysia - the national health plan study

Since 1970, Malaysia has worked to a 10-20 year planning horizon in terms of its Outline Development Perspective Plans for the country, which are based upon national policy. Within the framework provided by these Perspective

Plans, five year development planning is carried out with *mid-term reviews* of each plan. The country is currently in its Second Outline Perspective Plan period (1991-2000) and implementing the Sixth Malaysia Plan from 1991 to 1995. Overall Malaysia has set for itself a 30 year time frame within which it will attain the status of a developed industrialised country by the year 2020.

Health status indicators for the country have been improving with steadily decreasing mortality and control of communicable diseases. Epidemiologically, the disease pattern is in a transitional phase from domination by infectious diseases and malnutrition towards predominantly noncommunicable disease. Health problems associated with environmental pollution, lifestyle and an ageing population need to be actively addressed, as well as the threat from HIV/AIDS. Health services are provided by the government, statutory bodies and non-governmental organizations, as well as by the private sector; the public sector is the

major provider. Private sector provision is concentrated in urban areas and has been growing rapidly.

Health planning in the country is undertaken within the context of national development planning. Capital development plans for health are prepared separately by the various health and health-related agencies for inclusion into the five year development plan. The Ministry of Health is the lead agency in planning for the health sector, and has a long history of planning activities, previously there had been only minimal planning by other providers in the public sector. The Ministry of Health's planning process is based on bottom up needs identification whereby the community's needs and demands are identified through situational analyses at state level, compiled into an analysis and projections of the country's health and socio-economic situation.

During the 1980s a number of significant health issues been to emerge which indicated a need for better integrated planning both within and between the public and private sectors. These issues included the uncontrolled growth of the private sector which led to problems of equity and the perennial inadequacy of public sector health personnel, as well as suboptimal resource use.

The national health plan study

In order to address the need for an integrated planning methodology, a National Health Plan Study was commenced in May 1990. The study objectives and major outputs are summarised in Figure 3.4. The study was carried out in two phases. The first phase

reviewed health planning methodologies in the public sector health organizations. Phase II, which concluded in December 1992, was concerned with formulating an integrated health planning methodology. The study was undertaken by foreign consultants with expertise in health planning, epidemiology, public health, human resources, health economics and information systems, together with local counterparts. The use of trend analysis and projection methods in the second phase of the study are outlined below.

The development of the Malaysia Health Plan was based on a wide range of work undertaken in order to formulate an integrated health planning methodology and produce a balanced health plan for the country to meet national policy objectives. The work was thus integrated with the country's national development plan.

National health programme planning

The overall planning process proposed by the study is depicted diagrammatically in Figure 3.5. Integral to the process is the use of the measure 'Days of Healthy Life Lost' (DHLL) for different diseases. This is (theoretically) a more comprehensive and sensitive measure than conventional mortality and morbidity indicators; the components of the measure are summarised in Figure 3.6. The planning process begins with a situational analysis to establish baseline DHLL values for the country.

The impact of future changes in the socioeconomic situation on future health status is assessed by first making projections of future levels of a number of socioeconomic

Figure 3.4: The Malaysia health plan study - objectives and major outputs

OBJECTIVES	OUTPUTS
<ul style="list-style-type: none"> - develop a national health planning methodology - carry out a trial of the methodology and produce a draft National Health Plan (NHP) - conduct a process evaluation - make recommendations to Government 	<ul style="list-style-type: none"> - national health planning system and methodologies - draft National Health Plan (NHP) - information system for NHP - training of personnel for NHP - training materials - preliminary NHP process evaluation - definition of resource requirements for NHP

factors. The starting point for this was the use of trend analysis and projections, which were then subjected to scrutiny by expert opinion (using focus group discussions and the nominal group technique), in order to produce modified projections where appropriate. The impact of these socioeconomic factors on disease risk factors was then assessed on a relative scale of -1 to +1, and these parameters were used to estimate future disease burdens in terms of DHLL. The effects of different intervention scenarios on disease burden in DHLL were estimated using similar methods of harnessing expert opinion to assess changes in risk factor levels and their effect on the different components of disease burden.

The process also envisages that estimates of future resource requirements will be produced for each disease by category of intervention, using available data in combination with expert estimates for: the units of resource required, including professional and support staff time; the cost of drugs and other supplies; and other operating costs. This can be developed to give a comparison of the cost-effectiveness of different disease interventions.

Figure 3.5: Macro level health planning process in Malaysia

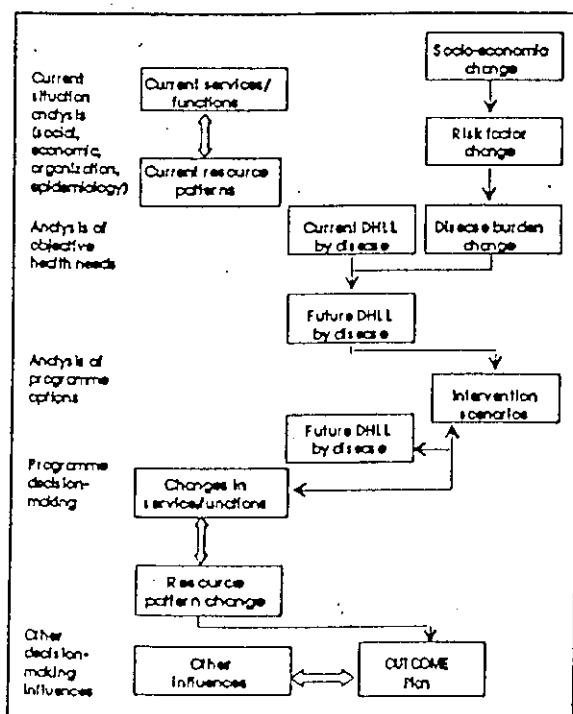


Figure 3.6: Calculation of days of healthy life lost (DHLL)

DHLL is calculated by a formula that adds together the number of days of healthy life lost due to four different aspects of disease. The four components are:

1. Days lost due to death;
2. Days lost due to disability before early death;
3. Days lost due to chronic disability;
4. Days lost due to acute illness.

A limited amount of scenario development was also undertaken to produce three different scenarios for the organization of the health system, and four different scenarios for the organization of national level health policy and decision-making.

Implications of the case study

The case of Malaysia, discussed above illustrates how studies on the macro-environment of health can be integrated with national development plans. It also illustrates that the health outcome variables used need not be restricted to traditional measures of mortality or life expectancy; more attention can be given to incorporating more sophisticated or positive measures of health and the 'days of healthy life lost' measure used in the Malaysia study provides one example of this.

The usefulness of the various different futures aspects of the study was reviewed during the presentation at the consultation. The DHLL results were not widely applied nor used for macro health planning. Major limitations were lack of data availability and consequent doubts about the measure's validity and precision. Given the substantial resource implications involved in the development of the necessary data, the cost-effectiveness of pursuing this approach needs to be examined before any further attempt is made to develop the information systems required. The use of scenarios was found to be particularly helpful at the macro-level; it was recognized however that the treatment of the scenario method had been quite superficial and that it would be

useful to carry out more work on the scenarios outlined.

The example of the National Health Plan Study in Malaysia illustrates how joint conduct of a study by external and local personnel can result in personnel development of local staff through successful transfer of knowledge, skills and technology. It is also notable for its method of utilizing expert opinion in combination with more conventional quantitative analysis.

Nicaragua - The construction of possible future health scenarios

Over a period of two years since 1991, the Government of the Republic of Nicaragua has vigorously pursued structural adjustment programmes, the political implications of which included significant modification of public and social policies. Expenditure on social and health sectors had been particularly affected, and the different sectors in civil society had not been capable of designing suitable measures to ensure the protection and promotion of health. The situation in Nicaragua during that time was characterized by economic, political and social instability, where society in general was still affected by: the trauma and socioeconomic impact of the postwar period; the failure to satisfy basic essential needs; the worsening and military complication of conflicts; and political mistrust. Such factors were considered to pose extremely grave threats to the implementation of short- and medium- health proposals, unless these could command widespread support across the political spectrum. Against this background, the use of a participative and consensual process for the construction of desired future visions of the health situation and possible health scenarios was considered to be particularly necessary and appropriate. The School of Public Health of Nicaragua, in cooperation with the PAHO/WHO country office in Nicaragua and with support from PAHO/WHO headquarters, has been involved in a programme of work to address these needs, the overall objectives of the work are summarised in Figure 3.7.

The work described here covers the early stages

Figure 3.7: Working towards the 21st century health system in Nicaragua

Overall objectives:

- design possible health scenarios emphasizing the organization of the health services in Nicaragua at the beginning of the 21st century, based on health situation and trend assessment;
- outline the implications, for the formulation and implementation of health policies; of the selection of a preferred future scenario by the social actors involved in the construction of a new health future for the country;
- initiate the process of systematization of the national experience in the design of future health scenarios to be applied in particular aspects of the organization of services, the development of human resources, and the analysis of specific health problems.

of this programme, concentrating particularly on the process by which the different social actors influential in the construction of a new health future for the country were involved in the formulation of alternative possible future health scenarios for the beginning of the 21st century, and in the selection of a desired scenario.

The process of building future health scenarios

The study started with a review of the social, economic and political instabilities and the

Figure 3.8: Health situation 1990-1992

- persistence of nutritional, infectious and communicable diseases
- poor living conditions
- lack of basic sanitation and safe water supply
- growing importance of chronic and degenerative diseases
- physical, mental and social disability engendered by civil war

Figure 3.9: Recent phases in the health situation in Nicaragua - background for national workshop

<p>First phase: 1979-1984</p>	<p>Period of rapid growth</p> <p>Coverage of health system under new Unified National Health System expanded, new facilities built</p> <p>By end of period, health system unable to adapt in face of imbalances caused by civil war</p> <p>Significant improvements in health status, e.g. reduction in infant mortality, resulting from preventive measures like immunization and health education</p>
<p>Second phase: 1985-1988</p>	<p>Strict limitations in food consumption due to high prices and reduction of subsidies</p> <p>Defence spending increases</p> <p>Efforts to halt deterioration of health services, including implementation of local strategic administration of services</p>
<p>Third phase: 1988-</p>	<p>Initial application of economic and structural adjustments</p> <p>Hyperinflation, e.g. rise in cost of basic food basket from 76.5% of average individual wage to 375.5% of average individual wage during 1988</p> <p>Unified National Health System on verge of collapse</p>

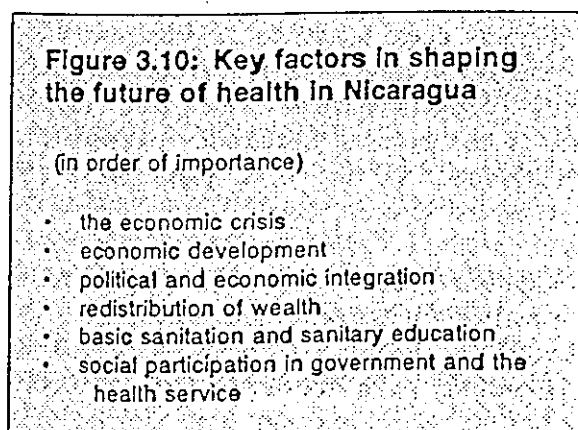
devastation of war. The results of the review were summarised in a paper covering the health situation and current organization of health services in the country, key results are presented in Figure 3.8 and 3.9. The review paper was used as the basic preparatory document for a national workshop, which brought together key persons: from the health institutions responsible for human resources development; professionals working in various political, social and economic national institutions; as well as officials from various multilateral, bilateral and nongovernmental cooperation organizations; and noted health personnel.

The individuals brought together at this first workshop participated in various activities which provided the basis for scenario design. The first stage in this process consisted of brainstorming sessions to generate answers to two questions:

- what do you believe to be the most important elements that will shape the country's health situation in the next 15 years?

- what do you consider to be the main current and future health problems?

The key factors selected by the group as being the most important in terms of shaping the future of health in Nicaragua were then ranked in order of importance, see Figure 3.10.



Drawing on the results of the brainstorming exercise, the participants then discussed the different variables that should serve as a basis for the design of future health scenarios,

according to their judgement, they suggested that they should be organized in the following four groups:

- the macroenvironment;
- the epidemiological profile of the population;

- institutional and community health practices;
- increase and reduction in the demand for health services.

Figure 3.11: Outcomes - selected elements from three future health scenarios for Nicaragua at the beginning of the 21st century

<p>Scenario 1: present situation maintained</p> <p>Socio-economic: High poverty, unemployment continue or worsen. No solution of problems of land ownership, traditional agriculture unable to be pursued. Inequitable distribution of wealth. Situation aggravated by unfavourable integration into Latin and Central American common markets and within continental block. Economic adjustment policies continue with adverse economic effects for large sections of the population. GDP growth 1-3%.</p> <p>Environment: health hazards increase, lack of sustainable ecological development</p> <p>Demographic: 2-fold increase in population, decrease in proportion aged <4, increase in proportion aged 65-80.</p> <p>Health status: Epidemiological profile dominated by infectious diseases coexisting with chronic degenerative diseases. High rates of accidents and violence. Significant mortality and morbidity due to environmental factors.</p> <p>Health services: Public expenditure decreases. Increased involvement of nongovernmental agencies in provision, with opportunities for them to take an active role in proposing alternatives for development of system, along with universities. Roles of public health system in stimulating, coordinating or leading health policy development diminish. Supply system grossly deficient.</p>
<p>Scenario 2: reform</p> <p>Socio-economic: Resolution of post-war problems. Land-tenure situation stabilized. Industrial development. GDP growth up to 5% per annum</p> <p>Demographic: as scenario 1 + implementation of population control policies begins.</p> <p>Health status: Dual nature epidemiological profile becomes more evident with infectious diseases coexisting with chronic degenerative diseases. Improved rates of accidents and violence. Mortality and morbidity due to environmental factors, including occupational diseases require action.</p> <p>Health services: Public expenditure increases. Reorganization of public health sector within framework of mixed, participatory, jointly managed and universal system of health services. Includes effective decentralization, and more effective incorporation of health promotion and community participation, and interaction with various traditional health care providers. Strengthening of university sector contribution.</p>
<p>Scenario 3: profound change</p> <p>As scenario 2 plus:</p> <p>Environment: Focused attention on achievement of sustainable ecological development. Ministry of Health to take role in assuring overall environmental protection.</p> <p>Health services: Individual to have free choice of provider and to become informed and active participant in decisions affecting his/her health individually and that of her/his community. Services to be organized in three levels (national, departmental and municipal), with functional integration of public (state or municipal), private, mixed, co-managed or cooperative services within each. Improvements in training and deployment of human resources for health. Role of universities strengthened in training, research, and especially in the production of appropriate technology for use in health services.</p>

Analysis was carried out to identify the different groups whose actions affect the health situation in Nicaragua, together with an assessment of the level of impact they have and whether this is favourable or not. The group moved on to share opinions and suggestions on the construction of three alternative scenarios: the present situation maintained; a reform scenario; and a scenario of profound change. Selected elements from these three scenarios are outlined in Figure 3.11. The final stage in the workshop was the selection, as a future vision of health or desired scenario for the future: the scenario of profound change.

Next steps in the programme of work

The three scenarios which resulted from the work described here are being used in later stages of the programme as the basis for the formulation of more equitable health policies and more efficient and effective health practices. One part of this is their use to involve the fifteen Nicaraguan political parties in negotiations about constructive action. Proposals for further studies to support the design and implementation of such action are now being formulated and will shortly be presented to the National Policy Forum in Nicaragua.

Implications of the case study

The Nicaraguan case study is one example of how the explicit use of scenario building to investigate a range of different futures can support the design of alternative health care systems. The participative methods used enable the experience and knowledge of key actors to be utilised effectively, giving special importance to group and qualitative analysis. The study demonstrates that these type of methods are feasible/achievable in difficult circumstances characterised by conflict and mistrust, most noticeable in the widespread participation across the political spectrum achieved in this case. The methods used are suitable for situations characterised by constraints of limited available resources and data.

Both the Nicaragua case study; and that of Pakistan which follows, illustrate an important role for the university sector, and in particular for Schools or Departments of Public Health, in forming partnerships with policy makers, both to carry out futures studies to identify desired and feasible scenarios, and also to carry out the necessary studies and research to support the implementation of measures to achieve preferred scenarios.

Pakistan - Building desirable and feasible health systems for the future

Pakistan is a populous country with strategic, cultural and economic ties to South Asia and the Middle East. As a developing country, Pakistan faces complex challenges, prominent among which are health and health-related problems. Overall life expectancy has improved over the period 1960 to 1990, but key mortality rates like infant and maternal mortality remain high. While 70% of the population live in rural areas where the government is the principal provider of modern medical care, only 35% have access to this care. The primary health care programme has prioritized communicable diseases and nutritional deficiency states affecting children, i.e. the pre-transitional diseases. The proportion of deaths due to childhood diarrhoea and immunizable diseases has decreased and more mortality is due to post-transitional noncommunicable diseases among adults. However, because fertility control remains elusive, the broad-based population pyramid suggests that considerable pre-transitional ill-health will remain and thus the country will have to deal with pre- and post- transitional problems simultaneously.

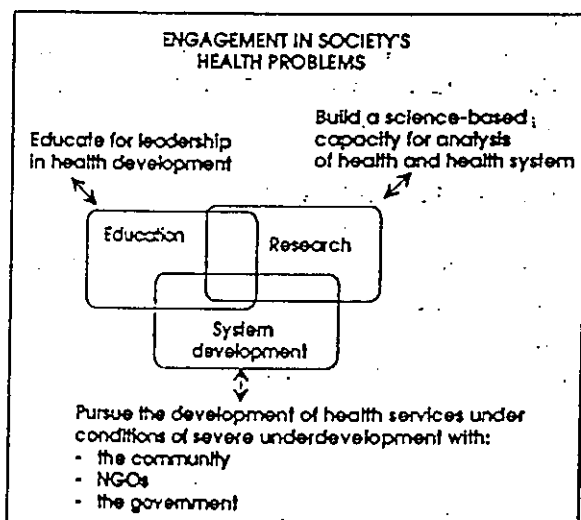
The case study from Pakistan is concerned with investigating prototypes through action research as a basis for future health system design. The work described is part of a continuing programme being carried out by the Aga Khan University, in partnership with government, to design measures for building a future that is both plausible and desirable. The work is guided by a set of ethical values, in support of goals of equity, effectiveness, affordability and

community participation, and is particularly aimed at the most vulnerable and underprivileged groups in the country.

Framework for collaboration in the design of future health systems

The Aga Khan University undertakes a wide programme of work in education, research and system development which is carried out in partnership with government and in direct response to society's health problems, see Figure 3.12. In the setting of Pakistan, where the potential for health system response to current challenges is seriously constrained, it was considered that undertaking elaborate approaches to futures studies could be severely inappropriate. Instead of devoting resources to routes such as the envisioning of a desirable but distant future, it was considered more appropriate to work through systematic exploration and evaluation of system prototypes to establish a basis for building future health systems that are both desirable and plausible.

Figure 3.12: Framework for Aga Khan University's health futures activities



Primary health care prototypes

The Aga Khan University has several urban primary health care (PHC) prototypes serving populations of about 10,000 each and a rural district prototype that relates to a million

people. The urban and rural prototypes share several common features. Community health workers (CHWs) are women recruited and trained locally, who each visit 100-125 households monthly. They are supervised by a health visitor, an auxiliary health worker with two years of technical training, who in turn is supervised and supported by a community health nurse. Some urban and rural systems rely on village volunteers with governmental or university support. The PHC teams work from an urban PHC centre or a rural Basic Health Unit, each with a suitable information system to track inputs, activities and results, see Figure 3.13.

The community health nurse acts as an epidemiological surveillance point for her field site, supported by community health doctors (junior faculty at the university). She acts to ensure that all households with children under 5 years of age are identified and visited monthly. In addition, the community health nurse identifies those at increased risk for special attention; for example pregnant women, malnourished children, ethnic minorities and young infants all receive special attention. Work is currently underway to explore a risk-scoring system for use in these settings. Work in the prototype projects is also undertaken to develop appropriate quality assurance procedures and training programmes. This includes supervisory checklists for CHW activities, which have been developed for use in support visits. Resistance to their use has been minimized by involving the workers in their formulation.

Figure 3.13: Monitoring prototype effectiveness: an example

	Infant mortality rate (per 1,000 livebirths)
Field sites with prototype system	126
Comparison sites:	
- low income	210
- high income	33

The results of the prototyping have included a 'micro-level' primary care system for urban squatter settlements where infant and child mortality have been halved, see Figure 3.14. The annual cost of this system was very low at US\$3.12 per capita per annum.

Figure 3.14: Effects of urban PHC system prototype

	Infant mortality rate (per 1,000 livebirths)
Prior to prototype implementation (1987)	126
After prototype implementation (1992)	74

Once successful service prototypes have been developed, they are then implemented on a wider scale. Besides the development of prototypes for 'micro-level' PHC systems, research is also being carried out by the university to support policy formulation and the design of implementation strategies for larger scale systems, including a front-line hospital. In carrying out this type of work the university works interactively in collaboration with government to design prototypes to answer the questions of interest to government and to provide guidance, based on research carried out into appropriate policy measures.

Implications of the case study

Like the Nicaraguan case study discussed earlier, the Pakistan case study illustrates an important role for the university sector, and in particular for Schools or Departments of Public Health, in collaboration with policy makers, to carry out futures studies to identify desired and feasible health system configurations. This case study is also notable for its approach in the use of 'back-casting' through action research to design systems that will contribute to building a future that is both desirable and plausible. The approach adopted is also highly

participatory in that it seeks to involve all levels of staff in prototype projects in design and evaluation activities, supporting these with any necessary education, training and supervision.

United States - a case study in the use of dynamic modelling

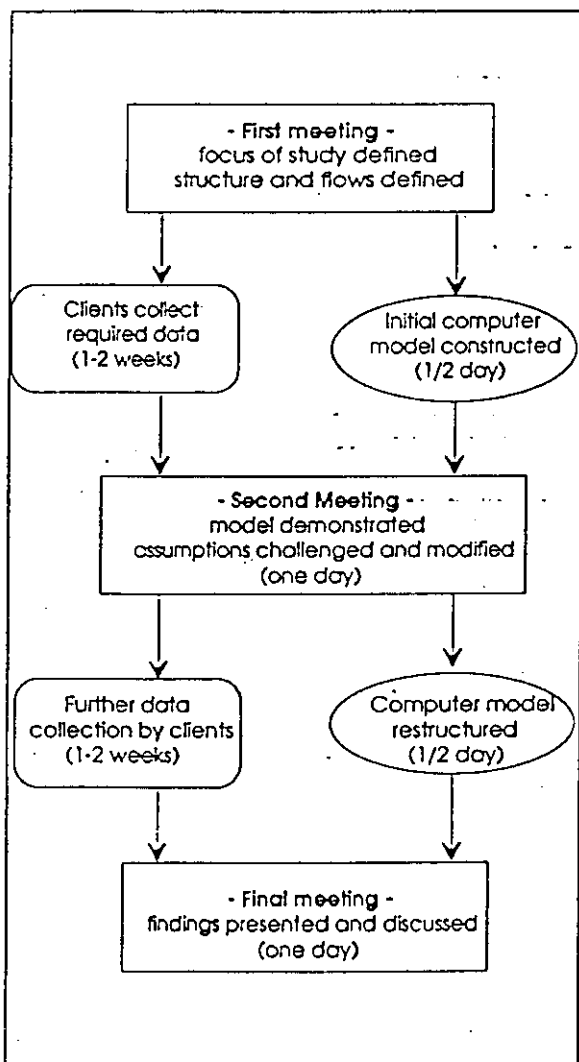
Nursing homes in New York care for over 100,000 people. The total costs of such care are large, mainly provided for by the State's Medicaid programme. In 1989, nursing home expenditures accounted for almost 30% of total Medicaid expenditure amounting to just short of US\$3 billion. In 1991, the State Governor was considering a new law which would limit Medicaid outlays by capping the fees charged to private patients in nursing homes. A provider organization, the New York State Association of Homes and Services for the Ageing (NYAHS), was concerned that this policy measure would harm their revenues, and also in the longer term act to shift the cost burden further onto Medicaid. NYAHS therefore commissioned a study of the nursing home system in order to evaluate the effect of the proposed new law and of two other policy alternatives: scenarios of Medicaid payment rate reductions; changes in the personal assets available and used by nursing home residents to pay for nursing home services.

Using systems dynamics models

Systems dynamic models provide a tool for simulating the behaviour of a system in order to make forecasts of its future behaviour, when one or more of the system characteristics changes. The technique draws on applied systems thinking and has its roots in the work of Forrester on the global models familiar from 'Limits to Growth'. Such models can easily be used to build up and explore alternative future scenarios. The technique explicitly recognises the dynamic nature of systems, and the possible existence of self-reinforcing and self-negating cycles or feedback loops, i.e. that when one variable is changed, the resulting changes in other parts of the system may have subsequent consequences for the original variable. Taking

account of these feedback effects enables policy options to be evaluated in a more comprehensive way than by a simple static 'snapshot' evaluation where it is assumed that if one variable changes, the resulting changes in other parts of the system will have no subsequent effect on the original variable itself. Easy application of the approach is facilitated by the use of one of a number of personal-computer based software packages that are widely available, and of relatively low cost. The case study described here used the STELLA II software package.

Figure 3.15: Systems dynamics project timescale



Building a systems dynamics model for nursing homes

The overall schema followed during the project is shown in Figure 3.16. The initial project meeting with NYAHS staff served to narrow the focus of the study from over 500 nursing homes in 14 areas to the idea of exploring the consequences for a single 'generic' home. The expertise and art of the systems modellers involved was important in enabling this sort of focusing to take place. During this first meeting the dynamic nature of this generic home was explored and the issues involved and the structure of the system drawn out as flow diagrams. Basic data requirements about critical rates of flow of people through the system were identified in order that the necessary information on actual flows and associated financial data could be collected. During the second meeting the initial computer model was demonstrated and its behaviour explored and discussed leading to the challenge and modification of assumptions and structure where necessary. The revised structure was drawn out and agreed, and further data collection requirements identified. At the final meeting the results from the model on the consequences of the different policy alternatives that were investigated were presented and discussed, see below.

Exploring different policy scenarios for nursing homes

Figure 3.16: The policy options explored

1. Reduction in Medicaid payment rates
2. Set upper limit to private fees
3. Increase in level of patient assets available for spending in nursing home care

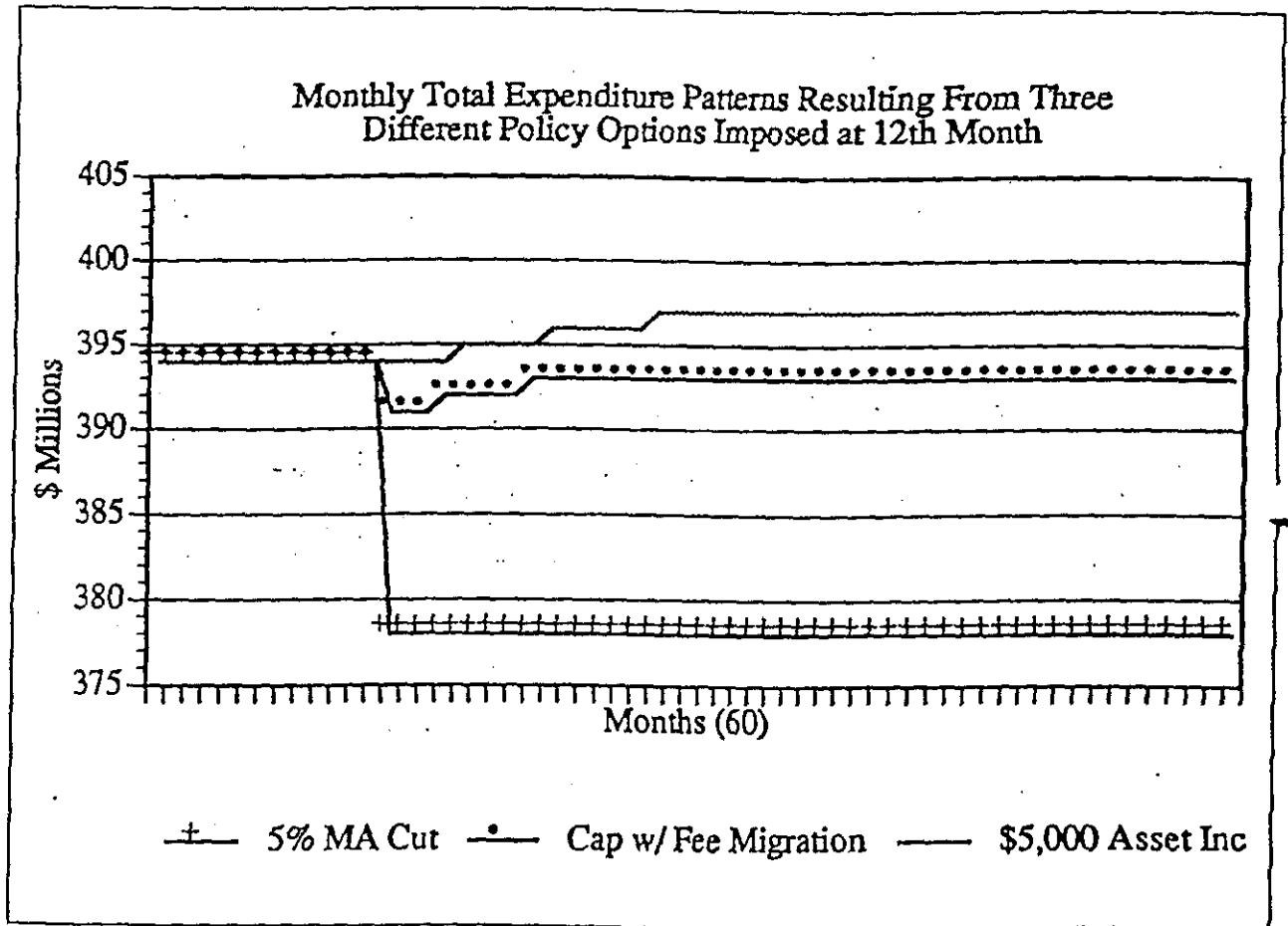
The three different policy options explored using the model are summarised in Figure 3.17. The model explored the effects of each of these, and various combinations, on overall

nursing home revenues and Medicaid spending over a five year period following the introduction of change some of the results are shown in figure 3.17.

As an illustration of the use of the model, consider one option, which was the one being considered by the State Governor. The rationale behind this was that setting a upper limit or cap to the fees charged to private patients in nursing homes would lengthen the period of time that individuals could support the costs of their own fees, through private insurance cover (usually available for no more than a nominal amount of nursing home care)

or use of personal assets, and thus delay the point at which personal assets had been spent or divested to the point at which they became eligible for Medicaid. The results from the model showed that, counter to the prior expectations of the NYAHS, a relatively small, permanent, reduction in Medicaid expenditures would be obtained. However, this conclusion was dependent upon where the upper limit was set relative to the Medicaid rate, and on the accuracy of information available on private pay fee rates. The model was also used to explore the implications of: private pay fee rates being different from those estimated from available data; possible changes

Figure 3.17: Effects of Options on Medicaid costs and total nursing home revenues



Source: *Using a Dynamic Systems Simulation to Project the Effects of Three Policy Options on Nursing Home Revenues and Medicaid Spending*, J.W. Rodat and M.A. Moldaver, May 1991

in the fee setting behaviour of those nursing homes with rates below the cap level.

Explorations with the model also demonstrated that option 3, an increase in level of patient assets available for spending in nursing home care, would produce significantly more Medicaid savings and more revenue to nursing homes than option 2. Option 1 resulted in Medicaid savings and reduction in nursing home revenues. The model provided convincing evidence that NYAHSAs' original expectations about option 2 were not supported in all circumstances. Owing to the involvement of the client in building and testing the model, they understood why these expectations were not supported and also had confidence in the model's results. The model enabled them to move on to test new theories and to examine other possible solutions which had not previously been under consideration.

Implications of the case study

The case study illustrates how systems dynamic models can be used to provide a flexible tool which simulates the behaviour of a system in

order to make forecasts of how it will behave in the future, when one or more of the system characteristics changes. Such models can easily be used to build up and explore alternative future scenarios. Since the model explicitly examines the dynamics of the system, its use enables policy options to be evaluated in a more comprehensive way than by a simple static 'snapshot' evaluation.

The study demonstrated several advantages of the approach. Firstly, the possibility of involving the client fully in the design of the model, leading to acceptance of model and its results (even when these proved to run counter to the client's original expectations). Secondly, there was the very short elapsed time (one month) between initial meeting and completion of the project, (Figure 3.16), demonstrating the ability to conduct rapid investigation using this type of method. Limitations of the approach include dependence on the expertise and art of the systems modeller, in particular in constructing a model that strikes a balance between including too much detail and neglecting or oversimplifying significant interactions.

PROSPECTS FOR HEALTH FUTURES

Introduction

The last two days of the consultation were spent in examining the potential of Health Futures studies and how this might be developed. With a common background provided by the review of Health Futures studies carried out during the first part of the consultation, the meeting addressed the last two objectives of the consultation, namely:

- to assess the apparent usefulness and impact of these studies and the appropriateness of the study methods for broad dissemination and use in support of the new public health action (part of this objective was directly addressed in the earlier discussions in the meeting reported in Chapter 2);

- to generate new ideas on how to foster practical, useful health futures studies and research, sharing the methods with Member States, especially developing countries.

This was done in two stages. In the first, participants worked in facilitated small groups and undertook an illustrative design exercise to identify what the features of a health futures system might look like five years from now for a specific country, chosen from amongst those of the group's members. Each group focused particularly on one of the four domains of action comprising the policy directions for WHO's Ninth General Programme of Work (see Figure 4.1 for details). In the second

Figure 4.1: Illustrative Design Exercise for a Health Futures system

Task: You are the consulting team assembled to design the health futures system for country X, to assist the country to think and act more creatively and effectively to achieve health for all, specifically in the area of Y. Describe the system, including the tools, processes and participants.

Group	Country (x)	Policy direction/domain for action (y)
1	Indonesia	Health and human development in public policy - health and socio-economic development - policy analysis - public policy and health - population and health
2	Nicaragua	Access to health services - alternative health systems - health resources (manpower, finance) - assessment of future requirements and demand
3	Pakistan	Health promotion and protection - determinants of health (environmental, social, behavioural) - services for protecting vulnerable groups
4	Slovakia	Prevention and control of priority health problems - health trends/surveillance - priority setting - technology development - preventive/curative interventions

stage, following presentations on some proposals for activities and projects in the health futures field generated within WHO and by the participants in the meeting, work was again carried out in facilitated small groups, to discuss the different proposals in the light of one of four types of action (see Figure 4.4 for details).

The remainder of this chapter is in two sections, dealing with the outcomes from each of these two stages in turn.

Illustrative design exercise -

What should a health futures system contain?

A number of common features for health futures systems emerged from two or more of the four groups; the meeting considered these characteristics to be appropriate and desirable in all countries and for all domains of action. These are summarized in the first section that follows. The outcomes from the work carried out by the small groups, together with the plenary discussions, illustrated many different ways that Health Futures can provide vital support for the achievement of the four policy directions of the WHO Ninth General Programme of Work within individual countries. While the entire spectrum of different futures tools and approaches has a potential role to play for each of the four domains of action defined by these policy dimensions, the subjects to which they would be applied vary, these outcomes specific to the different policy directions are discussed in the later part of this section.

Common features of a health futures system

It was readily apparent from the reports of the four working groups that there were a number of features of the health futures systems designed that were common to more than one country and each of the four domains for action; these are summarized in Figure 4.2. The plenary discussions confirmed that these represent features that can usefully be thought

of as desirable characteristics or capabilities for any health futures system. The relative importance of each of these would vary according to the particular local context, including the domain of action under consideration.

Figure 4.2: Common features of a health futures system

- integral to the policy-making process
- health futurist expertise available at all levels
- scanning activities: present, prospective
- 'intelligence function': converts data to information
- use of some type of visioning process
- enables widespread participation
- transferable futures tools
- suitable databases

Firstly, there was the recognition that a health futures system needs to be integral to the policy-making process. Secondly, that health futurist expertise should be available at international, national, regional and local levels. Scanning activities are also important. Two types need to be considered: firstly dealing with the analysis of past and present databases; secondly, covering prospective scanning, both in terms of extrapolation of long-established trends and analysis of emerging issues. This was an area where the availability of suitable, accessible, international networks could help countries, and particularly developing countries, to carry out these functions.

The next common feature was the need to incorporate what was referred to as the 'intelligence function' within the system. This represents the capability to convert data to useful information and insights, and to help ensure that the system does not merely assemble data and make it accessible. The need to move beyond trend analysis was also considered to be important, with the use of some type of visioning process to ensure that desirable future(s) are considered, and that attention is not limited to extrapolations of business-as-usual. Strongly connected to this was the next common feature, the need for a

Figure 4.3: Summary of reports from illustrative design exercise

<p style="text-align: center;">GROUP I Integrating Health and Human Development Indonesia</p> <ol style="list-style-type: none"> 1. Undertake an integrated approach to visioning, using search conferences, surveys, (public involvement at all levels). 2. Evaluate existing planning methods and techniques. 3. Intelligence units which perform trend assessment, identify emerging trends, and monitor the effects of social development on the health sector. 4. Combine 1 to 3 in alternative scenarios. 5. Integrate into a long term national and regional planning and policy-making process, through involvement of coordinating ministries. <p>Stress importance of intersectoral teams for health assessment, which should be institutionalized.</p> <p>"Redefining HEALTH as the centre of energy"</p>	<p style="text-align: center;">GROUP II Ensuring Equitable Access to Health Services Nicaragua</p> <p>A system that benefits from :</p> <ol style="list-style-type: none"> 1. a network of international support 2. national leadership 3. local and stakeholder participation <ol style="list-style-type: none"> 1. "International" support includes: <ol style="list-style-type: none"> a) International Health Futures Network; b) Handbook on Health Futures methods and design; c) A system for evaluating futures tools; d) Access to global data (PAHO/WHO, WB, IDB). 2. "National" includes: <ol style="list-style-type: none"> a) Futures inputs to national policy making; b) Alternative scenarios of health futures; c) Forecasting of: technology, therapies and delivery systems (and comparative efficiencies); d) Enhanced data and monitoring system; e) Processes for visioning; f) Parliamentary and local government futures groups; g) Participation from stakeholders. 3. "Local" includes: <ol style="list-style-type: none"> a) Community visions and assessment of forecasts in relation to community values; b) Integration of art, religion and culture for enhancing understanding of future possibilities, community pride, and mobilization for action.
<p style="text-align: center;">GROUP III Promoting and Protecting Health Pakistan</p> <ol style="list-style-type: none"> 1. Tools and Techniques <ul style="list-style-type: none"> - Environmental scan - Project future health status and model alternatives - Define wild card scenarios. - Simulate impact of personal lifestyle changes on health - Simulate impact of macro-environment and intersectoral effects on health. - New tool(s) needed for broad participation in defining vision and values. <ul style="list-style-type: none"> Caveats: - need more focus on values, - need to be more inclusive, - note lack of data for modelling. 2. Process <ol style="list-style-type: none"> a) Involve stakeholders throughout (public, private, internal and external) and use their data; b) Requires some minimal resources to see the project through; c) Strengthen management and information (data) systems and use surrogate data obtained through tools such as delphi approaches; d) Get into the community; e) Employ ongoing evaluation; f) Translate vision into broad health goals. <ul style="list-style-type: none"> Caveats: need to build in flexibility, to be comfortable, to use facilitators, training. 	<p style="text-align: center;">GROUP IV Preventing and Controlling Specific Health Problems Slovakia</p> <p>Priority approaches expected to be in place:</p> <ol style="list-style-type: none"> 1. Trend-assessment - including a priority setting database with better behavioural and health aspects over a long-term historical perspective. 2. Broad-based Steering Committee on health futures - including intersectoral support to decision-makers, enabling community input. 3. Widespread access to global computer networks enabling exchange of data and information on successful intervention: including community action 4. Bioforecasting - A comprehensive health and determinants database, combined with analytical ability. 5. Use of virtual reality techniques for production of alternative forecasts and visions (computer-supported). 6. Use of environmental scanning for identifying emerging possibilities and risks (group process).

system that enabled widespread participation, which could incorporate local level participatory activities, and motivate and involve all relevant stakeholders within a broad integrative framework.

The next characteristic was the need for transferable futures tools to be available and widely disseminated; independent evaluation of the advantages and disadvantages of individual tools and widespread dissemination of this information was stressed as important. Finally there was the importance of establishing and maintaining suitable databases. It was emphasized that in some circumstances it might be appropriate to undertake activities to recover/construct a historical data base retrospectively.

Other considerations

The four groups tackled the task in rather different ways, which was reflected in the content of their reports back to the plenary session, see Figure 4.3. This section summarizes some other considerations arising from the reports and the plenary discussions, some of which result from differences of view within the group.

Some elements were raised in the reports from only a single group, but were highlighted by plenary discussion as being of more widespread relevance. The first of these was the importance of training and education in supporting and developing the capacities of countries to set up and use health futures systems. The integration of culture, religion and art into thinking about the future is also important. Another important element was recognition of actual, or potential, conflicts of interest (the influence and interests of corporate capitalism being a case in point), requiring a clear focus on the needs of the most vulnerable groups in order to adhere to the principle of equity. Closely connected to this were concerns with the need to constantly raise the profile of ethical issues within futures studies (see also Chapter 2), and in particular the importance of recognizing that a concern with equity will justify the provision of some

services which may not be the most cost-effective, but whose provision will lead to reduction of inequities.

One of the possibilities mentioned by one of the groups was the use of tools for the production of alternative forecasts and visions based on virtual reality; some concerns were expressed however about the desirability of such a technological approach (assuming its availability) compared to more people-centred processes for generating forecasts and visions. Other new technologies suggested as promising potential new tools for use in futures studies were behavioural shells for use with the Delphi technique, scenario building and consensus building.

Some illustrations of the potential contribution of health futures to different policy directions

While the entire spectrum of different futures tools and approaches has a potential role to play for each of the four domains of action defined by the policy dimensions of the WHO's Ninth GPW, the subjects which they would be applied to vary; outcomes specifically relevant to the different policy directions are discussed below. This is not to suggest that the illustrations given below form four mutually exclusive sets. There is overlap and interaction between the four policy directions, and this is reflected in the fact that some of the topic areas for study appear under more than one heading. Common to all of these policy directions however, is the observation that health futures studies can make an important potential contribution to challenging and changing preconceived ideas, attitudes and beliefs, stimulating creative thinking in support of the goal of Health for All.

Health and human development

The futures tools specifically discussed in connection with policy development and action in support of health and human development were visioning, scanning (including trend analysis), and scenario development. Below,

each of these is considered in turn, in order to illustrate the particular elements and issues that these tools can be used in connection with.

In order to develop an integrated approach to aid policy development in this area, the starting point suggested by the group was a series of activities designed to produce a widely shared vision of the desired future in terms of health and human development. Given this specific policy direction, the topics covered in the vision process would include health, the different sectors in society, and the role of government. In order to make this a process with widespread participation, it was suggested that the visioning process should start from the community and work upwards, using tools like forums and search conferences. As well as representation from local communities and NGOs at all levels in this process, representation from different sectors would be particularly important here, given the policy area being tackled, in order to build a strong commitment to intersectoral action at later stages through the building of a shared vision for the future. Particular advantages of the vision process were considered to be its ability to help match community needs and desires to national plans and to help re-create policies.

Scanning, both in terms of trend analysis and emerging issues analysis, was felt to be important in terms of tackling several different specific subjects. Firstly there was the use of Delphi or modified Delphi techniques to analyze the important subject of new technologies and their potential impact. Other areas where it was important to identify emerging trends were the impact of new industrial plants and the effects of socio-economic developments (including political developments) on health.

Scenario development would take place by integrating the outcomes from visioning and scanning activities with relevant inputs from existing planning methods and techniques in order to generate feasible pathways in the direction of the desired futures which emerged from the visioning process. Progress against these scenarios could then be monitored.

Another suggested area for scenario development and monitoring is to explore the contribution of health to other sectors and thus to development in general, i.e. to explore the notion of health as investment and to exemplify how, viewed in the long term, the health sector can be seen as a productive sector.

Access to health services

Relevant futures tools discussed in connection with this domain were visioning, forecasting (including scanning), and scenario development. The role of visioning processes in this instance would be to explore desired future configurations of the health service system which would facilitate access to services. Specific topics that could be covered would include: the division of services between different settings (hospital, health centre, community) and how the community can be placed at the centre of this; how the division of services between settings would change for different types of service (e.g. health promotion and health development, prevention, medical care, rehabilitation); the operation of referral systems and the nature of gatekeepers to the system. It was suggested that the visioning process would be carried out at national and community level, and should aim to integrate art, religion and culture, in order to enhance understanding of future possibilities, to support community pride and to assist in mobilizing commitment for action.

Forecasting (including scanning) would be required to address topics of trends in health technology, in therapies, delivery systems and their comparative efficiency and effectiveness. Such forecasts, put together with community assessments of forecasts in relation to community values, could be used to help identify elements that should be incorporated within the health service system to facilitate access to services. Trend analysis would be required to examine past performance of the system in terms of health status and access to health services, (this presupposes the existence of the necessary local databases), and would form a part of a monitoring system to track future progress.

Scenario development could incorporate examining feasible ways of altering the health system to attain elements of the system envisioned, providing the basis for setting up specific targets for policy implementation. Scenarios could also be used to identify specific research needs.

Health promotion and protection

The futures tools discussed in connection with policy development and action in support of health promotion and protection were visioning, scanning, projections and scenario development, incorporating modelling and simulation approaches. Topics to be addressed through the use of a visioning process included: participatory workshops held within communities on future health status; what sort of society and conditions would be good for health; the desired re-distributions of decision-making power. The results from this process could then be translated into broad health goals. A parallel process might involve facilitating other sectors in thinking about the impact they might have on future health.

The specific contribution of scanning would include the identification of trends in risk factors, both long-established, and emerging, trends. Simple projections of future health status were suggested, but it was considered that more benefit would be likely to be gained from more complex modelling or simulation approaches. Three different possibilities were suggested. The first was a local level user-friendly model, which would enable exploration of different scenarios about the influence of personal lifestyle factors on health, perhaps also developed into an interactive health promotion game for use within the community. The second was an intersectoral model at national level to examine scenarios about the influence of socio-economic factors (both within the country and internationally) on future health status. The third suggestion was a model for exploring scenarios about future health status under the impact of changing risk factors and alternative interventions.

Prevention and control of priority health problems

In connection with this policy direction, the futures tools specifically discussed were visioning, scanning, trend assessment and scenario development, incorporating simulation approaches. The role for environmental scanning was to identify emerging possibilities for intervention and risk factor changes.

Trend assessment would be applied to behavioural aspects related to the health problems of concern. A more ambitious possibility would be the utilization of a model based on the bioforecasting approach to enable simulation of different possible future scenarios about health and its determinants. This would involve the use of very detailed information, based on the health condition and health records of individuals aggregated to give a picture of the whole health care system.

There was also strong support for broad access to international computer networking to facilitate the exchange of information on successful interventions and types of community action.

NEXT STEPS: POTENTIAL ACTIVITIES AND PROJECTS IN THE HEALTH FUTURES FIELD

In this section the outcomes from the small group discussions are summarized under the four headings for different types of action set out in Figure 4.4, plus an additional section which deals with those issues not fitting clearly within the earlier subdivisions. Some of the suggestions are relevant to more than one subsection; this is indicated when they are discussed.

Enhancing futures studies

The specific suggestions discussed which fall under this heading are summarized in Figure 4.5.

Figure 4.4: Exploring the next steps

Task: Generate new ideas on how to foster practical, useful health futures studies and research, sharing the methods with Member States, especially developing countries

Group	Type of action considered
1	Enhancing futures studies
2	Strengthening WHO cooperation with Member States
3	Efforts to promote networking activities
3	Support to health futures research

The suggestion that received most support as being an important need, from both the discussions in this session, and in other parts of the consultation, was the production of a handbook for health futures. The aim of this would be to provide health professionals and policy makers, at both national and local levels, with the basic information they need to apply futures tools in their work. The proposed

contents for such a handbook included three rather different components. The first of these would cover futures studies, designs, purposes, taxonomy, terminology, descriptions of tools (techniques and processes) together with their appropriate applications, and discussion of ethical issues. A second component would be information on how to access resources to help carry out a futures study, including relevant data, tools, knowledge, people with specific types of expertise, and relevant networks. A third component would include examples of health futures studies of various sorts. It was suggested that such a handbook could be produced by seeking contributions from experts in the field, edited to ensure overall internal consistency in use of terminology and style. It was also suggested that it would be valuable to set up a small advisory group, with members from users and potential users, particularly in developing countries, in order to provide appropriate direction and assistance to the team of authors. Appropriate mechanisms for pilot testing the handbook would have to be designed, as well as ensuring its translation into relevant languages. The existence of such a handbook would be an extremely important mechanism for supporting the development of health futures activities at all levels in Member States.

Figure 4.5: Enhancing futures studies - specific suggestions

- Production of handbook on 'Futures Research Designs and Methods for Health Futures Projects'
- Training workshops on health futures for Member States (national, regional and local levels)
- Training for facilitators of Healthy Community Vision Workshops
- Facilitate health futures fellowships
- WHO should support one or more national 21st century studies, using health as outcome variable
- Carry out futures study on international comparison of dental health care systems

The provision of training and education is also important in supporting health futures studies within Member States. There were three specific proposals in this area. The first of these was the provision of training workshops for Member States, at national, regional and local levels. These would be aimed at raising awareness of health futures and the potential usefulness of such activities in policy making and health development at different levels; these could be linked to the use of the handbook discussed above. Such training workshops would need to be adaptable to local conditions (and linked to relevant local activities, so that a learning-by-doing component could be included), and would require evaluation of their effectiveness. The second, related, suggestion is for a particular type of training workshop, aimed at training facilitators for visioning workshops at

community level. This type of training is particularly relevant for carrying out the sort of local level participatory studies that were identified earlier in the consultation as an important component to feed into health futures studies in support of policy-making. The suggestion, described later, for a database available through an electronic network, containing information on training opportunities is also relevant, and would aid in setting up health futures fellowships. These would be an important means of strengthening the capacities of countries to carry out health futures activities, and of facilitating the dissemination of knowledge and skills, with the possibility of linking these to specific projects and studies. This is an area where a suitable mechanism already exists which could meet part of the need, namely the WHO fellowships scheme; other funding possibilities might also be sought. The related area of student exchange between academic institutions with established courses might also be pursued.

The other two suggestions under this heading were for the execution of specific types of studies. Noting the lack of national futures studies which had focused on health as an outcome variable, it was suggested that WHO should consider supporting one or more national 21st century futures studies that would take this focus, in cooperation with other international agencies such as UNDP, UNESCO or the World Bank. This would provide an opportunity to explore alternative development paths that would support the achievement of Health for All. As well as developing the specific new studies, this would assist in demonstrating how a specific health focus could be added to existing national 21st century studies, emphasising the important links between health and development.

Strengthening WHO cooperation with Member States

Figure 4.6 summarizes the different suggestions which contribute to strengthening WHO cooperation with Member States. In addition to the items considered here, many of the networking activities discussed in the next

section also have an important role to play.

The first suggestion contained in Figure 4.6 was for the utilization of the existing network of WHO collaborating laboratories, together with coordination by WHO, in order to implement a global surveillance programme to identify emerging infectious disease. The network of collaborating laboratories that exists is well placed to recognize new diseases and has the capability to undertake the necessary activities, provided that improved communication between collaborating centres and improvements of technical surveillance capabilities in some countries could be provided. The information produced would be of global relevance. The second suggestion was for a more thorough utilization of the potential of Geographical Information Systems (G.I.S.) in the field of health. These can be used at a variety of levels to explore geographical inequalities, for example in disease occurrence, and in the availability of health services. One very specific application would be in communicating the results of the surveillance programme covered in the previous suggestion.

Figure 4.6: Strengthening WHO cooperation with Member States - specific proposals

- Global Surveillance Programme for identification of emerging infectious and viral disease
- Use of geographical information systems (G.I.S.) for assessment and monitoring of geographical inequalities in health care delivery systems and disease occurrence
- Monitoring New Technology in public health
- Establish system for registration and monitoring of available and transferable technology by category
- Facilitate proactive technology assessment in national health policy and programmes
- Encourage and support health futures activities, especially in developing countries

The next three items in this area are all concerned with technology. The first was a specific suggestion for activities to assess, for the different programmes with which WHO is involved, emerging technologies and their likely impact, as well as areas where technological breakthroughs were needed. It was suggested that if undertaken, this might be done on a pilot basis initially, with specific evaluation of the usefulness of the resulting information in programme management, policy formulation and funding, both inside and outside WHO. A wider proposal to establish a system for registration and monitoring of available and transferable technology by category was also suggested. It was suggested that it would be useful to carry out such activities on a widespread basis to permit early identification of all emerging technologies with potential impacts on health and health services, together with assessment of their transferability. Databases containing information on the assessment of such technologies once in use would also be valuable. It was mentioned that some specific proposals in this area are already under preparation, with the aim of seeking funding from the EC, amongst other sources. The third proposal in the area of technology, that of facilitating proactive technology assessment in national health policy and programmes, should be considered alongside the earlier suggestions.

The final suggestion was that of encouraging and supporting health futures activities, especially in developing countries. Ways should be found to provide appropriate support to assist developing countries in carrying out health futures studies. This will obviously also be reinforced by the suggestions considered above in this section as well as by some of the suggestions dealt with elsewhere, for example by the provision of a health futures handbook, and by the various suggestions on training and networking.

Efforts to promote networking activities

The suggestions which are particularly concerned with efforts to promote networking

activities are shown in Figure 4.7.

Figure 4.7: Efforts to promote networking activities - specific proposals

- Create globally accessible and continuously updated "information and knowledge" network concerning: health futures tools; programmes; training opportunities; technologies; etc. as well as open forum for results, answers, and open questions

Other items mentioned which might be a component or subnetwork of the above:

- Create network of those working in the field of futures and women's health
- Set up health futures research network
- Set up scientific and advisors networks within IHFN
- Creation of electronic network for dissemination of learning from studies of Future Health Systems

All of the proposals in this section are concerned with the creation of various networks, functioning to facilitate the exchange of information, experience, knowledge and contact between individuals or groups. Much of the discussion focused around the creation of electronic networks, utilizing e-mail and bulletin boards. In considering the various suggestions outlined below it is important to recognize that access to the technology to support such electronic networking is currently not equally available throughout the globe. In taking forward any of these suggestions therefore, specific provision needs to be made to enable access to the network contents to be gained by those currently without the necessary technology. This could involve finding means to widen access to electronic networks and/or use of other media such as distribution of regular network newsletters etc.; WHO has a specific role to play here, as well as the International Health Futures Network.

The first suggestion, which can be viewed as

subsuming all the others within it, was the creation of a globally accessible and continuously updated 'information and knowledge' network. This could include information on: techniques and processes for conducting health futures studies; health futures programmes; training opportunities; health technologies and their evaluation. An open forum for exchange of views, results, and to enable debate on open questions could also be incorporated. If at any point such a network were to become truly accessible throughout the globe, (and this is certainly not currently the case for any electronic network), this could be regarded as supplanting the need for the handbook discussed earlier.

The remainder of the suggestions amount to views on specific components or subnetworks that would be useful. Two project ideas are each concerned with identifying a group of people with interests in specific areas, namely futures studies examining issues of women's health (an area where PAHO is already active), and those interested in health futures research. Another suggestion was for the creation of networks or subnetworks of scientists and advisors within the IHFN; this could be used as a resource enabling potential users of health futures studies to contact people with specific types of experience.

The final suggestion, relating to work on a specific topic, was the creation of an electronic network by the IHFN for dissemination of learning, about both methods and findings, from studies of Future Health Systems, and in particular on major national or local health system redesign efforts. This might be explored through a pilot stage involving a small number of studies carried out in different countries. A first step would need to be the design of the elements or categories of information that would be included for each study; this could then be refined through electronic discussion.

The discussion emphasized the possibilities for starting work in this area through suitable small scale efforts, some of which might be hosted by WHO, either globally or in regional offices.

Particular items suggested as suitable for such pilot efforts were a database of information on futures training opportunities, resources and networks on a regional level for those involved in health futures studies. Strong interests in this were expressed from both Asia and the region covered by PAHO, where this could be developed from PAHO's existing health futures programme.

Support to health futures research

Figure 4.8 presents the three suggestions which particularly contribute to the support of research into health futures. In addition, some of the suggestions about networking considered above would also support health futures research, as would the proposal for national 21st century

Figure 4.8: Support to health futures research - specific proposals

- Establish a project to research transitional health technologies for development
- Conduct futures studies to design decision making structures for health improvement through public health
- Support the research assessment of, and education on, traditional medicine

studies focusing on health.

The first suggestion was for the establishment of a specific project to research transitional health technologies for development. The rationale behind selecting this as an important subject for research was that it is likely that the specific health technologies which are appropriate may change at different levels of development. Evolving technologies could be regarded as finding 'niches' at specific levels of development, and it would be important to gain understanding of this as a dynamic process in order to better inform the choice of appropriate technology for use in specific contexts. In carrying out any such project, it would be necessary to avoid any assumption of the

existence of a singular 'natural' path through different levels of development, and to explicitly investigate alternative development paths.

Secondly, there was a proposal for futures studies to investigate suitable decision-making structures for health improvement through public health; the IHFN already has a related project on 'the future of public health'. In support of the new public health action, it would be particularly useful to undertake a futures study which would aim to address questions of the possible new models of government function, and the relationship or balance between public and private roles in achieving the goals of the new public health action.

The final suggestion was the development of specific support for the research, assessment of, and education on, traditional medicine. This is important both as a subject in its own right and as a component to be incorporated within health futures studies. There is a need to ensure that health futures studies do not focus narrowly on allopathic medical care, and that they investigate a full range of alternatives.

Other possible next steps

This final section covers a number of proposals which do not fit easily into any single one of the four categories considered above. The rationale for all of these suggestions arises out of the general conclusion of the meeting, that futures studies have a potentially important role

to play in stimulating creative and effective public health action which will contribute to meeting the challenges awaiting us in the future in seeking to move towards health for all. For this reason it was considered important to raise awareness of health futures tools more generally. Thus, in addition to the suggestions raised earlier, it was also suggested that schools of public health should cover health futures tools as a part of their curricula. This would increase the potential for building up networks of centres with expertise in health futures, together with the possibility of their offering more widespread training and support, and carrying out health futures research.

Health futures tools are not only relevant for use within Member States, but they also have a potential role to play in the decision-making processes involved in WHO's own policy making and planning. Thus there was a specific suggestion that health futures tools should be applied as part of the regular WHO cycles of planning and policy review.

Connected to the discussion above and to the aim of supporting and facilitating the development of health futures activities in Member States, there was a suggestion that a global health futures laboratory unit should be created at WHO. This might then take on some of the activities suggested earlier in this section, but would also have the important function of serving as a focus of expertise to stimulate the use of health futures tools both within WHO and within Member States. Regional 'centres of excellence' were also suggested as a promising idea, building on the work of the existing focal points in EURO, PAHO and Asia (contact details in Appendix 7), and extending this idea to other regions.

CONCLUSIONS

HEALTH FUTURES AND THE NEW PUBLIC HEALTH ACTION IN SUPPORT OF HEALTH FOR ALL

The final chapter draws on the discussions throughout the consultation, including the closing plenary sessions, to present some overall conclusions from the meeting, examining particularly the role of Health Futures in the new public health action in support of Health for All.

The basis of a futures study is a concern to investigate, by use of some combination of tools (techniques and processes), the content of the future. A futures study may be undertaken for various purposes:

- to 'predict' future developments;
- to warn against potential threatening developments;
- to stimulate learning processes, imaginative thinking, and creative design for the future;
- to enable people to determine the future they prefer;
- to explore a range of alternative options;
- to support strategic policy development.

Futures thinking provides a set of tools that can help us to explore probable, plausible, possible and preferable futures to help guide present actions. Health futures studies, the application of futures methods to the field of health and health services, can help us to understand threats and opportunities, and to decide how we need to take action to move towards our desired goals and improve human health in changing environmental circumstances. Health futures takes as its concern the future development of health; it includes as a subset medical-care or health-care futures, which are restricted to a narrower set of issues.

The emergence of studies specifically labelled as 'health futures' studies is a comparatively recent phenomenon; such studies are still fairly rare, as are the people who call themselves 'health futurists'. However, studies and planning efforts, which although not labelled 'health futures', fall within the broad definition of a futures study given above, and studies or projects containing 'health futures' elements, have been carried out on a much more widespread basis.

In recognizing the potential importance of health futures studies, the point is not to promote the role of 'health futures' as a separate discipline, but to see it as one discipline, which along with others, such as health economics, analysis of decision making processes, etc., has a role to play in promoting the capacities of Member States to produce appropriate policy analysis and health policy development. Health futures can be seen as one part of the jigsaw that needs to be put together to support the achievement of Health for All.

The need for health futures studies

The discussion in Chapter 2 of the different studies and their use in policy formulation and support for health system decision-making illustrates the tremendous potential value of health futures studies in both developing and developed countries. Many of the examples where studies were clearly oriented towards a holistic view of human health, and where effects on policy formulation and implementation were particularly strong, in fact come from developing countries. Studies

The need for a health futures approach

"...we cannot continue doing what we have always done. Tomorrow cannot be just more of yesterday." Dr Hiroshi Nakajima

"Don't confuse forecasts with futures studies ... forecasts may take you where you don't want to go with considerable accuracy." Professor James Dator

"One of the virtues I found, as a newcomer to the concepts and ideas developed by those who have specialized and focused on health futures, or on futurism generally, is the emphasis on thinking creatively and widely about the futures, which widens our horizons about what could be. And then it enables us to think more creatively about what should be." Dean Harvey Fineberg

carried out in developed countries are often less clear in orienting themselves towards health, and often focused solely on aspects of medical care.

The issue of transferability of methods received considerable attention in several related areas. Firstly, the importance of recognizing that appropriate methods or tools for use in a particular futures study will depend on the specific context in which the study is to be carried out, including the socio-cultural context, but will also be constrained by economic and other factors. Secondly, there is the question of data requirements for health futures studies, discussed in detail in Chapter 2. Some of the more sophisticated modelling approaches that can be used in health futures studies require a level of demographic and epidemiological data that is not available in many countries, and particularly in developing countries. But it was also emphasized that lack of availability of suitable local data does not mean a study cannot be carried out, but only constrains the choice of tools to be used. Finally, transferability is affected by local capacities in terms of the necessary personnel with appropriate skills and experience, as well as resource requirements in terms of computer hardware or software. Direct assistance to Member States and provision of assistance for

supporting the development of national capacities to carry out futures studies is thus important, and this was the subject of several specific suggestions for future work raised in Chapter 4.

Despite examples of the actual value and influence of a wide range of studies, there is a considerable gap between the studies published and those used, pointing to the need to foster closer links between policy makers and health futurists. In addition, many of the existing models and tools are not used to the limits of their capability by policy makers. Most of the applications amount to exploring different possible versions of the probable future, i.e. extending business-as-usual into the years to come. Any restriction of health futures studies to examination of the most probable, or extrapolations from past and current trends, severely limits their potential usefulness in helping us to anticipate threats and opportunities, and to create and realize desirable futures. Futures studies therefore should include explicit consideration of a range of alternative scenarios. In particular, there is a lack of attention to negative scenarios involving ecological degradation, depletion of natural resources, conflict/violence, or economic decline. In anticipation of such negative possibilities, scenarios exploring them have a role to play in helping us to consider how we would manage any such decline, while maintaining as much as possible our present - or improving - levels of health.

Health futures studies can have an important role to play in stimulating the necessary public health action for the achievement of Health for All. In order to be in keeping with the principles and values of health for all, such futures studies need to be public and participatory. All health futures studies inevitably involve ethical issues in terms of both the substantive content (the questions asked) and the methods used. Much of the ethical content of writings on health futures studies, except for studies specifically relating to question of equity and justice, remains implicit only. This ethical content needs to be made more explicit.

Important health futures capabilities

- integral to the policy-making process
- health futurist expertise available at all levels
- scanning activities: present, prospective
- 'intelligence function': converts data to information
- use of some type of visioning process
- enables widespread participation
- transferable futures tools

In discussing important health futures capabilities that would assist Member States to think and act more creatively and effectively to achieve Health for All, the designs that emerged for the different countries and policy dimensions considered had a high degree of commonality. Eight features important for inclusion in most futures studies are reproduced in the box above and were discussed earlier in Chapter 4.

Taking health futures forward - ideas for action

A wide range of proposals was generated and discussed for different potential activities, and some specific projects, that could be undertaken to foster practical and useful health futures studies and research; these are reported in Chapter 4. There is no lack of tools, or even of good tools, but the problem is how to support dissemination of information on the different tools available, and how to facilitate the appropriate choice of tools for use in a particular context; a number of the proposals addressed these issues. Another major area requiring action is the support of Member States in developing internally the necessary capacities to carry out futures studies; this was addressed by a variety of suggestions for the development of training initiatives, suitable networks, and databases to give access to both knowledge and information on resources.

The plenary discussions, and particularly the input from those participants in the conference who were users or potential users of health

futures studies, confirmed the high importance attached to some of these suggestions. The first of these was the suggestion for the production of a 'health futures handbook', the aim of which would be to provide health professionals and policy makers, at both national and local levels, with the basic information they need to apply futures tools and processes in their work. Specific suggestions as to content, and to the process by which this might be produced, have been reported in Chapter 4. There was also widespread support for other activities falling under the general heading of training and education, including training workshops in health futures, and the use of the WHO fellowships scheme (and any other similar mechanisms) to support fellowships in the field of health futures.

Another area where many different possibilities were suggested was in the creation and sharing of information, and various networking activities. Much of the discussion focused around the creation of electronic networks, utilizing e-mail and bulletin boards. In considering the various suggestions outlined in Chapter 4 it is important to recognize that currently access to the technology to support such electronic networking is not equally available throughout the globe. Therefore, in taking forward any of these suggestions, specific provision needs to be made to enable access to the network contents to be gained by those currently without the necessary electronic technology. This could involve finding means to widen access to electronic networks and/or use of other media such as distribution of regular newsletters etc.

Roles for WHO

There is a potential role for WHO, working in collaboration with other relevant agencies and organizations, in supporting countries, and especially developing countries, that wish to undertake futures studies. This may involve: helping them to develop information systems where necessary; helping to develop skills and knowledge in local personnel; providing information and advice on tools, and on the use of resources such as outside experts. WHO can play an important role in facilitating the international sharing of experiences, not only in

gathering data and information, but also in ensuring effective networking and dissemination. A particular emphasis should be given to fostering exchange of experience and knowledge amongst developing countries, since, as noted above, there is already considerable experience of health futures studies gained in some of these countries.

The need for impartial examination of the different futures tools, their advantages and disadvantages, possibilities and difficulties, suggested another specific role for international organizations like WHO in the evaluation of such tools, paying particular attention to what is transferable and feasible for use in developing country situations. Fulfilling this role would include supporting field tests to evaluate methods in use, and formulating any necessary refinements. Another important component would be the facilitation of a common understanding and use of terminology. There is also a potential role in connection with research into health futures, not necessarily in terms of supporting individual institutions, but in helping in the networking of these institutions, analyzing the work done and identifying the gaps and promoting research in the fields where more knowledge or tools are needed. In order to undertake these roles, and to provide other support to developing countries in this field, WHO would have to develop appropriate in-house capacities and resources.

A certain amount of futures work has already been carried out by other UN organizations, such as a specific UNDP project on African futures, and work within UNESCO. There are many benefits to be gained from forming new alliances and new partnerships, and WHO is well placed to take a lead in this, working with other UN organizations and the other NGOs, networks and associations, in particular with the International Health Futures Network and the World Futures Studies Federation. There is a clear potential role for WHO in fostering and supporting existing links as well as developing

new ones, and especially in introducing a concern for health into the work of other groups and agencies dealing with the future.

In summary, the functions of WHO, especially technical cooperation with Member States and directing and coordinating international health work on health futures, should be further enhanced.

Health futures and Health for All - challenges and opportunities

In their closing statements at the consultation, many of those who are users or potential users of health futures studies emphasized the value to be gained from integrating such a perspective within the policy-making process. A number of challenges remain to be overcome if health futures studies are to be used to their full potential: achieving full participation and joint ownership between all relevant stakeholders; putting health on the agenda of all national policy and planning efforts; utilizing appropriate tools to translate the aspirations contained in visions into specific policies and plans in the health and other sectors; and communicating clearly the terminologies, techniques and processes that can be involved in carrying out futures studies.

Sufficient experience of health futures studies has accumulated to confirm their usefulness. This experience demonstrates that the spectrum of futures tools can be used in different ways to support action corresponding to the four policy dimensions of the ninth General Programme of Work, namely: health and human development; access to health services; health promotion and protection; and prevention and control of priority health problems. Provided that the challenges referred to above can be overcome, it will be possible for countries to use the potential of health futures studies to provide the means of systematically thinking about, and exploring, the future in a way that helps them to design the necessary action to be taken in order to turn the vision of Health for All into a reality.

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Appendix 1

Consultation on Health Futures, Results and Methods 19-23 July, 1993 Agenda

19 July 1993

9:30 a.m. Opening

Moderator: Dr J.-P. Jardel, Assistant Director-General

Dr H. Nakajima, Director-General

Welcome address

Dr H.R. Hapsara, Director, HST

Interest in Health Futures

Introduction of participants

Dr C. Bezold

An overview of the health futures field

Dr S. Sapirie, Chief, MEP

Method of work

11:00 a.m. Macro-Environment of Health - Moderator: Dr T. Hancock

Overview

Dr T. Hancock

Macro-Environment of Health - Overview and commentary summarizing the studies reviewed

Presentations

Tan Sri Dato Dr Abu Bakar Suleiman

Health Planning in Malaysia - Description of a recent health planning effort using "Days of Healthy Life Lost" (DHLL) indicators, social/economic cross impact and alternative organization scenarios

Dr M. Garrett

National Future Studies: An Introduction for Policymakers

Mr G.H. Garland

Peru in the 21st Century - Challenges and possibilities

Professor A. Onishi

Fugi Model 7.0 - A global model of economic, environmental and health change

Panel Reaction

Professor J. Dator

Dr M. Wolfson

2:00 p.m. Plenary

Summing-up

Dr T. Hancock

2:30 p.m. Future Health Status - Moderator: Dr V. Marshall

- Overview** **Dr V. Marshall**
Future Health Status - A summary of selected studies of future morbidity, health of the elderly and AIDS
- Presentations** **Dr J.L. Bobadilla**
Health Transition in middle income countries - A study to analyze health changes, in the midst of intensive economic and social transformations
- Dr A. Suwandono**
Future Health Trends, Indonesia - Description of a national trend assessment carried out in support of long-term health planning
- Dr M. Wolfson**
Modelling the health status of an ageing population - A description of the CEPHID Modelling Project projecting health, income and demography
- Dr C.J. Struchiner**
AIDS Modelling and Projection in Brazil
- Panel Reaction** **Tan Sri Dato Dr Abu Bakar Suleiman**
 Dr L. Malcolm
- Plenary**
- Summing-up** **Dr V. Marshall**

5:30 p.m. Reception

20 July 1993

9:00 a.m. Future Health Resources - Moderator: Dr Bui Dang Ha Doan

- Overview** **Dr Bui Dang Ha Doan**
Forecasts of supply and requirements of health workforce : a state-of-the-art assessment
- Presentations** **Dr H. Traxler**
Physician modelling in the United States and its uses in assisting policy making - Projecting the needs and production of health professionals in the U.S. through a system of interlinked data bases and models
- Dr Young-Soo Shin**
Development of health resource allocation Model in Korea
- Dr R.W. Haneveld**
Modelling dental care and future scenarios - The development of future scenarios for planning dental services in the Netherlands

Panel Reaction **Dr J.L. Bobadilla**
Dr H. Fineberg

Plenary

Summing-up **Dr Bui Dang Ha Doan**

11:30 a.m. Emerging Health Technology - Moderator: Professor T. Tsubo

Overview **Professor T. Tsubo**
Emerging Health Technology - A summary

Presentations **Dr C. Bezold**
Forecasting heart disease incidence and treatment: the Battelle/Institute
for Alternative Futures study and beyond

2:00 p.m.

Dr T. Jorgensen
Future laboratory technologies for community care

Dr X.R. Zhang
Global Trends in the use of Traditional Medicine - Evidence from
selected countries

Mr D. Ullman
Growth and trends in utilization of homeopathic medicines

Dr J. Fisher
"Rx2000: Medical miracles in our future - Expected breakthroughs in
health, medicine and longevity by the year 2000 and beyond"

Dr B. Chaiken
Quality FIRST - An example of evolving information technology in
support of clinical practice guidelines and monitoring for raising quality
and controlling costs

Panel Reaction **Dr K. Goto**
Professor J. Dator

Plenary

Summing-up **Professor T. Tsubo**

21 July 1993

9:00 a.m. Alternative Health Care Systems - Moderator: Dr J. Bryant

Overview **Dr J. Bryant**
Alternative Care Systems - A summary of the studies of alternative
health system developments and the challenges ahead, considering
technology, resources and ethics

Presentations **Dr A. Sanchez**
Future scenarios in Health in Nicaragua - The health situation and
organization of services at the beginning of Century XXI

Dr L. Malcolm

Towards a health system based upon primary health care: radical health reform in New Zealand

Dr M. Lobo

The Aga Khan University and Alternative Health Systems Development
- A description of action research and policy change in Pakistan

Dr M. Rusnak

Inequities in health: What are the alternative scenarios for Slovakia?

Dr J.L. Bobadilla & Dr C. Murray

World Development Report - Investing in health. The World Bank study methodology and policy recommendations

Panel Reaction Dr K. Goto
Dr H. Fineberg
Dr L. Nath

Plenary

Summing-up Dr J. Bryant

2:00 p.m. Tools for Health Futures Research - Moderator: Dr R. Schreuder

Overview Dr R. Schreuder
Tools for Health Futures Research - A summary of methods and tools used in health futures studies

Presentations Dr J. Barendregt
PREVENT - a model to estimate the health benefits of prevention

Dr T.R. Fenton

Forecasting hospital length-of-stay with artificial neural network modelling

Professor T. Tsubo

The value of bioforecasting in future health - Innovative health planning technology by bioforecasting approach as applied in Japan

Dr T. Modis

Forecasting via the use of natural laws

Mr M. Moldaver

Dynamic Modelling in Health - Using STELLA to address future care requirement for the elderly while controlling costs

Panel Reaction Dr M. Rusnak
Dr M. Garrett
Dr A. Onishi

Plenary

Summing-up Dr R. Schreuder

22 July 1993

9:00 a.m. Vision of Health Futures - Moderator: Dr C. Bezold

Introduction Dr C. Bezold

Issues to address Dr J.P. Jardel

Sub-group discussions The development of scenarios for Health Futures at national and international levels

Sub-group presentations
Plenary

Summing-up Dr C. Bezold

3:00 p.m. Next Steps Moderator: Dr R. Schreuder

Introduction Dr R. Schreuder

Specific proposals Dr G. Stott
Monitoring health and medical technology

Dr K. Mott & Dr J. Le Duc
Global monitoring of infection

Other prepared proposals

Regional plans SEARO
EURO
AMRO

Plenary

23 July 1993

9:00 a.m. Briefing Dr R. Schreuder

Sub-group work

Sub-group presentations

2:00 p.m. Plenary

Panel reaction Drs Fineberg, Dator, Suleiman, Mishra, Jardel

2:50 p.m. Closing Statements Any participants

Thanks HST

Appendix 2

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Appendix 3
Opening statement
Dr Hiroshi Nakajima, Director-General
World Health Organization

Distinguished colleagues, ladies and gentlemen,

I have pleasure in welcoming you to this first Consultation on Health Futures.

I am impressed with the breadth and diversity of experience you represent. Some of you are old friends, and your work is familiar to us, but there are a number of you, from various fields of health or from other sectors, whom we have not had the pleasure of welcoming before. I look forward to the fresh ideas and new experiences that all of you will share with us.

I have called for a consultation on health futures at this time for several reasons. In 1977 the World Health Assembly decided that the main social target of governments and WHO should be the attainment by all citizens of the world by the year 2000 of a level of health that will permit them to lead a socially and economically productive life. Here we must be careful to distinguish between the aspiration of "health for all" and the target set in 1977 which was the year 2000. In 1981 the Health Assembly adopted a global strategy for achieving that target and most Member States have their own national policies and strategies.

In 1992 Member States carried out a second evaluation of progress in implementing the Global Strategy. While progress on many fronts could be detected, it was clear that the vision of health for all was only slowly becoming reality. While commitment to the aims of health for all has remained firm and Member States have adopted the primary health care approach, in many cases implementation has slowed down. This is not only because of economic factors but also because of the constraints on achieving the real participation of all related sectors, the rigidity of health systems and weak infrastructure, and the inadequacy of efforts to promote health and prevent specific health problems.

In some regions and countries certain basic health indicators are actually worsening. Our main concern, however, is that in many countries the gap in health, social and economic well-being between the advantaged and the disadvantaged is actually widening.

There are many reasons for the difficulties being encountered in health development, but it will be no surprise to you that rapid and profound change of many types is complicating countries' efforts to achieve their health-for-all goals. Change is dramatic and well known in such dimensions as migration, urbanization, environmental pollution, economic change through cycles of growth and recession, aging, inflation, natural disasters, local and regional conflicts, national and international political change and instability, and even the biological environment. Some change can be considered beneficial, such as developments in medical and information technology, or the generally rising levels of education. But the frequency of dramatic change in many areas creates increasing uncertainty about the future.

The developing countries have been experiencing an epidemiological transition. The growing prevalence of cancer, cardiovascular disease, diabetes and other chronic conditions, added to the long-standing problems of communicable diseases, such as cholera, malaria and tuberculosis, impose a double burden on health care systems. There are also worrying trends in mortality from accidents and suicide in young adults, particularly in developed countries. In addition, there is the pandemic of HIV infection and AIDS, which imposes a particularly heavy burden on developing countries. As Dr Bobadilla has written: "the theory of the epidemiologic transition provides an invaluable framework for projecting likely scenarios of health needs". All these realities must be taken into account when implementing public health action for the achievement of health for all through primary health care. We must evolve and develop new approaches, new mechanisms, new partnerships and new resources. I have stressed that we cannot continue doing what we have always done. Tomorrow cannot be just more of yesterday. Therefore, we need frameworks within which to implement new public health action

for accelerating progress in achieving health for all. Thus, in this last decade before the year 2000, we are calling for "new public health action" aimed at accelerating progress towards health for all in a rapidly changing world.

We shall be hearing from you about new biomedical technology, including genetic-based technology, for diagnosing and predicting the future course of disease, new and emerging preventive and treatment technology, and expected pharmaceutical breakthroughs. I am aware that you bring to this Consultation a wide range of experience in methods of trend analysis and prediction, dynamic modelling, scenario analysis, research for policy change, and a variety of epidemiological and other health-related methods of prediction.

This Consultation is designed to review and assess the value of a wide variety of health futures studies. Your conclusions and recommendations on the usefulness of such futures work and its results will help WHO and its Member States to approach the rapidly changing world with some tools and some confidence that, while we probably cannot predict what the future health situation will be, we can have a range of expectations and a vision of what we wish to accomplish.

Our Organization's efforts to change itself so as better to meet the future are based on a number of principles. These are:

- (1) we continue to strive for equity in health. There is simply no justification for the wide disparities in health that exist and grow across society.
- (2) we place emphasis on human worth and on the moral value of all endeavours towards health development.
- (3) we stress the need for a wider partnership in health development. Within countries this partnership must extend across economic and social sectors, across government, nongovernmental and private enterprise, and must include community, and even family, action. Internationally, new partnerships are needed among multilateral, bilateral and nongovernmental organizations, and between research and development institutions of many types.

As part of health infrastructure and systems development I attach considerable importance to the strengthening of national capabilities in health futures research, especially in developing countries.

I feel that there are unmet needs that present challenges in futures studies. The first is the need for better ways to handle alternative perceptions of reality; a group as diverse as this one will no doubt frequently encounter widely varying perceptions of what exists, and how and why it may be changing. The second is the need for more adequate models of social change.

This is an important Consultation which is certain to assist WHO in clarifying the possible future, having taken into consideration knowledge of the current situation. It will also assist in further clarifying public health action that could contribute to a preferable future. Its discussions and recommendations will also be of value to WHO in planning its cooperation with developing countries in strengthening their capabilities for health futures activities.

At the Forty-sixth World Health Assembly last May I said that our vision of health for all captures fundamental concerns for building lasting peace through social development. The principles of health for all express our yearning for a world where all peoples and individuals have access to effective and affordable health care. It is an aspiration for equity in health opportunities; it represents a quest for social justice.

I look forward to your vision of health futures and to your ideas for the next steps in this interesting

and vitally important field.

As the year 2000 draws closer, the world situation shows many signs of worsening. We have serious economic problems to face in the future, with their consequences for democracy, particularly in developing countries. Can we sustain the model of so-called western democracy in many developing countries or do we need to rethink the concept. The World Conference on Human Rights in Vienna engaged in a serious debate about human rights itself. Our work contributes to some of these rights, the right to health, the right to public health, and many other rights.

So, I shall now give the floor to you for your deliberations. Thank you once again for coming at this difficult time to assist in this important consultation.

Thank you very much.

**Address by Dr H. R. Hapsara
Director
Division of Epidemiological Surveillance and
Health Situation and Trend Assessment**

Ladies and Gentlemen,

WHO has been involved in various futures studies or research for health for more than two decades, a first Consultation on Health Statistics Projections was convened as early as 1971. The importance of futures research for health development was fully recognized by the World Health Assembly in 1990. An Assembly resolution was then devoted to the issue of the significant potential of research in promoting and improving health, and requested the Director-General to identify appropriate methodologies for trend assessment and forecasting, including epidemiology. The Second Evaluation of the Implementation of the HFA Strategy devotes a whole chapter to the outlook of the future. I feel it is also relevant to inform you of the positive responses of the WHO Advisory Committee on Health Research which was held last year, expressing the importance of future research for health development. As you may know the Director-General himself has personally expressed his own vision for health futures, not only today, but on various previous occasions. All of this confirms the interest in having a better vision of future health, particularly within developing countries.

As you may know there are many definitions or perceptions of the meaning of futures activities, studies or research. I agree with the thought that its function is to examine the future to help guide present actions.

There are many challenges or constraints to be faced in futures activities, two of the most important being those just mentioned by the Director-General, "the need for better ways to handle alternative perceptions of reality" and "the need for a more adequate model of social change". It is observed that there is a lack of staff and financial resources for these activities in many developing countries and WHO cooperation in these countries is still limited for this subject. It should also be noted that international collaboration and networking in this field in many regions is still weak.

Considering these various challenges the purpose or objective of futures activities for health development is to provide a useful tool for policy making and planning for health development; this tool is usually focussed more on a specific aspect of health development.

Based on various experience and thoughts so far in enhancing futures activities for public health action, it is important to take into account the following three main approaches or policies:

- 1) First, it is important to underline that futures studies or research should be an explicit part of the change process of health development; futures studies must be oriented to the accepted value of health development. Therefore, futures studies should be based on a framework for new public health action. In enhancing futures studies it is important to underline that the results should be useful in supporting policy making and planning of new public health action.
- 2) Second, it should be recognized that human health should be seen in a holistic way. Thus futures studies should be undertaken within the broad context of health determinants. Strengthening of capability for futures studies or research for health development must be based on a balance between health and biomedical, socio-economic and methodological fields. Indeed in these activities balanced attention must be paid to the substance of health, including medicine, and the processes of change.

- 3) Third, it is important in "futures" activities that people themselves be considered as actors in identifying and deciding their future, and not just be subjects addressed by scientists or planners. It is significant to strengthen the capability of futures activities for health development, especially in developing countries.

There are basically four main group activities to accelerate futures studies or research for public health action:

- 1) Enhancing futures studies or research using available techniques. The selection of a particular technique should be based on the knowledge of the phenomenon studied and on a thorough understanding of the advantages and limitations of the technique.
- 2) Cooperation with Member States, especially developing countries, should primarily serve to enhance the capability of national staff and institutions in using futures research as a tool to support health policy formulation, health planning, monitoring and evaluation of public health action.
- 3) If the methods we hear about this week are deemed useful and effective, WHO should intensify its efforts to promote and coordinate various national health futures studies, by providing direction and through exchange of experience. Regional centres of excellence and global networks of persons and institutions involved in futures activities may be used to facilitate such information exchange.
- 4) There is no doubt that futures research for health development is now an expanding scientific activity. What are the perceived needs for research and development in this field of futures research? An answer to this question is expected during this Consultation.

This Consultation on health futures is one of WHO's research and development activities and considering its three stated objectives, we expect that in essence this Consultation will:

- 1) enhance our understanding or perception of various approaches for health futures activities, including epidemiological aspects, and,
- 2) give guidance on how to promote and strengthen health futures activities in support of public health action for the achievement of health for all.

Finally, may I ask all participants to actively contribute to the development of the vision of health futures on Thursday and to propose on Friday what might be the next steps in this field.

I thank you for your attention.

Appendix 5

AN OVERVIEW OF THE HEALTH FUTURES FIELD

FOR

THE WHO HEALTH FUTURES CONSULTATION

by

Clement Bezold
Institute for Alternative Futures
and
Alternative Futures Associates

and

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June 1993

1. Introduction

This paper reviews the nature of the health futures field as part of the WHO Health Futures Consultation, July 19-23, 1993. The purpose of the Consultation is to review contemporary experience in health futures studies and research.

Given this context, this paper will review the major aspects of futures thinking, compare health and medical futurism, review specific methodologies, provide highlights from a range of substantive health futures studies and projects, and finally give our sense of the future of health futures (our plausible and our preferred forecasts). There is a wide range of health futures literature much of which will be reviewed at the WHO consultation and some of which we included in an earlier reader on the field.¹ In this paper we will include references which complement but largely do not repeat what will be covered at the Consultation.

This paper focuses on health futures material in English, particularly from North America. There is much excellent material from Europe, and Asia, as well as Latin America and Africa. The WHO Consultation will aid in making this work more visible.

Health futures provides important tools for guidance, particularly in turbulent times. And the 1990's will see great turmoil in health care and in society in both the developed and developing countries. Health care reform will continue, with major changes likely even in the United States. Some health care administrations and organizations will be bankrupt and some organizations will go out of business. Most will more seriously begin assessing the longer term future, even as they prepare for the current turbulence. From the individual's perspective, the forces that foster health, from employment and community, to healthy behavior, to biomedical advances will offer promise for many. However, without positive action, the chances for good health for the poor will remain dramatically lower than the average. The 1990s will be a time of great trouble and a time of great opportunity. Health futures thinking provides a set of tools that allow more effective exploration of what might happen and they help us clarify what we want to happen, what we want to create. This paper sets out the key approaches that have evolved in recent years for thinking about the future.

1.1 Growing Resources for Health Futures

This WHO Consultation on Health Futures is important to both take advantage of the growing resources in the health futures field, and to share health futures with other futures groups.

The field of futures, particularly health futures, has grown significantly. For example, the Dutch Government has an official Steering Committee on Future Health Scenarios (STG). Within the WHO family, The Regional Office for Europe has held two consultations on health futures focused on future trends in society and the European Health For All Strategy.² The Pan American Health Organization (PAHO) has an ongoing program to make health futures tools and forecasts available to their member states.³ WHO/EURO has held a series of meetings on health futures in its region⁴ UNESCO, likewise, has supported dissemination of futures tools to a wider audience⁵ as has the OECD.⁶

General futures groups such as the World Future Studies Federation and the World Future Society provide networks and publications.⁷ For the French speaking community, the Paris-based organization *Futuribles* has developed a network as well.⁸ For German speakers, the Swiss Society for Futures Research compiles futures material from German and English sources.⁹

Some of these and a large number of other efforts have joined to form the International Health Futures Network (IHFN). The IHFN has published a reader on health futures and has an ongoing newsletter.¹⁰ Projects are emerging from IHFN which will catalogue efforts worldwide to invent 21st Century health systems, and to explore the future of public health.

Thus the WHO Consultation, by involving several of these efforts, in addition to its central task of assessing the value of health futures for the work of WHO, will assist the health futures field to reflect on its current state of development.

2. On Futures Thinking

2.1 Thinking about the Future

"Thinking about the future is only useful and interesting if it affects what we do and how we live today."

This quotation by James Robertson, a leading British expert on alternative futures, contains the essence of futurism. Good futures work is to some extent concerned with forecasting the future, but more importantly it is concerned with thinking about the future and in helping people who are not futurists to think and act more wisely about the future. As Edward Cornish, founder of the World Future Society, puts it:

"Futurists take historical fact and scientific knowledge and add human values and imagination to create images of what may happen in the future."¹¹

James Roberston is also making another important point: thinking about the future is of relevance to the decisions we make today. Futurists study ideas about the future, most often believing the future is "plastic" and can be shaped. Indeed, the belief that the future will be shaped by human decisions and actions is one of the characteristics that most futurists share. They recognize that while the immediate future (one to five years) will be largely shaped by decisions previously taken (while recognizing of course that "dis-continuities" such as the 1973 oil shock or the 1989 fall of the Berlin Wall can dramatically alter the future very swiftly). The medium-term future (5 - 20 years) and the

long-term future (20 - 50 years) will be substantially shaped by the decisions we make today and in the years ahead.

Beyond 50 years, the far future is so far removed as to make thinking about it extremely difficult. For example, how much of what we accept as commonplace today could have been anticipated in 1930? And how little of what was commonplace in 1930 would have been anticipated in 1880 - most of the mechanical and electrical equipment of the 20th century? This does not make thinking 50 years out irrelevant, but it frees us to make use of science fiction literature (which can be very helpful even in thinking about dramatic changes which could surprise us in the next decade).

Clearly, if futures work is to help in creating a future that we find desirable, it must make policy makers and individuals better able to create the future they want. This brings us to two other important points about futures thinking that were identified by Roy Amara, founder of the Institute for the Future.¹² The first is that the futures field is concerned with creating new images of what is possible; the second, that good futures work increases people's participation in thinking about and creating their preferable future. These are two important related points.

Failure to understand these points leads some to assume that the future is fixed and approaching with an awesome inevitability about which there is nothing we can do. Such a passive way of thinking about the future inevitably results in apathy, in a feeling of impotence and lack of control. Futurists by and large take a proactive stance with regard to the future. If they are not actively involved in seeking to create change themselves, they are certainly aware that their presentations and "predictions" will form the basis for others to seek to create change. At its best, futurism is - to use the phrase coined by Alvin Toffler - a form of "anticipatory democracy", helping people to decide what sort of future they want and how they might achieve it.

2.2 Futures: Role in Anticipating vs. Direction Setting and Commitment

Our bias is that futures is a tool for wiser action by stimulating the imagination, encouraging creativity, identifying threats and opportunities, and allowing us to relate possible future choices and consequences to our values. However, some experts in this field are content that futures should simply be able to develop accurate predictions. These experts argue that it is not the role of futurists to be normative, to work in the area of vision. Figure 1 puts this disagreement in the context of management theory. Earle Klay, in "Strategic Management and Futures Research," uses Figure 1 to differentiate the needs of

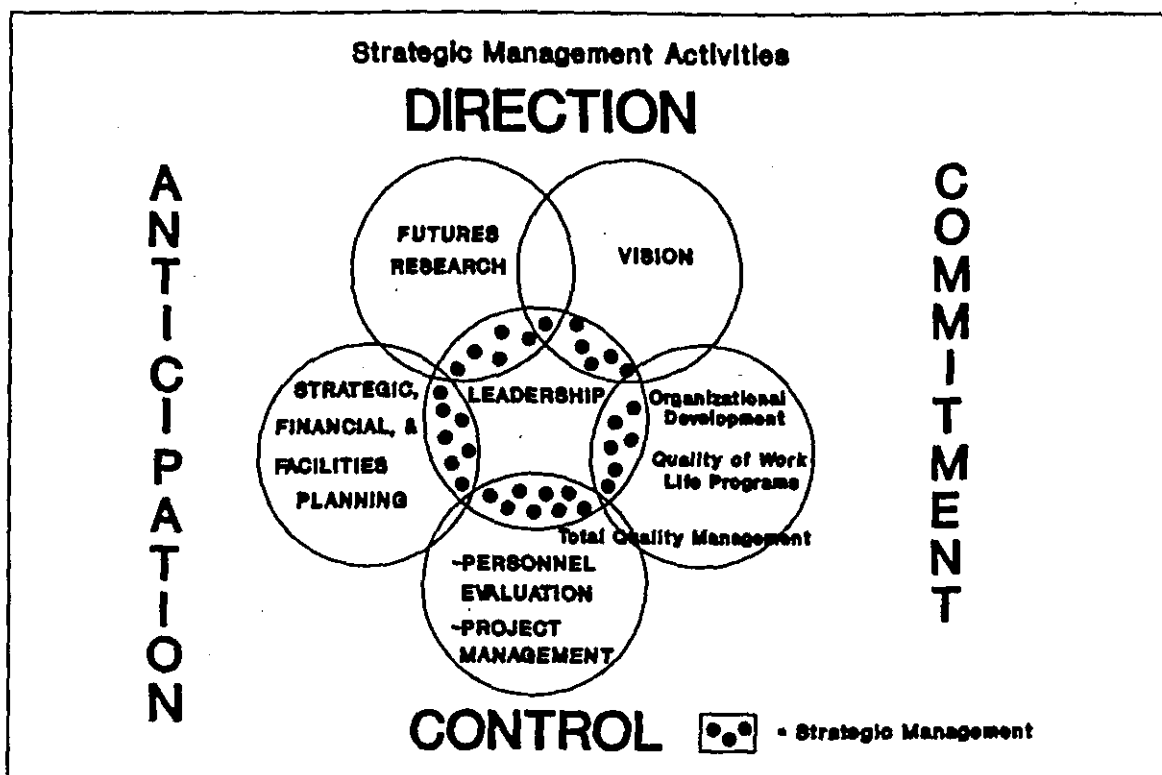
- anticipation
- direction setting
- commitment to action
- control or management.

Futures, as we use the term, includes both futures research, and vision, and these in turn aid anticipation (looking ahead), setting direction and commitment (developing preferred futures and the will to bring them about). Futures research aids anticipation and direction setting, while vision aids direction setting and commitment.

Source: Adapted from William Earl Klay, "Strategic Management and Futures Research", *Futures Research Quarterly*, *Futures Research Quarterly*, Summer 1988, p. 51.

Thus health futures work, at its best, does more than identify what might happen, it enables individuals and organizations to find or enhance the leadership necessary to move in desired directions. The discovery of vision in the 1980s by organizations is a testament to the fact that futures in which

Figure 1



the environment is too threatening or which involve a great deal of internal change for the organization may be ignored. Vision allows people throughout the organization to perceive risk and to approach change more effectively.

2.3 Types of Futures

A related way to distinguish between aspects of health futures (particularly what is referred to as "futures research" and "vision" in Figure 1) is to differentiate types of futures. One way of categorizing the futures that we face has been proposed by Norman Henchey, a Canadian futurist.¹³ He suggested that we think about the future in the following four ways:

- possible, i.e., what may happen;
- plausible, i.e., what could happen;
- probable, i.e., what will likely happen; and,
- preferable, i.e., what we want to have happen.

Possible futures are all the things we can possibly imagine, no matter how unlikely. Thus possible futures may include "science fiction" futures that transgress the presently accepted "laws" of science.

Plausible futures represent a narrower scope because we emphasize those possible futures that seem to make sense given what we know today. Plausible futures can be discrete forecasts of individual components (see trends below) or a set of scenarios which each combine differing trends and together describe a range of alternative futures. More will be said about scenarios below.

The probable future is those things we think most likely to happen, based on our examination of our present situation and our appraisal of likely trends and future developments. This is often called descriptive forecasting. Most people see the future as an extension of the present with little significant

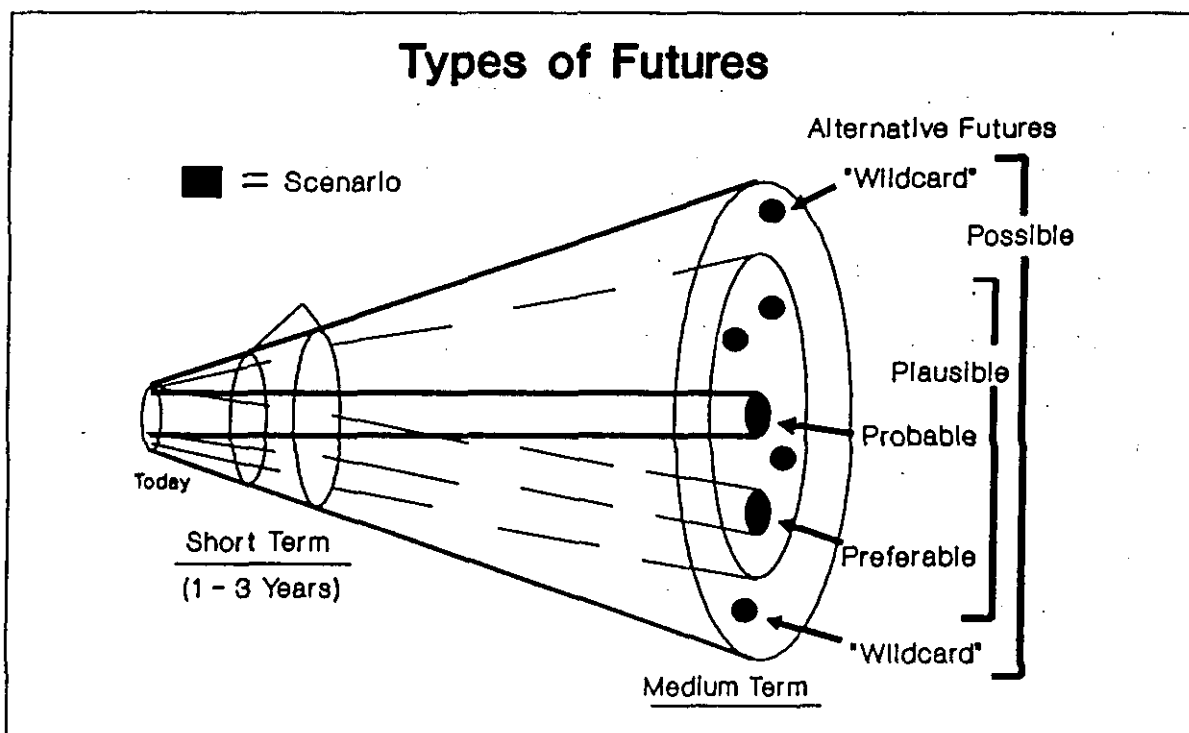
change. If their nation's economy is in a recession, the individual's estimation of the likelihood of scenarios forecasting hard times increases dramatically. Typically this gloomy assessment recedes as the economy improves. Likewise most government and business planning has assumed that the probable future would be a straightforward extrapolation of the present. Ironically, history has shown that this image of "the" most likely future turns out to be the most likely not to occur.

The preferable future is the one future we would like to have happen and is sometimes called prescriptive futurism, or normative forecasting; this is where vision becomes important. Visions or preferable futures generally begin by identifying and trying to create a future that does not exist. Visions move reality beyond the present toward the best that can be. A set of scenarios can include visionary scenarios (that move well beyond present realities). Descriptive forecasts which are based solely on recent trends can preclude futures that are different.

One way to understand these different futures is shown in Figure 2. The outer zone is the zone of possibilities, within which is the narrower zone of plausible futures; the probable future is one of these, but other scenarios can be described. The preferable future is often different from the probable future and is usually - but not necessarily - within the plausible zone. The "futures cone" makes it clear that all these futures start from where we are today, but then diverge. The closer one is today, the harder it is to tell them apart, but clearly choices made now can have dramatic effects over time.

In Figure 2, the inner circle represents the range of plausible paths the future might take. There is a wider space, the circle labeled "area of possible futures" which is driven by a variety of "wildcards". "Wildcards" are typically low probability but high impact events. Having a sense of what type of wildcards might arise is useful, though most planning efforts do well to expand their focus to deal with the triangle defined by the more plausible futures. Yet the fall of the Berlin Wall and the transformation of the Soviet Union should remind us that dramatic, seemingly implausible change can occur very swiftly: We need to be flexible enough to deal with surprises when they occur.

Figure 2



2.4 Assessing the Likely Future versus Creating the Preferred Future

There is often a marked difference between the future we think is likely to happen and the one we would prefer to have happen. It is important to stress the value of examining both the probable and the preferable future, a process which can be very liberating for participants. Too often our image of the future is the image of what we think will most likely happen, which brings with it an awful sense that the light at the end of the tunnel is a train coming toward us. The probable future is something that seems to be done to us, something over which we have little or no control, and often something we don't like very much. If health futures focuses too much upon the probable, which it has a tendency to do, (after all, planners - be they politicians, civil servants or in the private sector - like to know what to plan for, as do ordinary people) then it runs the risk, perhaps inadvertently, of disempowering people and denying them choice. If they are told "this is the probable future," then the only choices left for them deal with how to prepare for it, how to brace for it.

The preferable future, on the other hand, is a liberating and empowering future, especially when it touches participants more creative capacities. It not only enables but encourages people to say this is the future that we want (the emphasis being on we; this should be a collective process). The energy and creativity released in a "preferable futures" process can be quite astonishing.

2.5 Two Fundamental Assumptions about the Future

Consistent with the comments above, we make two fundamental assumptions about the future that are relevant.

First, the future is uncertain. There is no single, certain forecast for the future of health and health care. While we and the organizations we work for would like to eliminate this uncertainty, we must be able to live with it effectively and creatively. Understanding key trends and alternative futures for health conditions, for health care, for our organizations, and for our communities can enhance our effectiveness and creativity.

Second, we choose and create major aspects of the future by what we do or fail to do. While the future is uncertain, and much of the future is beyond our control, there are large aspects of the future which we can control. Visions and strategies linked to a clear sense of trends and scenarios make us better able to shape the future we prefer.

3. Health vs. Medical Futures: A Vital Distinction

This paper explores the field of health futures. It is extremely unfortunate that we have come to use the word health care almost synonymously with the word health, thus confusing two very separate issues, namely health and medical care (or more accurately, sick care). It is vital that we distinguish between health and medical care, because otherwise we run the risk of falling into the trap of believing that medical care equates with health whereas it is, in reality, only a minor determinant of health.

This distinction is equally important in the field of health futures, where we need to make a distinction between thinking about the future of health and thinking about the future of medical care, which is a subset of the former.

3.1 Health Futures

Health futures is concerned with thinking about the future of health. Will we be more or less healthy in the future? What will be the major influences upon health in the future? What values will

we attach to health and what role will health play in our decision making in the future? What will be the future relationship between health and medical care?

A great deal of health futures is thus concerned with societal futures in general and particularly those aspects of societal futures that affect health and wellbeing. This includes such issues as wealth and poverty, future living and working conditions, the sustainability of our environment, the future state of social networks and social support, the extent of future participation and empowerment and a whole host of other issues that affect personal and collective health and wellbeing. Health futures also considers the subject of healthy public policy, or in other words, what future policies might be developed if health and wellbeing were a prime determinant of public policy.

In short, health futures is concerned with the future of our state of health, dominated as it is by environmental, social, economic and political determinants and by biophysiological, genetic and to a lesser extent, medical care factors. The World Health Organization, through its development and advocacy of HFA, the Primary Health Care Strategy, health promotion and healthy public policy has done much to shift the emphasis from thinking about medical care to thinking about health.

3.2 Medical Futures

Medical futures, on the other hand, is a sub-set of health futures, dealing with only a comparatively minor determinant of future health. It is concerned with the future of the institutions and professions that comprise the medical/sick/health care system that constitutes 6 to 12 percent of GNP in most industrialized nations. It is thus concerned with such issues as the size, structure and financing of health care services, the role of physicians and other health care professionals, future technologies and therapies, and the impact that health care services may have upon overall health and wellbeing in the future.

The concentrated wealth of the medical sector has usually meant that in any discussion of health, including any discussion of the future of health, medical care and medical futures predominated. While forecasts and visions for the future of the health professions and health care delivery are essential, it is important that health futurists not lose sight of the primary objective - health - and become overly concerned with medical futures. Similarly, those who are concerned with medical futures should be clear in their own minds and in the presentation of their work that their work deals with health (or medical or sick) care rather than with health.

It is important to recognize in fact, that the tail does not wag the dog; health care in the future will be determined by societal futures, not the other way around. That is why it is necessary to begin with an environmental scan that scopes out the future shape of society, then try to understand what health and health care would be like in such a society.

4. Approaches to Futures Studies

There are a wide range of approaches for looking into the future. Consistent with the above discussion we prefer to group them into four major approaches: trends, scenarios, visions, and strategies. The first two develop plausible forecasts, as noted. Visions clarify the preferred future. Strategies include the wide range of planning and action related activities which link plausible and preferred futures to action.

4.1 Trends

A trend is a pattern of change over time in something of importance for the observer. Trends typically focus on discrete topics, e.g., health care costs, disease prevalence, therapeutic advances. They generally involve plausible forecasts, usually extrapolated from recent or past experience (though at times trend monitors or their clients inappropriately confuse what they think is plausible with what they prefer). There are a variety of quantitative and qualitative methods for developing trends, including environmental scanning with various degrees of quantification, delphi and other surveys, and expert judgment.

It is important to understand how trends evolve, and how to spot a trend in its early stages. As trends grow in visibility and importance they often become "issues" - changes or problems that we take action on. Thus an "issue" emerges over time, based on its underlying trends. Figure 3 illustrates this emergence of a trend into an issue. In this context an issue is simply a trend to which greater attention is given and in most cases, on which action is taken.

Once an issue has emerged, it is easier to observe by scanning the mass media. However, many trends can be spotted years in advance in trade or scientific media. And even before that, artistic or visionary thinkers will explore the ideas or forces that will make up the trend. Thus, in the early 1960s, pollution was seldom thought to be a serious problem in the U.S. and environmental concerns were relatively low. Rachel Carson had a different feeling of the trends in environmental conditions and wrote the book, *The Silent Spring*, which hastened the perception by others. Today the environment is a dominant issue.

In most areas of health care, trends can be searched for at these various stages of development. The earlier a trend can be spotted, the greater flexibility an organization has to respond to it. Some organizations and most governments wait until trends become issues and then often for the issue to reach a crisis state. When a trend is at a crisis state and is getting significant attention in the media (the top of the curve in Figure 3) the decision costs for politicians are usually lowered, but the range of options is also narrowed. In Section 5 we will consider examples of trend-related forecasting in the health arena.

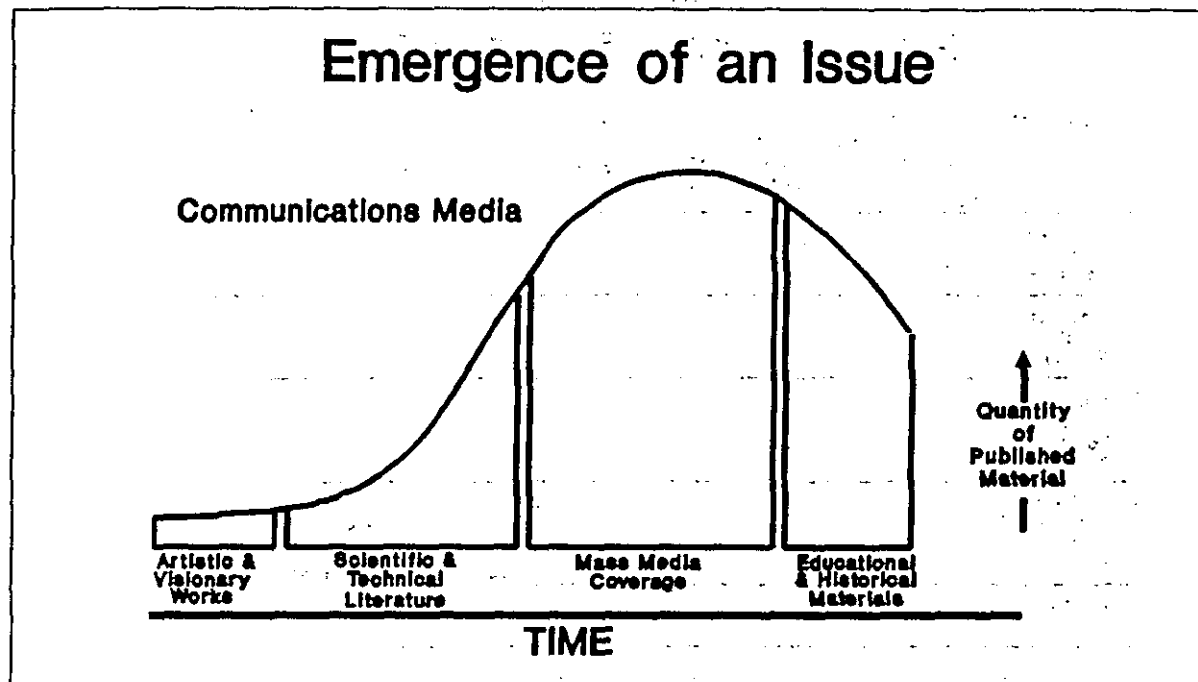
Attempting to look farther into the future is important to alert us to threats and opportunities. Positive change can be accelerated to the extent that we look ahead at what should be changed.

4.2 Scenarios

Trends focus on change in certain specific topics over time, e.g., poverty, AIDS, therapeutic breakthroughs; or health care finance. However, trends often move in conflicting directions. Scenarios are a powerful tool that have been developed for considering how interacting sets of trends might lead to a range of conditions in the future. Scenarios are compilations of trends into differing images of the future. These images of the future allow their users to consider a broad range of possibilities. As the cone in Figure 2 indicates, scenarios "bound the uncertainty" of the future by defining what is plausible, and what becomes possible if wildcards were to emerge. The use of scenarios grew significantly in the 1980s in both corporate and community planning, particularly in the U.S. and Europe.

Scenarios can be developed in a variety of ways and in varying degrees of detail. Yet a set of scenarios should be both plausible and challenging. Scenarios provide a powerful opportunity to learn both about the future and about our current thinking - including the assumptions and paradigms that we have become blind to.

Figure 3



Often a set of scenarios will include a "best guess" extrapolation of current trends, along with a more optimistic or "higher growth" alternative, one or more negative scenarios, and one or more "structurally different" scenarios which challenge current thinking at multiple levels. These "structurally different scenarios" increasingly are used to portray more visionary possibilities.

Through the 1980s it was common to develop a set of scenarios which included a "business as usual" or "official" scenario, a "high tech" scenario (often not very different from the business as usual scenario), a "green" or sustainable society scenario, one or more negative scenarios (such as collapse, decline, totalitarian or fundamentalist control - these are the least popular scenarios and are often neglected or ignored although entirely plausible) and a transformative scenario. One of the great values of alternative futures scenarios is their ability to present alternatives that help people clarify their underlying values about society.

Also, by focusing on sets of interacting trends and key underlying themes they may help us understand that the future will likely be a combination of all these futures, something like a mosaic. And like a mosaic, while one "color" may seem to predominate from a distance, closer examination will reveal the multitude of "colors" (futures) that make up the whole.

Figure 4, using titles of the scenarios developed in a recent Institute for Alternative Futures project for The Healthcare Forum, illustrates how a set of scenarios can consider major forces in the larger society and changes in key areas of health care (see the accompanying article). The Institute for Alternative Futures (IAF) catalogues images of the future of society. We believe that, in the long run, health care will parallel the major directions that society takes.

In the scenarios illustrated in Figure 4, health care in the U.S. would move in its current directions to a "Continued Growth/High Tech" future with major biomedical advances, but continuing unequal access to health care and with little done to remove the principal correlate to ill health, namely, poverty. "Hard Times/Government Leadership" envisions continued economic difficulties, a revolt against the health care system, particularly physicians, and a Canadian-like system with more frugal yet universal and still sophisticated care in a society with more commitment. The "Buyer's Market" makes physicians

Figure 4

Scenarios for U.S. Health Care					
scenarios elements	1. Continued/ High Tech	2. Hard Times/ Government Leadership	3. Buyer's Market	4. High Spirit Transformation	5. Healing and Health care
Society and Economy					
National Health Policy					
Factors Increasing/ Decreasing Demands					
Delivery Systems & Hospital Needs				The future of health care can be compared across key elements	
Outcomes/ % of GNP					

and health care providers compete on the basis of their outcomes and removes consumers' tax deductions for basic health care. "High Spirit Transformation" agrees with Alvin Toffler and others that Western Industrial Civilization is in the process of being reborn as something very different. Paradigms in science, technology, society and government will change dramatically. Health care will become more sophisticated, more focused on and directed by the individual, and more concerned with community health. The fifth scenario, "Healing and Health Care" assumes an emerging new civilization, like the fourth, but focuses more on how we will make greater use of our mental, emotional and spiritual capacities in healing.

While the greatest use of health scenarios or alternative futures has been in the U.S. and Europe, as will be explored in more detail in Section 5, this scenario technique has been developed by the Pan American Health Organization (PAHO) in its work for Latin American and Caribbean governments. Nicaragua has developed scenarios exploring its health care system under varying assumptions about structural adjustment policies, economic growth, health conditions, and changes in the health care delivery system.

As illustrated in Figure 4, scenarios allow the simultaneous comparison of a range of key elements. A set of scenarios such as these invites us to think about the relative likelihood of each scenario. It is true that the future is likely to be a mixture of these and other scenarios, but thinking about the relative likelihood of each scenario is important for clarifying our own thinking.

Scenarios also invite us to think about our relative preference - how much I would want to create any one of the scenarios presented. In exercises with public and private sector audiences in North America and Europe and health care providers throughout the U.S. and Canadian health care systems, this comparison typically leads to a paradox.

The scenarios rated most likely scenarios are not the most desirable. This resulting gap between likely and desired, between plausible and preferable future, pose an important issue for planning. Most organizations focus their planning around threats and opportunities in a most narrow range of the probable future. While they can identify more creative, productive futures that they would like to

create, their planning and decision-making processes focus too much on what is, ignoring what ought to be and what could be. They ignore their ability to create new futures - to create new preferred scenarios. This leads to the next futures thinking tool, namely, vision.

4.3 Vision

We think about what "might happen" (plausible futures or scenarios) so we can better shape what we "want to happen"; so that we can invent and create the future we most prefer (our preferred future or vision). Our preferred future is best driven by a vision of what we want to create; our sense of the best that might be.

A vision is a compelling, inspiring statement of the preferred future which the authors and those who subscribe to the vision want to create.

Scenarios are "futures for the head". They provide intelligence, identifying threats and opportunities and stretching our imagination. Visions are "futures for the heart"; they touch and move us.

4.3.1 Visioning in the Public Sector

Some leaders, and some organizations, such as WHO in its Health for All by the Year 2000 campaign have provided visions to inspire and motivate. In the 1980s, the process of visionary leadership increasingly became something to share throughout organizations and communities.

Whereas scenarios increase our flexibility in the face of an uncertain future, visions inspire us by stating what we are working to create, what higher contribution flows from our efforts, and what we could strive to become.

One place in the public sector where visioning processes saw significant growth in the 1980s in the United States was state and local "futures commissions."¹⁴ In the 1960s and 1970s these efforts tended to focus on goals, with some explicit consideration of forecasts. By the early 1980s, scenarios were a common feature of most of these efforts and as a consequence gave these futures projects a better sense of how the future might unfold. Yet in the mid 1980s some of these efforts began to focus on visions as statements about what could be created, about the best that might be. Since 1990, this has been the case in a series for futures commissions and other futures efforts particularly in the judicial branch of state governments in the United States.¹⁵ Likewise in Reinventing Government, one of the best books on important trends within state and local governments in the U.S., authors Ted Gaebler and David Osborne make the point that in virtually all the cases they examined of governments that have dramatically increased their efficiency, a shared vision has played an important role.¹⁶

To the extent that vision activities grow, they are likely to accelerate the movement of societies toward the type of vision WHO has articulated. For example, when hospital groups in the U.S. articulate their visions, these hospitals and hospital associations, such as The Healthcare Forum, explicitly identify and usually commit to visions with a strong community health component. Likewise, in a major vision project in the U.S., a group of leaders from inside and outside of health care authored the "Belmont Vision" for health care. They called for health care reform to be put in the context of creating a healthier society and making explicit the social contract that would guarantee access to health care and recognize the responsibilities that individuals and organizations have to protect and promote health.¹⁷

4.3.2 Visioning in the Private Sector

While vision has grown in the public sector, its use grew even more during the 1980s in the private sector. The importance of vision is noted in the most respected literature on leadership and strategy for large corporations.

For example, Tom Peters and Robert Waterman in their research on excellent companies found that those companies which had a strategic vision that was authentically communicated to their employees could tap a higher level of productivity from employees because it touched their hearts.¹⁸ Waterman, in his book, *The Renewal Factor*, argues that "one of the most difficult challenges in management is developing a sense of value and vision." The way this is done is "by finding a way to give the organization a sense of pride."¹⁹

Burt Nanus in *The Leader's Edge* argues that the vision "should provide a shock of recognition that has the power and intensity to command attention, evoking resonating images in the receiver." How can you do this? Nanus argues that leaders should:

"try to make the vision relate to something familiar in the organizational culture. Be sure that it is credible and easily understood, optimistic and ennobling. Remind people of the tough things that need doing and the reasons for them. Elevate their aspiration. Show them a brighter, more successful future for themselves if the organization achieves its vision. In the end, your vision must provide the spark that ignites their energies and empowers them to move forward together with you toward a shared purpose."²⁰

Likewise Rosabeth Moss Kanter, in her book *The Change Masters*, argues that "great companies make meaning." Inspiring change can be difficult. "Most of the rational analytical tools (used by organizations) measure what already is. ...But change efforts have to mobilize people around what is not yet experienced." Kanter goes on to talk about the environment necessary for change:

"Change masters are - literally - the right people in the right place at the right time. The right people are the ones with the ideas that move beyond the organization's established practice, ideas they can form into visions. The right places are the integrative environments that support innovation, encourage the building of coalitions and teams to support the implement visions. The right times are those moments in the flow of organizational history when it is possible to reconstruct reality on the basis of accumulated innovations to shape a more productive and successful future.

The concepts and visions that drive change must be both inspiring and realistic, based on an assessment of that particular corporation's strengths and traditions. ...All companies can create more of the internal conditions that empower people to carry out the search for those appropriate innovations. And in that search might lie the hope of the American economic future."²¹

Finally, Peter Senge emphasizes that in order for a vision statement to affect positive change, two conditions must be met. First, the vision must be a shared vision, to which members of the organization are committed. They will stretch themselves and the organization to make it happen, creating the conditions necessary. Second, the members of the organization must believe that they can make it happen; "vision becomes a living force only when people truly believe they can shape their future."

"A shared vision is not an idea. It is not even an important idea such as freedom. It is, rather, a force in people's hearts, a force of impressive power. It may be inspired by an idea, but once it goes further - if it is compelling enough to acquire the support of more than one person - then it is no longer an abstraction. It is palpable. People begin to see it as if it exists. Few, if any, forces in human affairs are as powerful as shared vision."²²

4.4 Strategies, Strategic Planning and Vision

One of the key lessons that has emerged from this private sector work is the difference between strategic plans and visions. Both are important for moving forward, but they are not the same. Management consultant Michael Doyle has developed a useful comparison of the two.²³

Strategic Plans

- o Directional
- o Linear
- o Reaction to trends and competition
- o Work forward to the future
- o Have to know how to get there
 - o Completed plan
- o Plan language
 - cool
 - rational
 - mind-focused
 - bureaucratic
- o Secret

Visions

- o End-State Oriented
- o Holistic view/a snapshot
- o Desire to create in the world
- o Work backward from the future
- o Unclear how to get there
- o Dynamically incomplete
- o Vision language
 - hot
 - heart/spirit
 - intuitive
 - poetic
- o Public

Once we have a vision, strategies are needed to focus our efforts on achieving the vision. **Strategies are high level, integrated sets of actions we will take to achieve our vision.** Figure 5 identifies the relationship between scenarios, vision and strategies.

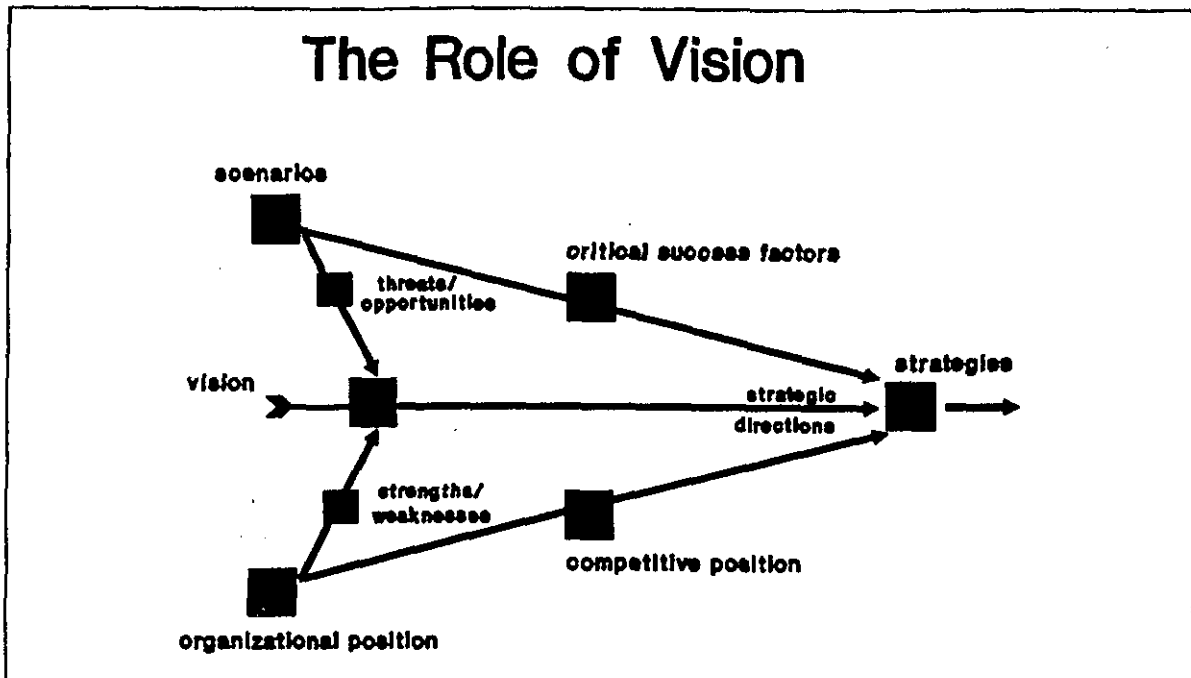
Vision is influenced by the threats and opportunities of the external environment (the top half of Figure 5) best summarized in scenarios. Vision is also guided by factors internal to the organization or the community (its strengths and weaknesses) and its competitive position (the lower half of Figure 5). Strategic planning often includes a SWOT analysis, the strengths and weaknesses of the organization and the opportunities and threats posed by the external environment. Yet effective strategies can be developed to go in several directions. The organization's vision identifies the compelling and inspiring destination (preferable future) the organization is headed toward.

There is a wide range of planning methodologies,²⁴ as well as other policy making tools, such as technology assessment that are closer to being guides to action than trends and scenarios.

4.5 The Contribution of Health Futures

These aspects of health futures - trends, scenarios, visions and strategies - are an integral part, at least implicitly, of most decision making processes. Their power to forge wiser decisions comes when they are made explicit and consciously shared to provoke thinking, stimulate creativity, clarify options, and aid direction setting and commitment.

Figure 5



5. Applying Futures Thinking in Health and Medicine: Selected Illustrations

Using these methodologies, what have health futurists come up with? This section reviews the highlights of some of the key studies in health futures, primarily from North America, focusing on trends, scenarios, vision, and strategies.

5.1 Trends

There are numerous sources of effective trend forecasting efforts. In the late 1970s there was a series of books whose accuracy was directly related to their breadth. The one which was most narrow became the most outdated....²⁵ One forecasting the *Post Physician Era* focused on key trends in the use of computers in medicine.²⁶ While overestimating how quickly change would come, nonetheless it's forecasts still appear to be accurate. Likewise Rick Carlson wrote *The End of Medicine*, anticipating many aspects of the consumer and payer revolt in the 1980s and the more profound changes in the 1990s.²⁷

Roy Amara and his colleagues at the Institute for the Future have produced a variety of studies on the future of health.²⁸ Russell Coile regularly compiles trends in a newsletter and periodically in books.²⁹ The *Institute for Alternative Futures* provides periodic overviews of trends in health and health care.³⁰ Jeff Goldsmith works extensively with the hospital sector and has produced both books and key articles.³¹ In 1992 Goldsmith analyzed the key forecasts in the 1980s that focused on U.S. health care expenditures and, for this area of descriptive forecasts, announced that Lynn Etheridge, at the time on the staff of the Office of Management and Budget, was the most accurate in predicting the high level of growth in health care expenditures in the U.S.³²

Another futures-oriented strategic planning exercise was conducted by Associated Economic Analysts for the Premier's Commission on Future Health Care for Albertans. This report examined a broad range of issues that might affect Alberta, its state of health and its health care system. The topics covered included demographics, economics, technology, cultural change and health trends.

5.2 Scenarios

In the scenario field there are basically two approaches to developing health care scenarios. The first considers the larger social and economic milieu and then considers the patterns of change within health care. These are typified by work throughout the 1980s by the Institute for Alternative Futures,³³ and the Swedish Institute for Future Studies.³⁴ As noted above, these sets of scenarios in the early 1980s typically include a positive extrapolation, status quo or business as usual scenario; a hard times scenario; a sustainable development scenario and another transformative scenario. By the early 1990s the growth of vision led to the conscious inclusion set of transformative scenarios that would be useful for organizations embarking on a vision exercise. For example, the 1992 set developed by the Institute for Alternative Futures for The Healthcare Forum included transformative scenarios that focused on the "New Civilization" (a Toffler-like Third Wave society that emerges and changes paradigms in health care) and "Healing and Health Care" which also assumed a civilization change but emphasizes the interpersonal, spiritual aspects of healing.³⁵

The second approach to scenarios is more focused, often to answer specific questions about key lines of therapy. For example, the Dutch Government's Steering Committee on Future Health Scenarios, STG, has done major scenario projects on several topics, including heart disease³⁶, cancer³⁷ and aging³⁸. They have provided a useful critique to their first five years of efforts using scenarios for governments.³⁹

5.3 Examples of Health Visions

"Where there is no vision, the people perish." (Proverbs 29:18)

One of the earliest - and perhaps still one of the best - attempts to create a vision of a preferable future was carried out by a Toronto health futures group - Paradigm Health - in the early 1980's.⁴⁰ Paradigm Health was an informal group of people connected with the health sector representing a broad range of perspectives - hospitals, family physicians, nurses, health planners, public health and alternative practitioners - who were interested in the future of health. Inspired by the World Future Society's First Global Conference on the Future, which was held in Toronto in 1980, they came together to explore the future of health as a whole and not medical care alone. Using a technique called "the futures wheel"⁴¹ they described three key strategies for achieving their positive vision of health:

- creating an environment conducive to health
- learning the art of wellbeing
- providing essential sick care services available to all

This early work proved to be significant in helping to reorient thinking in Ontario and in Canada away from medical care and towards the future of health.⁴² Their work remains one of the most comprehensive attempts to describe a preferable future for health in Canada. Since then, other "visions" of health have been developed including a lengthy description of the future of health in Alberta⁴³ and a brief vision of health for the Province of Ontario.⁴⁴

Vision has become particularly important in those countries undergoing major health care reform. Health care reform in the U.S. typically focuses on financing and access to health care, along with cost containment. As former U.S. Surgeon General C. Everett Koop put it, "Achieving universal and affordable access to health care won't by itself produce a healthy nation."⁴⁵ To this end Koop and other Americans developed "The Belmont Vision," which describes a preferable future for health.⁴⁶

What characterizes all of these is their insistence on focusing on the future of health and the determinants of health, and in that context focusing on more visionary medical care systems.

A somewhat different approach to vision is illustrated (literally) by Donald McKahan, a California-based architect. In a Masters thesis, he described what a 21st century hospital could/should look like; he has subsequently transformed this into a simple but effective video in which people are taken on a tour of his 21st century hospital/health campus. Likewise, Leland Kaiser has done extensive work with hospitals to reinvent their role, particularly how they can develop their healing capacities and transcend their competitive strategies into more collaborative ones in the local communities.

A broader based application of the vision approach, and one that comes closer to Amara's key attributes for the futures field (creating images of the future and increasing participation) has been developed and applied through the growing healthy cities/communities movement worldwide. A large number of communities have gone through a "vision workshop" process in which groups of anywhere from 15 to 50 community members are taken on a "guided imagery" tour of their community at some point in the future when it is healthy. In small groups, following the guided imagery, they draw what they have seen. What results is a series of delightfully child-like, colorful and simple images of what an ideally healthy community would be like.

What people in North America at least seem to depict, briefly, is a 21st century version of a 19th century European market town: compact, low-rise housing and mixed land use (housing, stores, workplace, recreational and social settings all mixed together compatibly), few if any cars, a social center such as a market square, village green, community garden or plaza, lots of water, trees and flowers and lots of street life.

When six or eight of these drawings are all put at the front of the room and each group describes what is in their drawing, it very quickly becomes apparent what are the common themes that make up the group's collective vision of what their community would be like if it were more healthy. It is then comparatively easy to identify the major themes that need to be addressed and to begin to develop strategies for how to achieve this healthier and more preferable future.⁴⁷

5.4 Strategy

While there has been a comparative dearth of strategic vision, we have not been short of strategic plans. However, from a futures point of view what is important is the combination of strategic vision and strategic planning. As John Naisbitt noted in "Megatrends":

"Strategic planning is worthless - unless there is first a strategic vision."

One good example of futures-oriented strategic planning is the Welsh Health Planning Forum. Part of the National Health Service Directorate of the Welsh office, the forum has been developing a strategic direction for the NHS in Wales, serving a population of 2.8 million people, since 1989. The forum "endeavors to operate at the interface between the leading edge of strategy development and the trailing edge of health futures."⁴⁸ The NHS in Wales adopted a Strategic intent in 1990 that focuses on "putting health needs first, and health services second." The strategy is to be implemented in a decentralized manner, with the development of district plans focusing on local strategies for health. The overall strategy and the district plans are guided by Protocols for Investment in Health Gain, which "indicate which interventions should be supported and increased and those for which efficacy may be questionable and where resources could be released."⁴⁹ These protocols cover cardiovascular disease, cancers, maternal and child health, physical and sensory disability and respiratory disease. For each of these, the issues are identified with respect to health gain, a people-centered service and resource

effectiveness, key issues are identified and the initial steps for action with respect to needs identification, service planning, human and other resources and technology are spelled out.

One example of linking trends, visionary goals, and objectives is "Healthy People 2000", the U.S. National Health Objectives. In effect this represents a vision by joining the various pieces, literally hundreds of objectives. This project has spawned a series of other programs which allow local communities to operationalize their own "Healthy People 2000" objectives. For example, the American Public Health Association and Centers for Disease Control have a "Model Standards" project which enables communities to identify and prioritize their objectives. In reality more like a strategic planning exercise, this project examined the current state of play for a wide variety of health problems and diseases then suggested what were achievable future levels of health status. This was also an attempt to describe a preferable future.

WHO itself has been a pioneer in the movement toward establishing vision, through ideas such as Health For All by the Year 2000, and then by working to develop the strategies to achieve those. The 1991 Saitama Declaration's Call for New Public Health Action typifies this effort to develop integrated patterns of community and organizational strategies that would accelerate the move toward the HFA targets.

6. The Future of Health Futures

6.1 Technology and Vision

The information technology of the years ahead will dramatically enhance the accessibility of good health futures. The ability to create complex yet user friendly simulations on interactive multi-media equipment, along with expert systems for ongoing monitoring of the massive amounts of information that will be available will mean significant potential for advancement for the health futures field.

This could also mean that health futurists will be displaced by technology. To a certain extent this is likely to occur. And disintermediation is generally likely in the service industries (futures research and consulting is part of the service industry, as is all of education). Health futurists will have to find new ways to add value to what they personally can do.

One area where technology will be useful but where human contact and leadership will be important is visionary leadership development. Burt Nanus, for many years the Director of the Center for Futures Research at the University of Southern California, has noted that in his decades of experience with future research he would often have the experience of having his clients develop truly imaginative and ultimately accurate forecasts of the future. However he often found that when these forecasts were threatening to the organization they were ignored. Nanus found that leadership, particularly in moving the organization forward, was essential. This in turn led Nanus to his own focus on the role of vision and leadership.

This need to link trends, scenarios, vision and strategies is essential not only in private companies, but in community settings as well.

How will health futures be judged? It depends in part on which futurist you ask. There is a tension within the health futures field, there are futurists who argue that futures should press the boundary of thinking for its users, and there are others who expect futures to provide easily defensible estimates of near term developments which are useful in implementing existing policies.

Both are appropriate, though we have argued that vision, imagination, creativity is likely to be the area of greatest contribution. It is necessary to develop outcome measures for health futures. Developing measures for how far individuals were pushed beyond their paradigm, how imaginative they became, whether their vision inspired them to create something different, will be hard to measure. Easier to measure will be how close various forecasts and scenarios came to the future as it actually unfolds. Both types of measures and comparisons must be made. More difficult still will be measures of the wisdom of decisions and actions as they are influenced and aided by health futures.

6.2 21st Century Health Systems Project

A relevant question for health futurists is how can we add value to our own work and to the field? One response from the International Health Futures Network is the development of a multiyear Global Project on 21st Century Health Systems. This will combine the best experiments around the globe to reinvent and put in place new and enhanced health care systems with leading health futurists world wide. To catalogue and share the emerging designs for health care, taking full advantage of advanced information technology, and designed to meet the unique needs of advanced city or pre-industrial village, is part of the objective of this project.⁵⁰

7. Conclusion

The application of futures methodologies to the health sector has not been very widespread to date, and where these methods have been applied they have too often focused on attempts to predict and to project trends rather than to develop vision and scenarios. Moreover, they usually have been applied within the narrow context of medical care rather than the wider context of health, and within a narrow professional orbit rather than the wider community setting.

The challenge for health system planners and managers is thus threefold.

- How to further integrate more visionary and scenario-based futures methods with trend, modelling and strategic methods.
- How to address the future of health and its determinants and within that wider framework, consider the future contribution of the medical care system and thus its role and future development.
- How to involve the public in designing the health system and the medical care system of the future.

These challenges need to be taken up not only at the national level but at the regional or local level or even at the level of the individual health care provider or hospital. For example, health care systems should develop a process in collaboration with their community that examines what sort of "healthy community" they want, what the future trends affecting health appear to be (based on an environmental scan) -- what they need to do to become a more healthy community -- and what sort of hospital and medical care system they want and need in such a context.

For its part, WHO can assist national health systems with technical advice and support and can support international organizations such as the International Hospital Federation and the International Health Futures Network in providing information, support and the exchange of experience among local level initiatives and communities.

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3. See: *On Futures for Health and Health Care in Latin America and the Caribbean: Trends, Scenarios, Visions, and Strategies*, Technical Reports Series No. 12, October 1992, Contact Cristina Puentes-Markides, Health Policies Development Program, PAHO/World Health Organization, 525 23rd Street N.W., Washington, DC 20037 Telephone: (202) 861-3218 Fax number: (202)861-2647.
4. Contact Dr. Herbert Zollner, World Health Organization, Regional Office for Europe, 8, Scherfigsvej, 2100 Copenhagen, Denmark. Telephone: 45 31 29 01 11, ext.343/466 Fax number: 45 31 18 11 20.
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6. For more information on the OECD Futures Studies Information Base, contact W. Michalski, Head of the Advisory Unit to the Secretary-General, 2, rue Andre Pascal, 75775 PARIS CEDEX 16. Telephone: 45 24 82 00 or Fax: (33-1)45 24 85 00.
7. For more information from an association of professional and academic futurists, contact the Secretary General of the World Health Futures Studies Federation, Professor Pentti Malaska, c/o Turku School of Economics, Rehtorinpellonkatu 3, sf-20500 Turku, Finland. Telephone: 358-21-638 3310 or Fax: 358-21-330 755. For a group with both professional and popular members, a popular magazine, *The Futurist*, a refereed journal, *Futures Research Quarterly*, and the most cost effective environmental scanning of English language periodicals, Futures Survey, Contact The World Futures Society at 7910 Woodmont Avenue, Suite 450, Bethesda, Maryland 20814. Telephone: (301)656-8274 or Fax: (301)951-0394.
8. Contact Hugues de Jouvenel, Futuribles International, 55 Rue De Varenne, 75007 Paris, France. Telephone: 011-33-1-42-22-63-10 Fax: 011-33-1-42-22-65-54.
9. Contact Dr. Gerhard Kocher, Swiss Society for Futures Research, Haldenweg 10A, CH-3074 Muri, Switzerland. Telephone: 41 31 33 66 55 or Fax number: 41 31 33 68 00.
10. For more information or to join from the Americas or Asia, contact IHFN, Kathryn Johnson, President and CEO, The Healthcare Forum, 830 Market Street, San Francisco, CA 94102. Telephone: (415)421-2411 or Fax: (415)421-8837 or from the rest of the world, contact IHFN Foundation, R. F. Schreuder, P.O. Box 7100, 2701 AC Zoetermeer. Phone: 079-710311 or Fax: 079-510881.
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50. For more information on the IHFN Project on 21st Century Health Systems, or to send in a case for the data base the Project is developing, contact Clement Bezold, Institute for Alternative Futures, 108 North Alfred Street, Alexandria, VA 22314. Fax: 703-684-0640.

Appendix 6

Case studies and tools presented at the Consultation

This appendix provides a brief summary of some of the key features of the studies and tools that were presented at the meeting. They are divided into three sections:

- case studies carried out in particular countries;
- studies of emerging health technology;
- tools for health futures studies.

Where possible references have been given to reports or publications that are publicly available; if no such documents exist, references to unpublished paper are used where available. The people who presented the different studies/tools at the consultation have been given as contacts (their addresses can be found in the list of participants), other useful contacts are provided in Appendix 7.

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CASE STUDIES CARRIED OUT IN PARTICULAR COUNTRIES

Case study: National 21st Century studies - futures studies carried out in a wide range of countries, (see also entry for study 'Peru in the 21st century').

Scope and purpose: Varies from country to country, from projection of the future, through scenario development of alternate futures, to envisioning and empowerment directed at widespread transformation in human beings, organisations and societies. Studies are multisectoral in nature, the sectors included in detail vary, as does the extent to which the health sector is studied.

Methods: Vary from study to study.

Use for policy and decision making: Varies from study to study

Publications/reports:

Garrett M J, Hommel J & Barney K R Eds. (1991) *Studies for the 21st century*. Paris: Institute for 21st Century Studies and UNESCO's Future-Oriented Studies Programme.

Futures 22(4) May 1990. Special issue: National 21st Century Studies.

Presenter: Martha J Garrett

Case study: Brazil - HIV and AIDS modelling and projection

Purpose: Review of current and planned attempts to predict the future patterns of HIV infection and AIDS cases in Brazil, and description of future modelling activities for the Brazilian Ministry of Health.

Methods: Trend projections using a variety of different statistical models. More complex behavioural models to be developed in the future which will enable the evaluation of different health intervention strategies, and which will deal more adequately with population heterogeneity.

Publications/reports:

Castilho E A, Chequer P and Struchiner C J (1992) AIDS no Brasil. *Informe Epidemiologico do SUS* 183: 117-124.

Castilho E A, Struchiner C J and Guimaraes M (1989) *Empirical extrapolation projections of AIDS in Brazil*. Fifth International conference on AIDS.

Castilho E A, Struchiner C J and Guimaraes M (1989) *Estimate of HIV infection prevalence in Brazil*. Fifth International conference on AIDS.

Presenter: Claudio Struchiner

Case study: Canada - The CEPHID modelling project, exploring future health, income and demography of the elderly.

Scope and purpose: CEPHID is a computerized simulation framework designed to allow users to construct and analyze projection scenarios for Canada's ageing population, specifically the joint distribution of health, income and demographic attributes.

Methods: Computer based model using a hybrid of dynamic microsimulation demographic projection models and static ageing methods for income and health attributes.

Use for policy and decision making: Currently undergoing acceptance testing by project sponsors. Policy relevant projections and scenario explorations now being started.

Publications/reports:

Wright R E Ed. (1992) *The CEPHID Modelling Project*. Institute for Research on Public Policy, Canada.

CEPHID Users Manual (1993) *Social and Economic Studies Division*, Statistics Canada, Ottawa.

Presenter: Michael Wolfson

Case study: Indonesia - Future health trends

Scope and purpose: To review past and current activities, trend assessments and other related studies to support the formulation, monitoring and evaluation of Indonesia's Long-Term Health Development Plan. To identify constraining or enabling factors in the effective implementation of past and current activities. To provide input for the formulation of the Second Long Range Health Development Plan (1994/95 - 2018/19). To formulate recommendations for enhancing global and regional trend assessments and other related studies.

Methods: Trend analysis and projection, expert opinion, scenario development. Details of some of these are discussed as a case study in chapter 3.

Use for policy and decision making: Results were influential in shaping the Second Long-Term Health Development Plan (1994/95-2018/19), as well as the Sixth Five Year health Development Plan (1994/95-1998/99). They have also been used for regional health trend assessment. Finally, the study has been important in sensitizing people to the need for trend analysis and the skills required to conduct it.

Publications/reports: The trend assessment of health development in Indonesia: a study for providing basic inputs to the second long term health development plan. Ministry of Health, National Institute of health Research and Development, Jakarta, June 1993. (see also case study in chapter 3).

Presenter: Agus Suwandono

Case study: Korea - Health Resource Allocation Model

Scope and purpose: To support the development of long-term and short-term national health plans by developing a model which can:

- forecast the requirements for health facilities including hospitals at primary secondary and tertiary level;
- select optimum locations for health facilities;
- estimate investment required for building facilities and selection of optimum investment plan;
- forecast health personnel requirements.

Methods: Trend projections. Optimisation of locations using integer programming model.

Use for policy and decision making: Recommendations accepted as basic scheme for development of health care system.

Publications/reports: Young Soo Shin Ed. (1993) Development of Health Resources Allocation Model in Korea. Korea Institute of Health Services Management.

Presenter: Young Soo Shin

Case study: Malaysia - towards the development of a national health plan

Scope and purpose: To formulate an integrated health planning methodology and produce a balanced health plan for the country to meet national policy objectives, thus integrated with national development plan.

Methods: Trend analysis and projection, expert opinion, scenario development

Use for policy and decision making: Discussed in chapter 3

Publications/reports: Project Team. Draft Final Report - National Health Plan Study (unpublished), January 1993.

Presenter: Dato' Dr. Abu Bakar Suleiman

Case study: Mexico - health transition

Scope and purpose: The production of a dynamic, comprehensive framework for priority setting. Scenarios for future health needs are produced as a basis for deriving estimates of resource requirements.

Methods: Working within the 'protracted-polarized' model of epidemiologic transition, trend analysis and projection methods are used to produce alternative scenarios.

Use for policy and decision making: Raised awareness among policy makers of trade offs in terms of policy options and competing risks and their potential effect on health.

Publications/reports:

Bobadilla J L, Frenk J et al (1993) The epidemiologic transition and health priorities. Chapter 3 in: Jamison D T, Mosley W H & Bobadilla J L (Eds.) Disease control priorities in developing countries. New York, Oxford University Press, pp. 51-63.

Presenter: José-Luis Bobadilla

Case study: Netherlands - scenarios for dental practice

Scope and purpose: To provide an insight into developments for oral health care for the Dutch population over the next twenty five years and to enable the exploration of different policy options for concerning oral health care.

Methods: Computer simulation model based on cause-effect relationships within a systems dynamic modelling environment. Sub-models deal with: population (by age and socio-economic group); dental attendance; dental pathology; dental treatment; dental personnel supply.

Use for policy and decision making: Used to simulate a wide range of policy options, and to investigate the implications of possible future changes such as the substitution of dental hygienists for dentists in some tasks.

Used to develop alternative scenarios and policy options corresponding to different sets of laws and regulations, budgets and dental healthcare personnel.

Scenario forecasts of the implication of population ageing and improvement in oral health resulting in increased future requirements for services were instrumental in the recent decision to open a new dental school.

Publications/reports:

Bronkhorst E M, Truin G J, Burgerdijk R C W and Wiersma T (1993) Future scenarios of dental health care: a reconnaissance of the period 1990-2020. Houten/Zaventem, Bohn, Scheltema and Holkema.

Presenter: Reinier Haneveld

Case study: New Zealand - Towards a health system based upon primary health care

Scope and purpose: Reviews the historical process of health service reform in New Zealand, describing the formulation and experimentation with a variety of models for service organization and management, aiming to support the creation of a health system based on primary health care.

Methods: Trend analysis and modelling. Action research into prototypes/pilot projects for service reorganization.

Use for policy and decision making: Gradual implementation of organisational change is taking place.

Publications/reports:

Malcolm L (1993) Towards a health system based upon primary health care: radical health reform in New Zealand. Paper prepared for WHO consultation on "Health Futures: results and methods", 19-23 July 1993.

Presenter: Laurence Malcolm

Case study: Nicaragua - future health scenarios

Scope and purpose: The objectives of the study were to:

- design possible health scenarios emphasizing the organisation of the health services at the beginning of the 21st century, based on health situation and trend assessment;
- explore implications of the preferred future scenario for formulation and implementation of health policies by the social actors involved;
- initiate the systematization of experience in design of future health scenarios to be applied to aspects of service organization, human resource development and analysis of specific health problems.

Methods: Group discussion, document review, discussion workshops, trend analysis, scenario analysis. Throughout emphasis was on working within a framework of democratic and consensual consultation. Further details of some of the methods are discussed as a case study in chapter 3.

Use for policy and decision making: The three different scenarios which resulted from the study are being used to involve political parties in negotiations about constructive action. Further studies to support the design and implementation of such action are now being formulated and will shortly be presented as a proposal to the National Policy Forum.

Publications/reports:

Sanchez A (1993) Future health scenarios in Nicaragua: the health situation and organization of services at the beginning of the 21st century. Paper prepared for WHO consultation on "Health Futures: results and methods", 19-23 July 1993. (see also case study in chapter 3).

Presenter: Angel Sanchez

Case study: Pakistan - the Aga Khan University and alternative health systems development

Scope and purpose: Describes the work of a partnership between the university and government to investigate prototypes for future service provision, guided by foundational ethical values, in support of goals of equity, effectiveness, affordability and community participation, and particularly aimed at the most vulnerable and underprivileged.

Methods: Trend analysis. Action research into prototypes/pilot projects for low-cost accessible service provision. A particular futures component is in 'back-casting' through action research to design measures for building a future that is both desirable and plausible.

Use for policy and decision making: Service prototypes have been implemented. These prototypes serve as a structural basis with the potential for adaptation to support policy formulation and strategy implementation based on research carried out by the university.

Publications/reports:

Lobo M (1993) The Aga Khan University and alternative health systems development. Paper prepared for WHO consultation on "Health Futures: results and methods", 19-23 July 1993. (see also case study in chapter 3)

Presenter: Melvyn Lobo

Case study: Peru - long term development options and strategies for the 21st century

Scope and purpose: To identify long term development options and strategies for Peru, to build consensus on long term objectives and to provide tools for development planning. The study contained five component projects:

- feasible options, an assessment of possible alternative paths for the future socio-economic development of Peru;
- desired futures, the creation of scenarios describing alternative desired future states for the country;
- external factors, an analysis of the main international phenomena that will condition Peruvian development options;

- long term strategies, the identification of long-term strategies required for the country to reach desired future states;
- long-term planning, a study of the relationship between the long-term planning process and short- and medium-term policy making.

Methods: Quantitative projection using trend analysis and spreadsheet simulation models. Social research/visioning of desired futures. Scenario development.

Use for policy and decision making: Succeeded in surfacing issues not considered before, raised awareness of obstacles and options, enabled evaluation of difficulties from different perspectives, providing a basis for development of plans. Sectoral models and their results have been transferred to the National Planning Institute. Public dissemination has taken place through books, short articles and stories, a short TV series and conferences and seminars.

Publications/reports:

Garland G H (1990) Peru in the 21st century - challenges and possibilities. *Futures* 22(4) 375-395.

Presenter: Gonzalo H Garland

Case study: Slovakia - inequalities in health: what are the alternative scenarios?

Scope and purpose: An analysis of the past and current situation in Slovakia to identify the challenges posed by legacies of deteriorating health, environmental damage, distrust of central planning and paternalism.

Methods: Trend and situational analysis.

Use for policy and decision making: First stage in process of policy formulation.

Publications/reports

Rusnak M (1993) Inequalities in health: what are the alternative scenarios for Slovakia. Paper prepared for WHO consultation on

"Health Futures: results and methods", 19-23 July 1993.

Presenter: Martin Rusnak

Case study: United States - the effects of emerging technology on heart disease and care costs

Scope and purpose: The implications of current and emerging technologies for reductions in the incidence of and mortality from heart disease, together with the associated health care costs avoided, was investigated for the US over the time period to the year 2015. The results estimated a 67% reduction in mortality over the period 1987 to 2015, with half of this reduction being due to therapeutic advances.

Methods: Estimates based on the use of a modified form of the Delphi technique, with a small number of experts in the US.

Use for policy and decision making: Report of larger study of which this was a part was used to defend investment in research.

Publications/reports:

Brown R E et al (1991) The value of pharmaceuticals: an assessment of future costs for selected conditions. Washington, Battelle Medical Technology Assessment and Policy Research Centre.

Presenter: Clement Bezold

Case study: United States - physician supply modelling

Scope and purpose: The system of models provides tools to produce forecasts of the supply of physicians at national, State and census region level. National forecasts can be produced by age, gender and country of medical education for total allopathic and osteopathic physicians. For allopathic physicians only, a specialty model is available which produces forecasts by specialty and

activity. There is also a specialty distribution model which simulates the balance of supply and demand for residency positions and allows the exploration of policy options in graduate medical education.

Methods: Standard demographic (stocks and flows) modelling.

Use for policy and decision making: Biennial Reports to Congress on the status of health personnel supply and distribution and on the numbers required to provide adequate medical care for the Nation.

Scenario analyses for the Council on Graduate Medical Education about policies on medical education, leading to specific policy recommendations.

Publications/reports

U.S. Department of Health and Human Services, Public Health Service. Health personnel in the United States 1989: Seventh Report to Congress. March 1990.

U.S. Department of Health and Human Services, Public Health Service. Health personnel in the United States 1991: Eighth Report to Congress. September 1992.

Council on Graduate Medical Education. Third report: improving access to health care through physician workforce reform - directions for the 21st century. U.S. DHHS, Public Health Service, October 1992.

Council on Graduate Medical Education. Fourth report: recommendations for the COGME Third Report. U.S. DHHS, Public Health Service, October 1993.

Kindig D A, Cultice J M and Mullan F (1993) The elusive generalist physician: can we reach a 50% goal. *Journal of the American Medical Association* 270(9): 1069-1073.

Rivo M L and Satcher D (1993) Improving access to health care through physician workforce reform: directions for the 21st century. *Journal of the American Medical Association* 270(9): 1074-1078.

Presenter: Herbert Traxler

EMERGING HEALTH TECHNOLOGY

Field: Emerging technologies relevant to selected conditions: schizophrenia, cataracts, HIV/AIDS and diabetes

Summary: The conditions chosen for presentation were those which present worldwide health problems of some magnitude (these represent a selection from the much broader survey of future trends in clinical treatment, prevention and health promotion possibilities). The following scenarios for future availability of new treatments for selected conditions were identified as likely:

- new drug therapies for treatment of schizophrenia available on line within the next 10-15 years without any of the negative side-effects of the current treatment regimes;
- development of prevention of cataracts within the next ten years through use of antioxidants: ascorbate, tocopherol and carotenoids;
- development of one or more vaccines for HIV infection by the end of the decade, utilization of different points in the life cycle of the HIV virus for intervention possibilities;
- development of childhood 'vaccination' for type 1 diabetes.
- improved prospects for use of laproscopic surgery.

Methods: Scanning of journals, publications of pharmaceutical companies, and utilization of network of expert opinion.

Publications/reports:

Fisher J (1992) Rx2000: breakthroughs in health, medicine and longevity by the year 2000 and beyond. New York, Simon and Schuster.

Presenter: Jeffrey Fisher

Field: Expert system of clinical practice guidelines

Summary: Computer based system offering access to boundary guidelines providing clinicians with a range of treatment plans and resource use, drawn from an expert system containing research, expert, and real world experience of efficient and effective quality medical care. The system enables treatment and resource use decisions made by the clinician to be recorded and, where different from the range of options suggested by the system, for the clinical thinking behind the course of action chosen to be recorded. Clinical reasoning collected in this manner is evaluated and used in the maintenance of each guideline. The system demonstrated currently contains a library of over 450 guidelines.

Publications/reports

Chaiken B P (1993) QualityFIRST™ clinical practice guidelines. Obtainable from presenter.

Presenter: Barry Chaiken

Field: Future laboratory technologies for community care

Summary: The specific objectives of the study were to:

- identify laboratory techniques needing development for use in community care;
- identify factors influencing the diffusion of laboratory technologies;
- demonstrate a method for proactive technology assessment.

The utilisation of modern laboratory technology in community care differs greatly in European countries. However, during this decade an immense diffusion of laboratory technologies is expected to take place. By the year 2000, tests for monitoring long-standing conditions, such as diabetes, and pregnancy tests are the only types expected to be performed routinely at home throughout European countries. The remainder of tests expected to be widely performed in a community setting, are expected to take place in the GP's office, these include testing of chlamydia, cholesterol and allergies.

The rate and means of diffusion depends on the type of laboratory technology. Among factors influencing the use of laboratory technology in community care, the presence of a adequate reimbursement system seems to be the most important, followed by technical factors such as ease of use and fast availability of test results.

Methods: Explorative study of the spectrum of future possibilities in this field, utilising expert opinion collected through interviews and Delphi exercises with 170 experts in 6 European countries, United States and Canada.

Publications/reports

Jorgensen T, van den Bosch W, Green K and Kuyers B (1991) Future laboratory technologies for community care. Report to the Commission of the EC's FAST research programme. FOP 301, Brussels, 1991.

Presenter: Torben Jorgensen

Field: Global trends in use and development of traditional medicine

Summary: Increasing trends have been found in the following:

- resources for traditional medicine in China over the period 1975-1991;
- annual production of traditional Chinese medicine over the period 1985 to 1991 (by a factor of ten);
- consultation with practitioners of herbal medicine, acupuncture, chiropractic and homeopathy in the US;
- annual production of plant-derived medicine in the US over the period 1973 to 1990;
- turnover of European phytopharmaceutical market (annual increase rates in 1989 ranged from 3% in France to 22% in the Netherlands). Phytopharmaceuticals were responsible for 5% of the total pharmaceutical market in Europe in 1989;
- integration of traditional medicine in clinical practice, research and education in some countries.

There has also been publication of studies and clinical trials demonstrating therapeutic results from the use of acupuncture, medicinal plants, and therapies such as Qigong.

Methods: Synthesis of existing studies of trends in utilization. Summary of selected studies relating to efficacy, effectiveness, safety and convenience and low cost of traditional medicines.

Publications/reports:

Zhang X R (1993) Global trends of utilization and development of traditional medicine in the future. Paper prepared for WHO consultation on "Health Futures: results and methods", 19-23 July 1993.

Presenter: X R Zhang

Field: Homeopathy - medicine for the 21st century

Summary: Homeopathic medicine is currently so frequently used by European physicians that it may no longer be appropriate to consider it a part of 'alternative' medicine (39% of French doctors and 20% of German doctors prescribe homeopathic medicines, 42% of British physicians refer patients to homeopathic physicians).

Increasing trends have been found in the following:

- sales of homeopathic medicines in the US increased by 250% over the period 1988 to 1992;
- acceptance and/or use of homeopathic medicines by allopathic practitioners in a wide range of countries;
- countries where insurance schemes and/or the social security system cover the use of homeopathic medicines;
- extent to which medical students receive training in homeopathy.

There has also been publication of studies and clinical trials demonstrating therapeutic results from the use of homeopathic medicine. Studies suggest that the cost of health care associated

with homeopathic medicine is approximately half of that associated with conventional physicians for selected conditions.

Methods: Synthesis of existing studies of trends in utilization. Summary of selected studies relating to efficacy, effectiveness, safety and convenience and cost of homeopathic medicines.

Publications/reports:

Kleijnen J, Knipschild and ter Riet G (1993) Clinical trials of homeopathy. *British Medical Journal* 302: 316-323.

Ullman D (1988) Homeopathy - medicine for the 21st century. *The futurist*. July-August.

Presenter: Dana Ullman

FUTURES TOOL

Artificial neural systems (ANS)

Scope and purpose: The approach is based on the production of a model of an existing system which can be used to make forecasts of the future behaviour of the system when one or more of the inputs change.

Methods: The modelling of a system is carried out using the technique of artificial neural systems (ANS), an approach to computing based on the simulation of biological neurons. An ANS is basically a modelling structure with inputs and outputs. While conventional computer modelling requires explicit definition of the relationships between variables, an ANS develops the relationships through a learning process. After this training process, during which historical information is presented to the ANS, is complete, the system can be used to produce forecasts based upon the learned associations.

Use for policy and decision making: So far, only developed for experimental applications, and not applied in terms of health futures

studies for policy making. Article below contains summary of some health applications.

Publications/reports:

Fenton T R and Roney J P (1993) Forecasting hospital length of stay with artificial neural systems. Technical Report, Information Services, Chedoke-McMaster hospital, Hamilton, Canada.

Presenter: Rick Fenton

Bioforecasting Technology (BFT)

Scope and purpose: Model to explore future scenarios for improvement of health, cost-effectiveness, and effectiveness of resource use in different communities in Japan. The model can explore the effects of future demographic change, socioeconomic and environmental factors, and health system characteristics, (including preventive programmes) on mortality, morbidity, health care and service needs, and resource requirements.

Methods: Purpose built computer based systems prospective pattern recognition model. Data intensive and relies on the availability of detailed individual and community health records, as well as data on current and planned future interventions.

Use for policy and decision making: Model has been used at community level to explore options for future provision of services and prioritise these. They are evaluated against criteria of equity in terms of health status, and resource use and distribution. Optimality is defined by resource expenditure in relation to the health needs of the population in the future.

Publications/reports:

Takeshi Tsubo (1993) The value of bioforecasting in health. Institute of Health Systems Development, Toyko.

Presenter Takeshi Tsubo

Dynamic modelling

Purpose: The approach is based on the production of a simulation model of an existing system which can be used to make forecasts of the future behaviour of the system when one or more of the system's characteristics changes.

Methods: Systems dynamic modelling. Construction of a systems dynamic model proceeds through identification of a 'flow-chart' of the system of concern. This includes identification of the basic 'reservoirs' or 'stocks' in the system, the different 'flows' between them, and the relationships that govern the flows. This basic flow chart is then turned into a computer based model. A variety of software packages are available for use, the one demonstrated was the STELLA software package.

Use for policy and decision making: New York Association of Homes and Services for the Aging, used to explore future scenarios based on different legislative proposals affecting elderly care and nursing homes.

Publications/reports:

Rodat J W and Moldaver M (1991) Using a dynamic systems simulation to project the effects of three policy options on nursing home revenues and Medicaid spending.

Presenter: Michael Moldaver

FUGI model 7.0

Scope and purpose: Model for producing long-term forecast simulations of the world economy, within the constraints of the global environment. Can be used to analyse the world economy or the economies of individual countries or groups of countries within the global system. The world is classified into 180 countries and 80 regional groupings. Four major sub-systems are modelled for each country: environment; development (the economic system); peace and security; human rights. Three different types of economic systems are considered: developed market

economies, developing market economies; and transitional economies (the formerly planned market economies).

Methods: Computer based dynamic simulation model of linear and non-linear simultaneous equations. Different options are available for parameter estimation, depending on data availability and scenarios under investigation.

Use for policy and decision making: UN Secretariat, Department of International Economic and Social Affairs, Projections and Perspective Studies Branch, New York for long term projections and policy simulations of the world economy.

Ministry of International Trade and Industry, Economic Planning Agency and Agency for Science and Technology, Japan

Published reports:

Onishi A (1993) FUGI Global model 7.0. Economic and Financial computing 3(1) 3-67.

Presenter: Akira Onishi

PREVENT model

Scope and purpose: The aim of the model is to help apply existing epidemiological knowledge to decision-making in health policy. It can be used to produce estimates of the health benefits to a population of changes in risk factor prevalence, including in terms of proportional changes in disease-specific incidence and in terms of absolute changes in disease-specific and total mortality. The results of the model can be used to explore different lifestyle scenarios and the effects of different preventive interventions.

Methods: Simulation model. Parameters in the model are derived from a meta-synthesis of international data and theoretical knowledge. The model formulation includes: a time dimension to simulate the reduction in excess risk after cessation of exposure to the risk factor; the possibility that one risk factor affects several diseases and that one disease is affected

by several risk factors; the interaction between the effect of the intervention and the demographic evolution of a dynamic population.

Use for policy and decision making: In the Netherlands, to extrapolate the effects of a regional risk factor intervention project in general practice, at local level to help determine priorities for prevention policy, at the national level for the 'Health Futures' document. In Sweden, at local community health centres to monitor and evaluate prevention efforts. In Italy, within a regional prevention project to make future projections, and to assist in monitoring and evaluation. In Canada, for community health diagnosis. In Wales, to help determine priorities in future cancer policy. Also in use in UK and Denmark.

Publications/reports:

Gunning-Schepers L J (1989) The health benefits of prevention, a simulation approach. Health Policy 12: 1-256.

Gunning-Schepers L J, Barendregt J and van der Maas P (1989) Population interventions reassessed. Lancet i: 479-481.

Gunning-Schepers L J and Barendregt J (1992) Timeless epidemiology or history cannot be ignored. Journal of Clinical Epidemiology 45: 365-377.

Presenter: Jan Barendregt

S-curves

Purpose: The technique searches for manifestations of the 'natural-growth law' (i.e. growth under competition, with survival of the fittest). In its health applications, diseases are assumed to compete with one another, and the competitive relative advantage or disadvantage of different diseases is quantitatively determined and projected into the future based on these 'natural' growth patterns.

Methods: Statistical curve-fitting of S-curves, and use of the Fisher-Pry substitution model as generalized by Nakicenovic at IIASA, Laxenburg, Austria.

Use for policy and decision making: The use of the S-curve to model patterns of comparative growth is already fairly widespread in the modelling of various diffusion and substitution processes (products, services, innovations, technologies, skills), and as such already forms a component of a number of health futures studies. It has yet to find widespread use for forecasting disease growth in the context of health futures studies.

Publicatlons/reports:

Modis T (1992) Predictions: society's telltale signature reveals the past and forecasts the future. New York, Simon and Schuster.

Fisher J C and Pry R H (1971) A simple substitution model of technological change. Technological forecasting and social change 3(1).

Nakicenovic N (1979) Software package for the logistic substitution model. Report RR-79-12. IIASA (International Institute for Applied Systems Analysis), Laxenburg, Austria.

Presenter: Theodore Modis

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