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Sustainability of health care: a framework for analysis

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This paper introduces a conceptual framework which can be used to study the sustainability of health services in developing countries. A health service is considered sustainable when operated by an organizational system with the long-term ability to mobilize and allocate sufficient resources for activities that meet individual or public health needs. The framework includes three clusters: (1) contextual factors, which outline the task and general environment of the services; (2) an activity profile, which describes the services delivered and the activities carried out to deliver them; and (3) organizational capacity, which shows the carrying ability (capability) of the organization in broad terms.

In this framework, health care provision is seen as an open system model where five main factors determine how inputs are converted to outputs, linking them through feedback loops. These factors are aims, technology, structure, culture and process.

The framework has proven useful in analyzing factors critical to sustainability, and in describing structures and processes both in basic public services and in private not-for-profit services. It should also be tested on more complex systems, such as national health care.

Introduction

Since the late 1980s the term 'sustainability' has received considerable attention. A major source of its present definition was the World Commission on Environment and Development 1987 led by Mrs. Gro Harlem Brundtland. Their report states that development is sustainable when 'it meets the needs of the present without compromising the ability of future generations to meet their own needs'. However, when applied to specific individual sectors of society a clearer and more specific definition is needed.

Within the health sectors of a number of low income countries there is currently a search for reforms which would strengthen service delivery and make services more 'sustainable'. The interest in studying sustainability and health development increased with the decline in Third World economies in the 1980s, a development which led to increased debt, economic structural adjustment programmes, and reduced donor funding and government allocations to the health sector, particularly in countries in sub-Saharan Africa (Nabarro 1990; CPHA 1990; Abel-Smith 1992a). This occurred at the same time that the general state of health deteriorated and the AIDS epidemic accelerated.

A wide range of measures have been suggested to increase sustainability: user charges and community management, as reflected in the Bamako Initiative (Mandl et al. 1988); management reforms (Nabarro 1990); designing a public health package and strengthening donor assistance (World Bank 1993); compulsory health insurance for the work force (Abel-Smith 1992b); and increasing effectiveness and minimizing the cost of primary health care (Knippenberg et al. 1990).

Approaches to sustainability

Along with other organizations the World Bank has taken a rather confined approach to sustainability, focusing on financial self-sufficiency. In this regard the Bank has been somewhat concerned with the inequities surrounding the treatment of urban and rural areas (World Bank 1987).

A position paper on sustainability and equity in PHC (Canadian Public Health Association, CPHA, 1990)

argues that the term has been adopted too narrowly in many quarters as the attainment of financial self-sufficiency when foreign funds end. It argues that 'PHC must not only be viewed as a national responsibility, but as an international commitment based on the principles of social justice as set out by the Declaration of Alma Ata'.

In subsequent literature, the focus on economic self-sufficiency has generally been abandoned (Nabarro 1990; LaFond 1991) and the case is made for the long-term commitment of donors. An exception to this is linked to external support of health projects which are expected to phase out at a certain date (De Winter 1993; Stefanini and Ruck 1991/92). These papers deal with aspects of sustainability other than financing, and focus particularly on the strength of the institutional capacity generated by the projects. Nevertheless, many representatives from developing countries express strong concern over the way donors use the term sustainability to provide themselves with an excuse to pull out.

Definitions of sustainability

A UNICEF policy review document (UNICEF 1992) uses a definition of sustainability proposed by the International Development Management Centre (University of Maryland): 'The ability of the system to produce benefits valued sufficiently by users and stakeholders to ensure enough resources to continue activities with long-term benefits'.

The Canadian Public Health Association (CPHA) identifies five main components required to achieve sustainable development: technical sustainability, social sustainability, political sustainability, financial sustainability, and managerial sustainability. UNICEF uses the term cultural sustainability instead of social sustainability (UNICEF 1992). Although similar, the two institutions use the term sustainability in slightly different ways.

Stefanini and Ruck (1991/92) give a definition based on Brinkerhoff (1991) that describes a project as sustainable 'if through the services it delivers it produces outputs . . . which both the local and national community value to such an extent that they are prepared to provide time, resources and political support to sustain them so that long-term outcomes may be achieved'. Thus defined, sustainability and internal performance (the process of transforming inputs into outputs and outcomes according to the criteria of efficiency, effectiveness, and equity) are considered to be the ingredients for a successful project. Three components which should be assessed in determining the sustainability of a project are discussed: a viable organization, managerial and technical expertise, and necessary resources, which offer a framework for measuring indicators. They also note the importance of strengthening the management of existing systems rather than developing parallel systems which detract from already existing ones. Sustainability should not be seen as a static condition, but rather as a process: 'not an end state but an ongoing input-output process' (Stefanini and Ruck 1991/92).

LaFond (1995) uses a definition that addresses the shortcomings of traditional concepts of sustainability: 'The capacity of the health system to function effectively over time with a minimum of external input'. This definition puts less emphasis on donors and more on the national health system. The capacity to secure sufficient resources locally, and the capacity to use resources effectively and efficiently, are identified as basic features. However, because the discussion is focused on poor countries which will continue to rely on external aid, the term *minimum external input* is introduced to the definition, with the notion that a health system may become self-reliant in areas other than financing.

Chen and Singh (1995) systematize different aspects of the concept. *Project sustainability* is viewed in economic terms, focusing on donor withdrawal. *Systems sustainability* includes effectiveness, continuity and mobilization of sufficient resources for financial self-reliance.

Sustainable human development is argued for by Anand and Sen in the *Human Development Report* (UNDP 1994), moving beyond the Brundtland Commission's focus on environmental factors alone, and focusing on the promotion of equity when considering human capabilities. Chen and Singh bring the different aspects together through a framework which emphasizes ownership of explicit goals, political commitment, community participation, human resources, institutional capacity and financial viability.

From the late 1940s it became popular to look at organizations as systems (Von Bertalanffy 1949). The *open system theory* was linked to this development in organizational thinking and the term emerged in early discussions (Von Bertalanffy 1950). Subsequent development of the open-system theory is linked to

Katz and Kahn (1965) who build on the principle that organizations, as biological organisms, are open to the environment and have to adapt to their environment to survive. In a public health paper dealing with the administration of health programmes (Schaffer 1974), the *open system* was used to describe how administrative health systems not only depend on the environment for inputs, but often exist precisely in order to produce outputs for the target population. Thus there is a system–environment interaction operating within external and internal constraints.

The need to integrate different organizational theories is proposed in more recent literature on organization and management (Bolman 1990), integrating the structural, human resource, political and symbolic frame for focusing on different aspects in the life of an organization. A practical guide, *Using the Open System Model* (Harrison 1987), also integrates multiple dimensions of the organization (purposes, culture, behaviour, processes, technology and structure).

A framework for analysis

The approach to sustainability presented here has been developed by various staff at the Centre for Partnership in Development (DiS), but includes elements similar to those of others, such as Chen and Singh (1995) and LaFond (1995).

The starting point for conceptualization is the definition of sustainability suggested in the UNICEF policy review document (UNICEF 1992): 'Sustainability is seen as the ability of the system to produce benefits valued sufficiently by users and stakeholders to ensure enough resources to continue activities with long-term benefits'.

Unlike many other services, health care normally cannot be phased out after a period of time. Certain basic activities/services need to be maintained indefinitely to meet individual or public need. Therefore actors are needed who are organized in such a way that they can be depended on to sustain such services over time, to interact with clients and communities, and to deal with problems and new challenges as they arise. The following definition of sustainability was found useful:

> *A health service is sustainable when operated by an organizational system with the long-term ability to mobilize and allocate sufficient and appropriate resources (manpower, technology, information and finance) for activities that meet individual or public health needs/demands.*

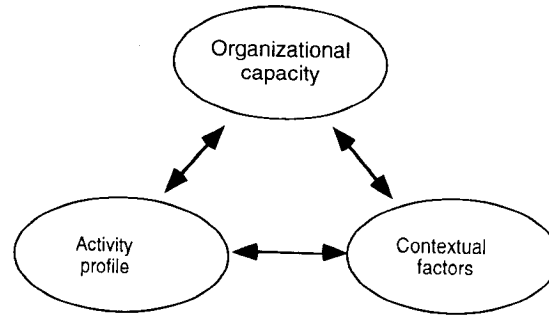

Figure 1. The clusters for analyzing sustainability

It is useful to operationalize the concept of sustainability by grouping the determining factors into three major clusters: context, activity profile and organizational capacity (see Figure 1).

These factors interact with each other in different ways. It is primarily the organization's *ability to produce certain desired activities and support functions (benefits)* which should be sustained. The ability of the health care organization to ensure resources, and the need and demand for services and support functions, are closely linked to the position of clients and stakeholders at the local and the national level. Public policies, the availability of resource input from other levels, and the role of other interrelated systems of decision-makers and providers are factors in the environment (the context of the organization to be studied) that have a strong bearing on sustainability. One must, therefore, study sustainability in relation to accepted assumptions about some of the most important environmental factors. The three major clusters of determinants are briefly described and discussed below (see Figure 2).

Contextual factors

Contextual factors are those factors in the environment which cannot normally be manipulated by the health organization, but which have an impact on the function of health services. Changes in the contextual factors may have a strong impact on the sustainability of a project, and need to be monitored.

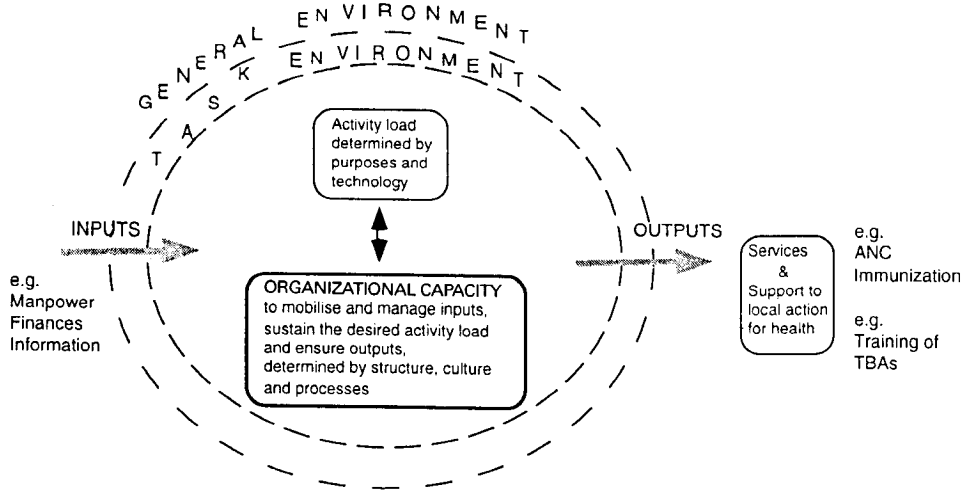

Figure 2. An open system model for studying the sustainability of organizations

Contextual factors may be related to the political and socioeconomic situation, the administrative framework of the country at various levels, the epidemiological realities, etc. Contextual factors can be divided into general and specific factors.

General contextual factors include geographical conditions, climatic conditions, the general political situation (including internal security), democratization processes, major political issues, the government administrative set-up, the government health policy and the policy for cooperation with NGOs and voluntary organizations. Also included is the economic situation comprising government budget allocations for health, structural adjustment programmes, devaluation, economic mechanisms (market regulations and economic institutions), etc. The term *specific contextual factors* refers to environmental factors directly related to health and health services, such as general health conditions, the use and availability of health services and the roles defined for public and private providers.

Activity profile

The activity profile includes the kind of services offered/activities carried out, the choices made reflecting the technology and level of care, the volume of work, etc. It is the decisions made relating to the activity profile that largely determine the load on the health care organization, and thereby the organizational capacity required. Choices are generally based on the perceived needs and resources available, and may be more or less relevant or appropriate. With unlimited access to personnel and financial resources, there is a broad range of options available in terms of the type and volume of services, and the level of care that could be offered. Actual choices are often strongly influenced by the skills and interests of key decision-makers, as well as the overall availability of resources.

Organizational capacity

The organizational capacity represents the capability to carry out a set of tasks faced by the organization. The aims of the organization (such as policies/values, nature of services and their distribution), the required technology and the demand determine the nature of the load. Both load and capacity are influenced by the task environment, and also by the general environment. Included in the organizational capacity are also: structure (decision-making processes, division of labour, roles, coordination of work, etc.); institutional values and behaviour, i.e. the culture of the organization (shared values, beliefs, loyalties, etc.); manpower (encouraging personnel development through in-service training, delegation of responsibility and authority, rewarding through promotion, salary raises, recognition, etc.); leadership (visions,

goal setting, planning, evaluation, decision making, conflict handling, etc.); and resource mobilization and financial management.

The system is sustainable when it has the capacity to initiate desired changes, or adapt to changes in demand or in environmental conditions, while ensuring resources and desired output. The required organizational capacity in a given context will largely be determined by the choice of activity profile, but also by the kind of organizational linkages and relationships established, and the kind of structure chosen. This entails personnel and economic management, planning systems, logistics, decision-making systems, flow of information, institutional development, creativity and external relations.

In studying sustainability an *open system model* is used (Katz and Kahn 1965), as mentioned above. Briefly, the model builds on the principle that organizations are 'open' to the environment and must adapt to their environment to survive. Schaffer (1974) refers to the 'open system', describing how administrative health systems both depend on the environment for inputs and produce outputs for the target population; thus there is a system–environment interaction operating within external and internal constraints.

Five main factors determine how health care organizations convert inputs into outputs and link them through feedback loops: aims, technology, structure, culture and process.

> *The system is sustainable when it has the capacity to initiate desired changes, or adapt to changes in demand or in environmental conditions while ensuring resources and desired output.*

It is essential that the system and the services maintain an adequate level of quality. Underlying values such as appropriateness, efficiency, equity, effectiveness, acceptability, accessibility, and affordability are integral characteristics of different parts of a health care system of sufficient 'quality'. These values create the framework for analyzing demand and need, and determine the nature of the activities to be sustained.

Factors critical to sustainability

A balance needs to be found between the contextual factors, the organizational capacity and the activities carried out in order to obtain a sustainable delivery of services.

> *Health services can be considered reasonably sustainable if there is a correlation between activities and capacity within a given context over a period of time.*

The cluster model illustrates this, since changes in one set of factors must be met by changes in others in order to sustain the services. It is the ability to adjust for such changes that determines the sustainability of the health services.

Ideally this framework should be used to identify all factors influencing the organization's ability to provide health services to a given target group. However, this requires wide and detailed knowledge of the situation, and also of the potential effect of changes. It has proven more efficient to identify the *critical* or *minimum factors* required to sustain the services.

Inherent in this is also a balance between short-term and long-term considerations and goals. When purely short-term considerations are made, improvement of output indicators is emphasized, while long-term goals and considerations would stress improvement of capacity (UNICEF 1995).

Private not-for-profit services

In order to be applied to the private not-for-profit health services, such as mission or NGO health services, the framework needs some adjustment. These types of services are often described as supplementary to the public sector, but in fact may often be the only alternatives for a given target population and are thus not a supplement.

In the private not-for-profit sector, the organizational system includes not only the health unit structure, but also the support functions, some sort of governing board, other units within the organization, and in the case of missions, the foreign or sending body and its representatives. This is illustrated in Figure 3.

The relationship between the regional and national organizations for health care and the district authorities/system needs to be included and studied as part of the task environment. This also applies to private for-profit and not-for-profit service providers who may be partners of the government in the broader district health system. Sufficient capacity for

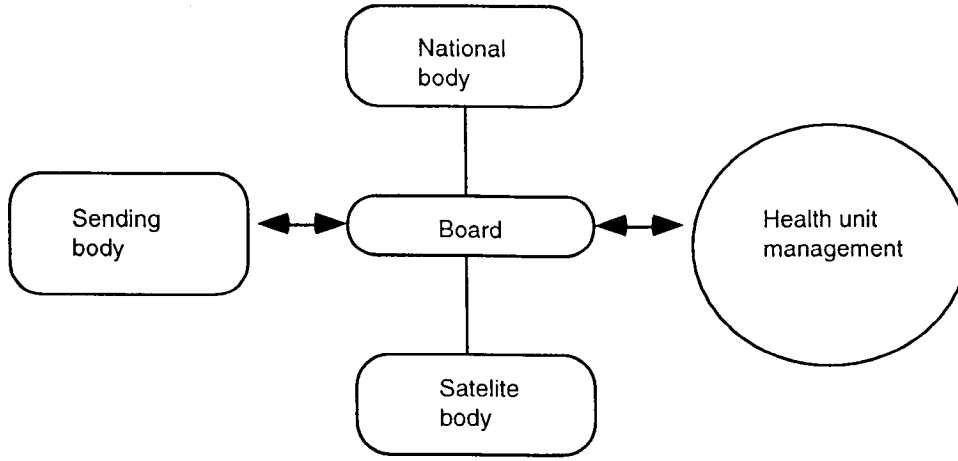

Figure 3. The organizational system, private not-for-profit services

coordination and regulation at the central and the district level is necessary to achieve an optimal mix between private and public providers.

In this process the continued delivery of services may be difficult and sometimes impossible to maintain. Sometimes the only choice may be to discontinue the health services. Frequently though, by adjusting either the services/activity profile, the organizational capacity, or in the long run, even certain environmental factors, more sustainable health services can be achieved.

In a localization process it has been found useful to develop and apply a combination of approaches, each focusing on different factors.

(i) structural relationship between involved organizations;

(ii) transfer of decision-making power;

(iii) cluster model for assessing sustainability.

In considering structural relationships two important changes have been identified as vital, *the allocation of finances*, and *the provision of expatriate personnel*. Another important issue in the process is the transfer of *immovable property*.

Power, in terms of policy and managerial choices, may not necessarily follow finances or personnel, but most often the two go together. An external agency may want to be in control as long as their money or personnel are involved. On the other hand, the development of the concept of partnership, institution building and joint action does imply that a transfer of power in many cases can and should precede the phasing out of external resource inputs. Building appropriate institutional capacity for full takeover is a necessary activity.

The close link between localization and sustainability is obvious. Localization, in the sense of handing over responsibility for certain activities, is no development achievement unless the activities can be sustained under the new ownership and administration.

Basic public services

To be applied to basic public services the conceptual framework needs some other adjustments. More specifically, it may be applied to public primary health care services such as the district health system with the health unit as the focal point, or to community health services.

The organization to be studied may be seen as an *organizational system* which is in itself a rather complex entity. In a public health care system, the organizational system consists of not only the health units, but also the specific support system established to ensure resource input and supervision, as well as the local community structures and mechanisms involved.

The capacity of the organizational system may be assessed in relation to the activity load and the output of services and to its support of local health activities. Selected services are examined in terms of appropriateness, effectiveness and equity. The support of local health activities is assessed in terms of its relevance and responsiveness to health needs and demand, and to its effectiveness in stimulating action.

When distinguishing between organizational capacity and contextual factors it has proven beneficial to differentiate between the actors involved. The elements of the organizational system, based on co-management, are shown as interrelated sub-systems:

- a technical sub-system within the health sector
- a technical sub-system with actors from other technical departments
- a political sub-system
- an administrative sub-system
- various community sub-systems.

In each context, there is a need to define the actual boundaries of the organizational system, based on the given formal structure, tasks, and purposes. Figure 4 illustrates the organizational system for district health services.

In a *district health system with the health unit as the focal point*, the district health team, often headed by the district medical officer, is part of the technical sub-system, as are the staff in the health unit itself. The administrative sub-system consists of the bureaucrats at various levels, whereas the political sub-system is the politicians and their committees. At the health unit level, the management/health committee may be administrative, political, technical or a mixture of these.

In using a *community health service* as the starting point it is useful to reverse the open system model and put the communities' capacity to produce certain desired outputs in the centre of the model.

Strengths and weaknesses of the approach

Studying sustainability in an open systems model has proven to be useful in the analysis of activities and processes. Analyzing factors in clusters is beneficial in identifying factors critical to sustainability. In studying simple health care systems, like those of the private not-for-profit sector, the approach can be easily adopted if viewed in relation to an open system model, whereas for studying NGO/mission programmes which are in a transitional stage, the approach requires supplementary tools and models to be fully operational.

In analyzing more complex systems, such as public health delivery systems at district to local level, it may also be useful to use this approach, with some adjustments. The approach can have advantages as a basis for thought, but it may prove difficult to use on large systems with many different levels and types of services.

Identifying critical factors, however, is a complex process that requires quite detailed information, not only on the different organizational processes and resources available, but also on communities and contextual factors in general.

One limitation of the approach is the difficulty involved in analyzing the goals and objectives of the health service provision. This can be done to a certain degree, e.g. by analyzing equity or efficiency, or by testing out whether certain standards for the activity profile etc. are in place, but has so far been given only limited treatment.

The various factors are interrelated and are likely to change over time, with major implications for other factors. Thus the whole picture is extremely complex. By combining the determining factors into groups or clusters, their interrelationships can also be explored. Any of the clusters may be used as starting points for the analysis.

Of major importance is the interrelationship between factors in the three clusters. It is thus possible to use the cluster model as a way of testing a project plan in terms of its potential for sustainability. The most critical factors making up each cluster obviously

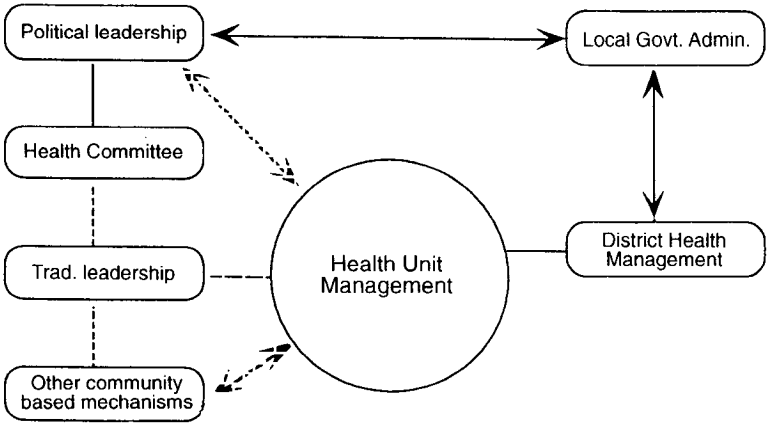

Figure 4. The organizational system for district health services

differ from one type of project to another, depending on the nature of the operation.

Although historical data may be useful for understanding the present situation, the concept of sustainability, and tools for studying it, are based on the identification of factors at a *specific point in time*. The framework is thus not dynamic. It is possible to compare two different points in time, but the availability of concise historical data is normally low.

The approach is not well suited to the analysis of complex processes, but it does assist in the grouping of cross sectional data which can be compared to data from either other time periods or comparable projects. Collecting and analyzing data of this type requires both experience and substantial resources. As the factors are often interrelated, it can be difficult to distinguish between cause and results. This is a chicken and egg situation, and may to a certain degree be similar to that described in relation to public sector services, where factors may be detrimentally negative or synergetically beneficial.

In conclusion, the framework may be a useful tool in analyzing factors critical to sustainability and also in describing the structures and processes involved.

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Biography

Ingvar Theo Olsen, *Cand. Polit.* in economics, is a health economist at the Centre for Partnership in Development (DiS) in Oslo. His main field of interest is micro-economic issues in the health sector in developing countries, primarily research on user fees, costs, efficiency and affordability both in the private not-for-profit and the public sector. He has done research on the financing and efficiency of mission hospitals in Nepal and Cameroon, and he has been the co-ordinator of a UNICEF-financed research project on the sustainability of health systems in Uganda and Ethiopia, carried out in collaboration with the Institute of Public Health at Makerere University (Uganda) and the Jimma Institute of Health Sciences (Ethiopia). In addition to consultancy work he is currently co-ordinating a collaborative programme on the health sectors of Norway and Botswana.

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