Health Status Indicators in Developing Countries

A Selective Review 1986

Commonwealth Secretariat

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A Report prepared for the Commonwealth Secretariat

by

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The views expressed in this report are those of the consultant, and should not be taken necessarily to reflect those of the Commonwealth Secretariat

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SUMMARY

This study was undertaken to provide some insights into the subject of health status indicators. In order to narrow the focus within this expansive and expanding field, the discussion addresses two inter-related issues which are currently of concern to ministries of health in many developing countries: namely, the evaluation of the impact on the health status of the population of primary health care programmes and the inadequacies of the existing information and methods with which to achieve this. The role of health status indicators both as tools for impact evaluation and as aids in the rationalization of statistical systems form major themes in this report.

The recent literature reveals a wide diversity of interest and reflects the multiple uses for indicators. The apparent overlap between the health indicators and the social indicators 'movements' may be related to the adoption of a broader concept of health which includes social, economic and mental as well as physical 'well-being'. This broader concept is clearly central to primary health care.

The issues related to health status indicators which are currently of concern are, not surprisingly, rather different in the developed and developing countries. In the former, attention has tended to focus on, for example, the importance of validity, on measures of positive as well as negative health, on the construction of composite indexes, and on indicators of disability, discomfort and dissatisfaction. By contrast, the concern of many of the developing countries has centred on the policy relevance of specific health status indicators, on the technical, financial and operational feasibility of collecting the neccessary information, and on the question of reliability, sensitivity and specificity of mortality and morbidity indicators. Recognition of the decreasing relevance of the latter two as outcome measures for the assessment of health services in the developed countries represents another point of departure.

Further examination of the recent literature reveals a number of international organizations actively promoting the use of health status indicators as tools for monitoring and evaluating broadly- or narrowly-defined 'health' policies and programmes. These organizations have all produced general guidelines in this area.

Four country case-studies provide some insights into the strategies for implementing primary health care, the existing information systems, and the constraints on the evaluation of impact. The diversity of needs and resources demonstrated by these examples support the claim that there can be no universally relevant and feasible set of health status indicators. There is, however, much common ground between them with regard to the nature - if not the scale - of the health concerns, the approaches to improving the situation, and the need to select a small number of appropriate and mutually-supportive outcome measures. Evaluation in all four countries has typically focused on the operational aspects of health programmes with a consequent emphasis on process indicators. However with improvements in the quality and coverage of services, the relevance of outcome evaluation increases and this has helped to reinforce the demand for simple, low cost approaches to gathering appropriate and reliable information.

The selection and construction of health status indicators in developing countries may be guided by key questions on the level and type of uses and users, on the existing information and sources, and on the feasibility of using, modifying or adding-to these sources. The report contains examples of these guiding questions and illustrates their use for the case of The Gambia.

The study concludes with some recommendations for action. The appendices include an annotated bibliography of useful references, and examples of some of the health status indicators which have been put forward by various governments and agencies.

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LIST OF ABBREVIATIONS

ALRTI	Acute Lower Respiratory Tract Infection
BBS	Bangladesh Bureau of Statistics
CDD	Control of Diarrhoeal Diseases
CHN	Community Health Nurse
CHW	Community Health Worker
EPI	Expanded Programme on Immunization
HFA/2000	Health for All by the Year 2000
HSATAP	Health Situation and Trend Assessment Programme (WHO)
ICDDR-B	International Centre for Diarrhoeal Diseases Research - Bangladesh
IMR	Infant Mortality Rate
LBW	Low Birth Weight
LSHTM	London School of Hygiene and Tropical Medicine
MCH	Maternal and Child Health
MCH-FP	Maternal and Child Health - Family Planning
MHD-G	Medical and Health Department - The Gambia
MHLSW-G	Ministry of Health, Labour and Social Welfare - The Gambia
MHMS-SI	Ministry of Health and Medical Services - The Solomon Islands
MHPC-B	Ministry of Health and Population Control - Bangladesh
MOH-M	Ministry of Health - Malaysia
MOH-S	Ministry of Health - Sierra Leone
MRC	Medical Research Council (Great Britain)
NFPB	National Family Planning Board
OECD	Organization for Economic Co-operation and Development
ORT	Oral Rehydration Therapy
PHC	Primary Health Care
RHT	Regional Health Team (The Gambia)
SEAMIC	South-East Asian Medical Information Centre
TBA	Traditional Birth Attendant
UN	United Nations
UNDP	United Nations Development Programme
UNFPA	United Nations Fund for Population Activities
UNHSCP	United Nations Household Survey Capability Programme
UNICEF	United Nations Children's Fund
UNSO	United Nations Statistical Office
VHW	Village Health Worker
WHO	World Health Organization

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INTRODUCTION

1. At the Seventh Commonwealth Health Ministers Meeting in Canada in 1983, the following recommendation was made:

> "Resources should be concentrated on a selected number of primary health care activities, the choice being determined by the following criteria:
>
> a). epidemiologically significant problems;
> b). problems for which effective interventions are available;
> c). interventions which are affordable and technically manageable" (p.8 of the Report).

This study is associated with the former two criteria but moves beyond the question of resource allocation. The focus here is on a related question: 'Have the selected interventions in fact been effective in reducing the epidemiologically significant problems?'. Or in other words: 'Have the selected primary health care activities had an impact on the health status of the population?'.

2. In January 1986, the Commonwealth Secretariat invited the Working Group on Health Impact Assessment at the London School of Hygiene and Tropical Medicine to prepare a report for the Eighth Commonwealth Health Ministers Meeting. The subject of the report was to be the role of health status indicators in primary health care (PHC). More specifically, the objectives were to:

> a). review the literature on health status indicators;
>
> b). consider recent international, regional and national initiatives with regard to health status indicators;
>
> c). suggest practical guidelines for the selection and use of health status indicators for the assessment of the impact of PHC in developing countries.

Justification of the scope of the study

3. The study may be justified partly as a response to the need to evaluate health services which has developed largely over the last thirty years, stimulated by the greater awareness of the limited and limiting resources available. Within the field of evaluation, the study focuses on a theme which has received increasing interest and concern in recent years, namely the assessment of impact rather than the inputs and operational performance of the health services.

4. In the past, evaluation tended to rely on intuition and on subjective assessments of whether a health programme was effective. The so-called 'quantitative revolution' has contributed to the increasing emphasis on statistical approaches and measurement and on the need for quantitative rather than subjective evaluation procedures. This study considers the use of 'indicators' as simple statistical tools. It therefore has relevance to the continuing demand for improved health information systems and for the development of minimal data sets.

5. Although the developed countries are clearly concerned to evaluate the impact of their health services and to develop appropriate indicators, the study here has chosen to concentrate on the less developed countries. Not only are there obvious differences between these two groups of countries with regard to available resources and to disease patterns but also in terms of the approach and the emphasis in the delivery of health care. For these reasons, it is not simply a question of adapting or scaling-down the health measures and techniques developed in the richer countries to suit the conditions of the poorer countries. Moreover, the extensive research on health indicators which has been carried out in the developed countries, whilst well-documented, is not always readily accessible to the developing nations. Thus, although the study attempts to draw out some of the most important lessons from this research, and includes some of the key references in the bibliography, it was felt that the emphasis should be on issues most relevant to the less priviledged countries of the Commonwealth.

6. The commitment towards the implementation of PHC as a national priority was endorsed in the Seventh Commonwealth Health Ministers Meeting, during which it was noted that:

> "The primary health care literature has given increasing attention to evaluation as goals, objectives and strategies have been more clearly defined"
> (p.231 of the Report)

Although preventive health services, which clearly form a major component of PHC , have always tended to be assessed more thoroughly than curative or rehabilitive services, there are a number of measurement-related issues peculiar to the integrated nature of PHC activities.

7. The field of health status indicators is extremely broad and the literature diverse, due in part to the multi-disciplinary interest in the subject. Much of the work, however, appears to suffer from a lack of focus because the objectives, criteria and definitions are rarely made explicit. This study adopts a more focused approach by addressing the specific issue of indicators for impact assessment.

8. The aim here is to produce a document of interest to health planners, statisticians and other health professionals who may have call to develop and use health status indicators. The need for general guidance in this area has been expressed at many levels. However, the sheer diversity of local, district and national circumstances in which indicators may be called into play, makes it unrealistic and inappropriate to present a list for universal use. Instead it seems more prudent to provide insights into some of the key questions which need to be answered and to demonstrate how this strengthens the potential users' ability to select and apply the indicators most appropriate to their needs and situation. A similar approach was successfully used almost a decade ago in Leowski's (1978) study which illustrates the potential range of useful indicators for a number of 'scenarios' each built around a typical set of health problems and solutions.

How the study was done

9. The study commenced in February 1986. Ideally it would have included visits to a small number of Commonwealth countries to learn of their experiences in the selection and use of health status indicators in PHC. However, budgetary and time constraints precluded this. Similarly, the idea of obtaining these details from ministries of health by means of a postal questionnaire did not seem realistic nor feasible given the six month period in which the report was to be completed. The study has therefore had to rely on sources of information which can easily be exploited from a London base. Extensive use was made of library facilities (Appendix I) and of the contacts and experience at the London School of Hygiene and Tropical Medicine (LSHTM) with developing countries and international agencies. Whilst every effort was made to identify and acquire all relevant published materials, this should still be regarded as a selective review. The study treads on much new ground and, as such, necessarily raises as many questions as it attempts to answer. The value of this report will ultimately be judged by its ability to increase awareness of the issues related to health status indicators and to generate an exchange of ideas and experience between the countries of the Commonwealth.

10. After this brief introduction, there is a discussion of the scope and the nature of the literature on health status indicators. The development of the wider 'health indicator movement' is considered, followed by the ever controversial issue of definitions and then the uses and users of indicators, more specifically in the evaluation of impact. This is followed by a brief description of a selection of relevant international and regional activities. Four country studies are presented next to illustrate some of the national strategies for implementing PHC and the constraints on evaluation and the use of indicators. The lessons learned both from the international, regional and national activities and from the literature review, are used to draw-up preliminary check-lists of relevant questions to guide the selection and use of health status indicators for impact assessment. The application of these questions is then demonstrated for the case of The Gambia. The conclusions to the study follows next, and the final section presents some recommendations for action.

HEALTH STATUS INDICATORS

The 'health indicator movement'

11. Although the search for 'objective' measures of the health status of a population has a long tradition in public health and demography (Hansluwka, 1985), it is essentially within the last two decades that the significant upsurge in interest has taken place. It may be useful here to distinguish between two different components of this trend:

a). firstly an emphasis on 'social' indicators including those which are related to health, for example life expectancy;

b). secondly an emphasis on 'health' indicators including those which closely reflect socio-economic conditions, for example nutritional status, as well as those concerned with the provision of health care; health **status** indicators are thus a sub-set of a wider group.

12. The origin of the field of social indicators appears to lie partly with the efforts to develop a system of 'social accounts' which would transcend the traditional measures of regional and national well-being by incorporating indicators of the 'quality of life' (Culyer, 1983). Much of this early work can be traced back to the 1950's to the United Nations and the efforts continue today with the UN Statistical Office's programme for building and refining a comprehensive framework for social statistics (Murnaghan, 1981)

13. Another active international group which has promoted the development of social indicators is the Organization for Economic Co-operation and Development (OECD), whose 'social indicator programme', launched in the early 1970's, includes health as one of the 'primary goal areas' in which there are 'fundamental social concerns ' (Jazairi, 1976; OECD, 1982). The recent initiatives taken by the OECD will be returned to in a later section (para. 57).

14. The important point here is to stress that the development of health status indicators cannot be credited solely to the efforts of a narrowly-defined health sector and, perhaps more importantly, that future progress undoubtedly lies in a broad inter-sectoral approach. It is now widely appreciated that health ministries in developing countries often have only sufficient funds and expertise to collect the bare minimum of health data. For many purposes, including impact evaluation, ministries will find it more cost-effective and efficient to collaborate with other sectors in information-gathering than to operate independently, as will become apparent in the following pages.

15. Recently, there has been a rapid convergence of the social and health indicator movements in terms of practice if not in theory. The pioneering work in the latter movement originated back in the 1930's with the Health Organization of the League of Nations publishing a comprehensive review of 'indices of health' (Stouman and Falk, 1936). However, it was in the early 1970's that a renewed interest emerged.

Patrick and Guttmacher (1983) suggest there are four principal reasons for this in the context of the **developed** countries:

a). the realization that death rates are no longer sensitive measures of health status, since they have declined to such a level that the margins for improvement are small and consequently the changes occurring difficult to detect;

b). the growing complexity of health care services and technology, with a need for new outcome indicators;

c). the rapid rise in health expenditure and the desire to examine the impact of cost-cutting exercises on the health status of the population;

d). the expanded role of government in health policy and in service provision with the need for health status measures to assist with resource allocation.

16. The impetus for the interest in health indicators in the developing countries has been somewhat different. Although there has been a similar concern to evaluate the cost-effectiveness of health programmes and a need to develop new outcome measures, this has largely been in the context of essentially simple, low-cost and appropriate technology and of planning from the 'bottom up' rather than 'top down' as part of the PHC approach. Similarly, in the developing countries there is little question of the continuing value of mortality rates and, as one author has stated, it would be difficult to think of more relevant and efficient measures of health status (Murnaghan, 1981).

17. One of the major initiators of the health indicator movement in the developing countries has been the adoption of PHC, following the Alma Ata Declaration of 1978, as the key to achieving the goal of 'Health for All by the Year 2000' (HFA/2000) (WHO, 1978). The World Health Organization, as the major proponent of this goal, has actively promoted the use of indicators as a means of monitoring progress at the national, regional and global levels (WHO, 1981a). This significant initiative will be discussed in further detail later (para. 61).

18. Having briefly considered the origins of the interest in health indicators, it is worth reflecting on some of the issues currently receiving attention.

19. Firstly, efforts to develop a single composite measure, or index, of the health status of a population have long been in evidence. The 'heyday' of these activities seems to have been in the 1970's with the most well-known of the mathematical approaches including Chiang and Cohen (1973), Fanshel and Bush (1970), Miller (1973), and Sullivan (1973). Such was the interest in this topic that the United States National Centre for Health Statistics set-up a Clearinghouse for Health Indexes in 1972 to promote the development of composite measures. This unit continues to publish, every quarter, useful Bibliographies on Health Indexes (US Department of Health and Human Services, 1973; Erickson, 1976). Although research continues in this field, there now appears to be a general sceptism both of the feasibility of combining mortality and morbidity in a single index and of the usefulness and policy relevance of doing so, more especially for the developing countries. Reviews of this field and its problems can be found in Elinson and Siegmann (1976), Jazairi (1976), and Culyer (1983).

20. Secondly, within the wider health indicator movement there appears to be a growing debate on the use of actual (patients) or potential (community) consumers of health care to provide self-assessments of health status which can be employed to construct indicators, or an index, for the population as well as for the individual (Bergner, et al, 1976; Ware, 1976). A related development has been the use of patient satisfaction as a means of evaluating the outcome of health care, as reviewed by Kelman (1976) and Holland (1983). These two issues should be seen as part of the general realization that the providers of health care are not necessarily an unbiased objective source of information for establishing the health status of the population.

21. Thirdly, a related topic at the centre of attention is the fundamental question of what Hansluwka (1985) refers to as the 'subject of measurement: ill-health vis positive health'. The emphasis in the development of health status indicators has originally been on the presence or absence of a diseased state. These traditional ill-health or negative health measures are based on mortality and morbidity. In recent years, however, there has been an increasing interest in the possibility of assessing optimum or positive health. Catford (1983) has reviewed this trend and stresses the importance of:

a). the emergence of the concept of health status as a continuum, from well-being to death;

b). new approaches to health care, including PHC, which involve the greater participation of the population in choices affecting their health;

c). more holistic attitudes towards health which allow for a broader range of influencing factors beyond the provision of preventive and curative services.

22. Finally, the current state of the health indicator movement is characterized by its diversity (Culyer, 1983) - some would say chaos. The literature is now vast and the contributions increasingly selective as workers try to grapple with the numerous conceptual and measurement-related problems. Some authors argue that many of the unsolved debates are symptomatic of the fundamental problem caused by the lack of operational definitions of health (Bice, 1976; Schroeder, 1983), as now to be discussed.

The controversial issue of definitions

23. Whilst there are undoubtedly 'diminishing returns' involved in most discussions of definitions, in the context of health indicators, the need to be explicit about the intended meaning of three key terms is particularly important. The concern here has been to be consistent with the consensus in the literature. However, a consensus is lacking in the case of the term 'health'. The discussion therefore introduces some of the grounds for disagreement, whilst taking comfort in Jazairi's (1976) claim that it is not important, at least in developing health indicators, to know what health 'really is'.

Health Indicators

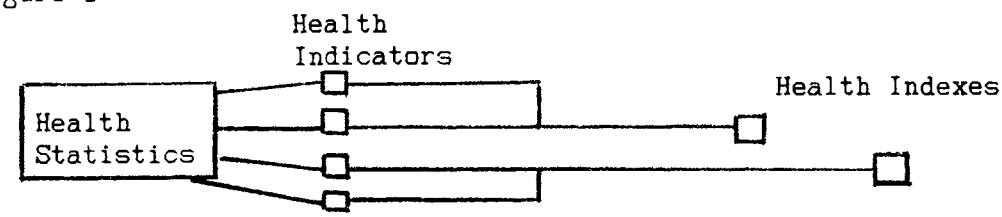
24. Clearly, the term 'indicator' can be used in a colloquial sense, often based on the dictionary definition - 'to indicate'. As Culyer (1983) points out, the idea of a health indicator is deceptively simple.

However, examination of the literature reveals the term being used to refer to measures of very different complexity and content, as seen in the 11 examples of definitions presented by Hansluwka (1985). This diversity can be largely related to the wide variety of purposes and uses for indicators.

25. It is important to point out here that confusion often arises from the use of the generic term 'health indicators' synonymously with 'health status indicators' - as an indication of the level of health or, more usually, the lack of it (see for example Culyer, 1983). On other occasions, a broader interpretation may be employed (see for example Bice, 1976). In the latter case, 'health indicators' may include all indicators which are related to health, such as those reflecting the health services (eg. number of persons per doctor), those reflecting influences on health (eg. percentage of households with treated water), as well as those more specifically indicating the health status of the population (eg. infant mortality rate). This broader definition is the one favoured in this report. Ultimately it is the context in which the word 'indicator' is used which helps to clarify its definition. Thus, for example, whilst WHO (1981a) adopts what at first appears as a simple exposition - 'indicators are variables which help to measure change' - this is more clearly understood in the context of the intended use of these indicators to monitor or evaluate progress in the HFA/2000 strategy.

26. The distinction between health **indicators** and health **indices** now seems to have reached a level of general agreement. Murnaghan (1981) has proposed a very useful schema to help clarify the 'semantic jungle':

Figure 1



Here health indicators are depicted as statistics selected from a larger pool because they have the power to summarize, to represent a larger body of unaggregated statistics, or to serve as indirect or proxy measures for information which is lacking. Although indicators tend to represent or summarize one class of data only (for instance, mortality or morbidity), a single indicator frequently has multiple uses. In contrast, indices often combine different types of data and represent more complex, multi-dimensional measures, often comprising several individual indicators. The major contributions to the development of these composite indices and the associated problems were mentioned previously (para. 19).

Health status indicators

27. A health status indicator may indicate a state of health, although more usually - as suggested above - it is intended to indicate changes in a state of health and therefore usually requires some quantitative element. Minimally the term is intended to convey information about more or less health (ie. positive or negative) in comparisons across individuals or groups (cross-sections), or of the same or similar individuals or groups through time (longitudinal or time-series) (Culyer, 1983). This introduces the role of health status indicators in

a static and dynamic capacity, and the important distinction between the individual and the aggregate levels. Thus, for example, low birth weight (LBW) is an individual attribute which can be used as an indicator of mortality risk; on the other hand, the percentage of LBW babies in a community is an indicator of the aggregate. Whilst the debate rages on whether the health status of the population is infact more or less than the sum of the health status of individuals (Holland, 1983; Schroeder, 1983), the major focus in both the literature and here is on the aggregate or population interpretation. It is at this latter level that the concept of health status or the level of health takes on a meaning in terms of normative values involving judgements of what is and what is not an acceptable state of health (Bice, 1976). This hinges on the debate surrounding the question 'what is health?'.

'Health'

28. It is hardly necessary to dwell on the definition of 'health' in a report intended for 'health' professionals. However, it is important to introduce those aspects of the debate which are relevant to the development of indicators.

29. The controversy over the definition of health goes back to the very origins of the concern for the 'well-being' of individuals and communities, and at times it seems as if a separate definition of 'health' has evolved with each new 'health' indicator. The great difficulty of conceptualizing 'health' is, however, generally agreed.. Definitions found in the literature reflect both the state of knowledge in the relevant sciences and the various so-called 'models' underlying these sciences (Schroeder, 1983). Thus, for example, the 'medical model' stresses health as the absence of disease and connotes a medical concept of abnormality in pathological function, with an associated set of symptoms and prognoses (Culyer, 1983).

30. Progress beyond this narrow medical model to a broader prevention-oriented sociological concept of health may be credited essentially to WHO. According to the Constitution of the WHO - 'health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity'. Schroeder (1983) claims that this definition had the very pragmatic purpose of proposing an ideal objective that countries with very different cultures, economic backgrounds and health systems could nevertheless use to guide their policy. However, other authors are less convinced of its purpose and feel that it has undoubtedly contributed to the controversy over 'health' ever since it was proposed back in 1946 (Bice, 1976; Nord-Larsen, 1983).

31. As regards the current discussion, the significance of broadening the concept of health in the tradition of the 'social model', lies in the implications this has for making comparisons. If, as Schaefer (1976) claims, definitions of health and illness are 'part and parcel of societies, cultures and epochs', then comparisons between social groups at one moment in time and within social groups across time will be confounded by any changes in the value judgement of the definer - be this those desiring 'health' or those providing it.

32. Finally, the idea that there is a single concept of health which may eventually be developed into a generally acceptable and operationally feasible definition does, at last, seem to be receiving widespread rejection. Hansluwka (1985) suggests there are four reasons for this rejection:

a). the vagueness of the concept;

b). the value judgement of the definer;

c). the multi-dimensionality of the phenomenon;

d). the impossibility of meaningful operationalization.

These issues have been discussed in detail elsewhere (Catford, 1983; Goldsmith, 1972; Jazairi, 1976; Mosse, 1983; Murnaghan, 1981; Schroeder, 1983).

Uses and users of health indicators

33. The essential first step in selecting an indicator is to know its intended uses and users. Table 1 shows the various dimensions which are important in the classification of uses and users.

34. The first dimension - stage of development of a country or area - emphazises an earlier point, namely that it is not realistic to conceive of a common set of indicators which are equally useful in all situations. The relevance and utility of specific indicators has been found to vary along the continuum of the less to the more developed countries, reflecting shifts in health and demographic patterns and the approaches and resources for health care (Siegmann, 1976). Thus for example, it was noted previously (para. 15), that for the developed countries death rates are no longer considered adequate outcome indicators, whilst in the developing countries, where high levels of mortality still prevail, these rates are particularly relevant.

35. The second dimension in the table, organizational level, draws attention to the variation in the focus of concern of users, with consequent implications for the content, scope, specificity and purpose of the indicator. The fundamental distinction between the aggregate and individual levels has already been mentioned (para. 27). This issue is one of the subjects of the edited volume by Holland, Ipsen and Kostrzewski (1979) and considered specifically in the paper by Cerkovnij and colleagues (1979).

36. The third way of classifying uses and users of indicators is in terms of the subject of primary interest - or the dependent variable. Thus, for example, a health planner may have need for an inpatient morbidity rate based on cases or episodes of the disease, whereas the primary interest and need of a public health worker may be for a community-based measure, such as the proportion of households with latrines.

37. Finally, Table 1 reveals the various functional activities carried out in connection with health policies and programmes, for which indicators may be relevant. There is an extensive literature on these activities which hardly needs to be emphasized here. Nord-Larsen (1983), for instance, discusses the needs of different activities for particular

TABLE 1

Important dimensions in the classification of uses and users of health indicators

Stage of development of a country or area

- Less developed
- Transitional
- Developed

Organizational level

- Individual/family
- Community
- District
- National
- World regional/international

Primary interest or dependent variable

- Disease cases or events
- Persons
- Health service organizations and programmes
- Environment

Functional activities

- Assessment/setting objectives and priorities
- Strategic planning
- Implementation/administration
- Monitoring/evaluation

(Adapted from Murnaghan, 1981)

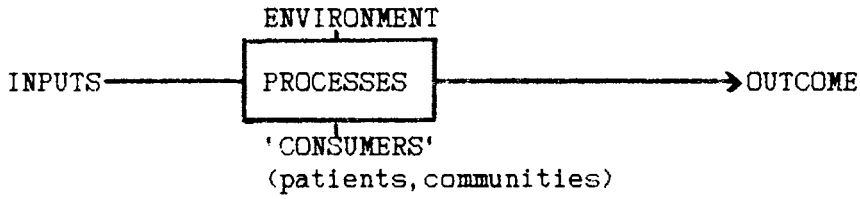
health status indicators. Murnaghan (1981) stresses the importance of feedback mechanisms, such that evaluation leads to reassessment of the situation, redefinition of objectives, redesign of programmes and so on. Clearly, the same indicators are unlikely to be equally necessary and sufficient for all the functions in Table 1. For instance, indicators of outcome, such as the maternal mortality rate, may be more useful at the time of establishing objectives and priorities and when impact is to be evaluated than at the intermediate stages when there is a need for input and operational indicators. This observation introduces some of the important distinctions between the 'types' of indicators as linked to their functional activities.

38. Table 2 gives some examples of the broad headings under which health indicators have been classified. Further examples are given in Hansluwka (1985). There are two issues in particular arising from Tables 1 and 2 which deserve comment.

39. Firstly, the purpose of all indicators is in some way linked to the prioritization, planning, implementation and evaluation of policies and programmes; there seems little point in measuring, for example, health status for its own sake (Uhde, 1983). These policies and programmes may or may not be directly attributed to the health sector. Moreover, some indicators will obviously be useful to several sectors, and this tends to be particularly true of health status indicators. Others, for example indicators of the quality or provision of health care, have greater relevance and utility specifically to the health sector.

40. Secondly, underlying these classifications of indicators and their functions is the conceptualization of health as the outcome of processes arising from the interaction of inputs, consumers (patients, communities) and the environmental context (physical, social, economic and political). This is depicted schematically below:

Figure 2



(Adapted from Culyer, 1983)

This 'cause-effect' model has both general and programme-specific relevance. In the former case, the inputs could be regarded, for instance, as the sum of the activities carried out as a consequence of government policies, with the national population representing the 'consumers' and their overall health status as the outcome. In the latter case, the input could, for example, comprise an ORT educational campaign, with the mothers of children under five representing the 'consumers' and a reduction in the prevalence of cases of severe dehydration in children as the outcome. Clearly, these are both rather simplistic examples. Nevertheless they do demonstrate an important point, namely that it is generally the processes which are the least understood, more especially in the general case, as depicted by the 'black box' in Figure 2. The relevance of specifying the linkages between inputs-processes-outcomes has been stressed by many authors (Martini et al, 1976; Mosley, 1985; Payne, 1985; Vallin and Lopez, 1985)

TABLE 2

Selected examples of broad categories of health indicators

I Source: Culyer, Lavers and Williams (1971).

1. 'State of health' indicators
2. 'Need for health' indicators
3. Effectiveness of health affecting indicators.

II Source: Hansluwka (1985).

1. Measures of health status;
   a) Mortality - survival
   b) Morbidity - disability
   c) Growth and development
   d) Social and economic productivity.

III Source: Jazairi (1976).

1. Health status;
   a) Length of life
   b) Healthfulness of life
2. Quality of health care
3. Social integration of the disabled.

IV Source: Murnaghan (1981).

1. Health status;
   a) Survival/length of life
   b) Healthfulness of life - diseases, disability, growth and development of children, social and economic conditions
2. Health services:
   a) Coverage
   b) Financing
   c) Effectiveness.

V Source: WHO (1981a).

1. Health policy
2. Provision of health care
3. Coverage of PHC
4. Health status indicators.

and some would argue represents one of the major challenges facing health research. Furthermore, a lack of understanding is not only apparent with regard to the processes but also in the actual and desired outcomes (Bice, 1976) and in the selection of measures which reflect these. As pointed out previously (para. 37), indicators of outcome tend to be most useful at the begining and the end of the health planning cycle, and it is their use in the evaluation of impact which is the centre of concern in this report.

Health status indicators and impact evaluation

41. Although the evaluation of health care is a relatively new field, there is a fast growing literature, a selection of which is referenced in the bibliography. This comparatively rapid development has led to a profusion of conflicting terminology and definitions. Holland's (1983) simple exposition provides a starting point for discussion:

> "The evaluation of health care can be defined as the formal determination of the effectiveness, efficiency and acceptability of a planned intervention in achieving stated objectives".

However, this clearly contains further terms which need some clarification:

a). effectiveness is a measure of the technical outcome in medical, psychological or social terms;

b). efficiency is an economic concept which refers to the costs of intervention relative to effectiveness;

c).acceptability refers to whether the intervention is professionally and/or socially satisfactory and adequate.

42. Although some writers may define these terms somewhat differently, it is the underlying concepts which are critical. Thus as regards 'evaluation' the important point is that it is essentially an activity relating results to targets and objectives (Goldacre and Griffin, 1983). The distinction between 'evaluation' and 'monitoring' is becoming increasingly blurred as the former is no longer regarded as an end in itself but rather part of a process which feeds back into the broader policy or programme planning cycle. Similarly, the distinction between 'effectiveness' and 'efficacy' is not always made explicit, even though it does draw attention to the important discrepancy between achievements under the normal working conditions of a programme - 'effectiveness', and achievements theoretically possible under carefully controlled 'ideal' circumstances (Culyer, 1983; Jazairi, 1976).

43. The literature reveals two basic approaches to evaluation, firstly in terms of the various activities - or operations - which constitute the programme, and secondly, in terms of the outcome. Although it is generally agreed that outcome evaluation is more difficult to perform than operational evaluation, it is also recognized that it is often more important (Holland, 1983). There are two levels of outcome evaluation which are usually distinguished (Nord-Larsen, 1983):

a). evaluation of specific health programmes related to specified diagnoses or other health problems;

b). evaluation of health strategies or of diverse programmes made-up of several activities, such as PHC, in relation to non-specific diseases.

Clearly the scope and nature of the objectives which these two levels of evaluation address are somewhat different which, in turn, has a number of implications for the selection of relevant outcome indicators.

44. The distinction has been made explicit by some authors in the use of the terms 'effectiveness' and 'impact'. Recent initiatives by WHO (1985a), for example, link the term 'health effectiveness' with the evaluation of particular interventions affecting disease-specific morbidity, mortality and/or disability, and 'health impact' with the evaluation of national strategies for achieving 'Health for All' which affect the overall health status of the population. More usually the terms impact and effectiveness seem to be used synonymously, yet still acknowledging the two levels at which outcome evaluation may be carried out. Related to this, the term 'outcome' is sometimes broken down into 'impacts' and 'effects', with the latter more directly attributable to a specific programme, whilst the former represent the outcomes of a wide variety of processes, some of which are related to specific programmes. This latter question of multi-causality will be returned to shortly. Further confusion of terms and meanings also arises from the use of the expression 'health programme' to describe both a composite of several activities - including preventive and curative services, and a more disease-specific intervention, such as leprosy control.

45. Indicators of outcome from more or less specific health 'programmes' are usually grouped into what has come to be known as the '5Ds' - death, disease, disability, discomfort and dissatisfaction (Holland, 1983). The earlier discussion has revealed the diversification of outcome measures beyond traditional mortality and morbidity rates and the decreasing relevance of the former to many developed countries. This raises the important issue of the changing utility of particular outcome indicators over time and between countries (Siegmann, 1976).

46. It has been argued that in the context of the developing countries, mortality and morbidity indicators can infact be used to serve two masters - to assess the health status of the general population as an indication of impact of the overall health strategy and to evaluate a specific health intervention (Bergner, et al ,1976). Thus Siegmann (1976), for example, has argued that mortality and morbidity rates are sufficiently sensitive to reveal a change in health status to sanitarian and medical care technology in the short run, as well as to explain it. Siegmann links this with the high prevalence of infectious and acute diseases in the developing countries which are amenable to intervention, and thus health status is a direct outcome of a population having or not having access to prevention and/or treatment.

47. However, the earlier discussion (para. 40) stressed that health outcomes are not only influenced by the 'inputs' of health services but also by 'environmental' conditions and by the characteristics of the 'consumers'. This raises the problem of multi-causality in outcome evaluation, which has been considered in detail by many authors (Holland, 1983; Payne, 1985; Vallin and Lopez, 1985) and has important implications for the selection of indicators. Thus, for example, many factors are known to influence the maternal mortality rate besides the provision of health services, and a change in this rate could be equally attributable to these other factors. Unless some allowance can be made for these additional influences during the collection of information or

during the analysis, this indicator will not be sufficiently specific for the purposes of, say, the evaluation of ante-natal services.

48. The need to be able to control for these alternative influences introduces one of the reasons for the comparative neglect of outcome evaluation, namely the complex methodologies which are often required to disentangle the contributory processes. In the case of evaluating the effectiveness of specific interventions, the situation may be simpler since they tend to focus on one, or a few, well-defined diagnoses, in a well-defined target population, normally of a small size, and therefore the possibility of using a control group as a basis for evaluation is more realistic (Nord-Larsen, 1983). In contrast, assessing the impact of an overall health strategy or composite programme is more problematic. The approach frequently adopted relies on a comparison of indicators constructed from information gathered 'before and after' the strategy or programme was implemented, or by looking at temporal trends. However, all these approaches beg the question of the time-lag before an impact may be detected by the most sensitive indicator. This is often a particular problem at the sub-national level and thus also for the evaluation of a key component of 'Health for All' strategies, namely the reduction of differentials within the population.

49. The selection of sensitive outcome indicators and the appropriate methodologies for evaluation is influenced by the availability of existing data and the mechanisms for its collection. As Murnaghan (1981) has emphasized

> "one rarely goes out and collects indicators per se; rather one derives them from data series capable of providing overall rates and ratios and sub-classifications by age, sex, socio-economic group, geographical area, and so on".

Thus, the designers and users of indicators must come to terms with the practical aspects of information systems. However, although there is clearly an advantage to selecting indicators which may be constructed from existing (historical) data or data which is or can be collected through the existing information system, especially in the developing countries where resources are limited, for the purposes of evaluating impact this may not always be possible or appropriate. This not only relates to the question of the quality, availability, and the degree of detail of the existing information and sources, but also the 'populations' on which they are based. Thus, for example, the morbidity rates derived from routine reporting at a health facility for, say, EPI target diseases, obviously reflect only a proportion of all the cases in the community and therefore are not a good basis for establishing the impact of EPI.

50. The general importance of mutually-supportive sources of information becomes immediately apparent with the evaluation of the impact of health programmes. Here there is a need for data not only for the construction of the outcome measures themselves, but also for their intepretation (Haro, 1979). For instance, utilization statistics are important in establishing the effective catchment population to which health facility data refer. Similarly, information is needed to confirm that the programme being assessed is functioning and being used at the intended level (WHO, 1983a).

51. The existing sources of information which may be used to construct health status indicators generally include the following:

a). censuses and vital registration

b). routine health services reporting

c). epidemiologically surveillance

d). disease registers.

Obviously the availability and reliability of these sources varies considerably between settings. In the context of the developing countries, a major advantage is that they are intended to gather information on a regular basis and for purposes other than just impact evaluation. Thus, in theory, they represent a relatively low-cost and efficient means for constructing health status indicators. Similarly, these sources may be adapted or added-to in order to meet the information requirements of particular measures. However, in practice, as the four country studies will shortly demonstrate, these sources make up a far from adequate information 'system' and the need for extensive revisions is widely felt throughout the developing countries.

52. An alternative source of information for the construction of health status indicators are sample surveys. These provide an opportunity to gather data for the specific purpose or of specific relevance to impact evaluation. Although sample surveys are not usually carried out routinely as part of the government's statistical system and therefore do not provide continuous information, efforts are being made to strengthen country capability in this area, as will be discussed in the next section. One of the major advantages of sample surveys as regards the evaluation of impact is the opportunity provided for the construction of population-based measures (Kelman, 1976). As mentioned above, the problem of selectivity in the data reported from health facilities is often the principal drawback to this source. It must, however, be remembered that health-interview surveys and health facilities provide somewhat different types of morbidity information - the former based on self-assessment by the interviewees and the latter on assessments made and reported by health workers. Equally surveys can provide person-based measures rather than just episode-based. However, efforts to routinely collect information from the community are now being made in many developing counties as an integral part of PHC. Examples of these initiatives will be provided in the four country studies. However prior to this, consideration is given to some of the international and regional activities focusing on health status indicators.

INTERNATIONAL AND REGIONAL ACTIVITIES

53. The purpose of this section is to give a selection of examples of activities at the international and regional levels in connection with health status indicators. Where possible, emphasis will be placed on the selection and use of these indicators to evaluate the impact of PHC programmes.

International activities

54. Three international organizations which have actively contributed to the health indicator movement will be considered here: the United Nations Statistical Office (UNSO), OECD, and WHO. Other agencies involved include the Council for Mutual Economic Assistance, the European Economic Community, the United Nations Research Institute for Social Development, and the Food and Agriculture Organization of the United Nations. Hansluwka (1985) has presented a useful summary table of the indicators of health status advocated by these agencies.

55. The UNSO provided one of the initial stimuli to the health indicator movement, as noted earlier in the report (para. 12). Since the mid-1970s the UNSO has been promoting the use of indicators as tools for the formulation, implementation and evaluation of social policies and programmes. Thus the emphasis has been on 'social indicators' of which health - widely defined - is one component. The contribution of the UNSO has been in terms of supporting the principle of integration, and recent reports explore the problem of making information sources in the socio-economic field mutually supportive (UNSO, 1978; UNSO, 1981). The broad classification of health-related indicators adopted by the UNSO is basically three fold:

1. State of health: a) mortality and length of life
   b) morbidity, impairments and handicaps

2. Availability, use and performance of health agencies

3. Nutrition

Table A in Appendix III gives a more detailed breakdown of the health status indicators together with the key variables by which these may be sub-divided.

56. A further activity sponsored by the UNSO in conjunction with several other agencies which is relevant to the information sources for the construction of indicators , is the United Nations Household Survey Capability Programme (UNHSCP). As the name suggests, the objective of this ambitious ten-year programme is to strengthen abilities for conducting regular national household surveys on a variety of topics, including health, in eighty-five countries (Carlson,1985; UN Secretariat, 1979). The important role of health-interview surveys in providing community-based information was mentioned previously (para. 52).

57. The second international initiative to be considered here is the OECD Social Indicators Development Programme, launched in 1970, with the following objectives:

a) to identify the social demands, aspirations and problems which are, or could become in the decade ahead, major concerns of the socio-economic planning process;

b) to measure and report changes in the relative importance of these concerns;

c) to better focus and enlighten public discussion and government decision-making.

The first major achievement of the Programme was to publish, in 1973, a List of Social Concerns Common to Most OECD Countries (OECD, 1973). The list included 24 'fundamental social concerns' distributed among eight 'primary goal areas', one of which was the 'area of health'. This area covered two 'fundamental social concerns':

a) the probability of a healthy life through all stages of the life cycle;

b) the impact of health impairments on individuals (Jazairi, 1976).

Following this initiative there were several years of complex development work designing indicators to measure these concerns. In 1980, this activity was brought together in a report, published two years later, which discusses the selection criteria for an international list of social indicators, together with specifications, statistical guidelines and disaggregations, and an assessment of data availability at the national level within the OECD countries.

58. In terms of the social concern for health, the OECD recommended indicators are as follows:

1. Length of life:	a) life expectancy b) perinatal mortality rate
2. Healthfulness of life:	a) short-term disability b) long-term disability

59. There are several important issues which need to be emphasized in connection with the OECD Programme:

a) the selected indicators are designed to measure trends in **individual** well-being rather than the health status of the **population** (OECD, 1982);

b) the list should be viewed as a framework which member countries could use to guide implementation appropriate to their needs and circumstances;

c) the selected indicators are output-orientated in the sense of describing final social outcome, rather than inputs or operational aspects;

d) the emphasis is on the 'final impact' on the individual of the complex interaction between government policies and the changing social environment.

e) one of the concerns is to develop an operational definition of disability as a standard, person-based measure of morbidity (Jazairi, 1976). This focuses on disability as a deviation (long or short-term) from an individual's usual level of functioning as measured by ability to perform essential daily tasks.

60. Clearly, the OECD proposed list is aimed at the richer countries with well-established statistical systems. The relevance to the less priviledged nations lies perhaps in the systematic approach adopted to selecting indicators, the integration of information from several sectors, the emphasis placed on the importance of policy-relevance as a selection criteria, and the need for flexibility in developing statistical definitions to suit existing data collection activities.

61. The World Health Organisation has taken a leading role in the development of **health** indicators as opposed to **social** indicators, which are emphasized in the UNSO and OECD programmes described above. Several authors have reviewed the activities of WHO in this area (Deliege, 1983; Hansluwka, 1985; Murnaghan, 1981). WHO's involvement has essentially taken place in the context of the efforts to monitor and evaluate the progress towards the goal of 'Health for All by the Year 2000' (HFA/2000), as mentioned previously (para. 17). Earlier work by WHO on indicators tended to be carried out for the purposes of specific control programmes (Baylet, 1979; WHO, 1971, 1976, 1979a).

62. In 1981, the Thirty-fourth World Health Assembly approved a minimal list of 12 global indicators for monitoring and evaluation of the global strategy of HFA/2000. Table 2 indicated earlier the broad classification of health indicators adopted by WHO. Three of the global indicators fall within the category called health status indicators:

a) nutritional status of children
(birth-weight and weight-for-age)

b) infant mortality

c) life expectancy at birth.

It is important to note the absence here of any indicators of morbidity or of disability. The other nine global indicators include those specifically concerned with the coverage or provision of PHC.

63. An important resource document was published by WHO in 1981(a) in the Health For All Series, which aims to 'help Member States of the WHO to decide which indicators to use, particularly at the national level but also at the regional and global levels for monitoring progress towards HFA/2000'. Thus, in addition to the 12 global indicators, the volume refers to 10 other health status indicators, shown - together with possible data sources - in Table B of Appendix III, as a selective list which countries may use as a 'starting point' for identifying those most relevant to their situation. Hansluwka (1985) provides a useful table of some of the most important considerations in the use of the three global health status indicators.

64. The 1981 publication from WHO discusses the various functions of indicators and the criteria for their selection, but pays particular attention to information requirements, the principal sources of data, and the alternative methods of data collection and appropriate analysis. This represents an important contribution to the field of health indicators, especially relevant to the developing countries. Although

the contents of this publication cannot be discussed in any detail here, three particular points may be emphasized:

a) the recommendation of indicators for use at the global level implies the commitment of **all** countries individually, as well as collectively in regional groupings, to use at least these indicators and to provide the necessary information for the construction of a global indicator. Moreover, in recognition of the problems of international comparisons and aggregations, the global indicators are constructed in terms of numbers of countries which attain 'pre-determined norms' for certain indicators; for example, the number of countries with an infant mortality rate below 50 per 1000 live births;

b) the selection of indicators in a particular country setting should not only be governed by their relevance for policy, but also by the organizational, technical and financial feasibility of collecting and analysing the information required;

c) although the tendency is to emphasize the use of indicators at the national scale, their relevance, utility and feasibility at the local and district levels are also important, especially in connection with the objective of reducing health differentials **within** the country.

65. The first round of monitoring of national, regional and international progress towards HFA/2000 using the 12 global indicators was carried out in 1982-83. The main emphasis in this initial round was on the monitoring of operational aspects, with a particular focus on indicators of the provision of health care and population coverage by PHC. This was justified on the grounds that there had been insufficient time since the implementation of HFA strategies to detect any major impact.

66. In addition to the initiatives taken in conjunction with the HFA/2000 strategy, the WHO Divisions with responsibility for specific health programmes have been concerned to develop appropriate indicators. Some of these programmes have reached a point in their implementation when they need to demonstrate effectiveness at the sub-national and national levels. Operational indicators are still regarded as necessary but no longer sufficient. Thus, for example, the Maternal and Child Health (MCH) Programme has been concerned to develop suitable outcome indicators which not only contribute to evaluating the effectiveness of the programme but also to the overall monitoring of progress towards HFA/2000 (WHO, 1983b). The MCH Programme is focusing on two priority areas - maternal and perinatal mortality and is collaborating with UNICEF, UNFPA, universities and bilateral agencies in the search for appropriate impact indicators. Similarly, the Nutrition Programme has been promoting anthropometric indices as measures of nutritional status for evaluating health impact. A resources document was published in 1983 on measuring change in nutritional status, providing guidelines for assessing the nutritional impact of supplementary feeding programmes for vulnerable groups (WHO, 1983c). The Expanded Programme on Immunization (EPI) and the Programme on Control of Diarrhoeal Diseases (CDD) have also been actively developing methodologies and measures for evaluation purposes (Lemeshow and Robinson, 1985; WHO, 1985b). Finally, the Leprosy Control Programme has developed the OMSLEP Recording and Reporting System which provides details on the important indicators for monitoring and evaluation (Sundaresan, 1984).

67. Whilst there is obviously considerable overlap in the interests of these individual programmes in terms of evaluation and indicators, there has until recently been comparatively little co-ordination. However, within the last year or so, a more concerted and integrated focus on this topic has been promoted under the Health Situation and Trend Assessment Programme (HSATAP) (WHO, 1985a). This activity has been directed towards the needs of countries which have expressed a commitment to assess the impact of programmes carried out as an integral part of PHC, and in which suitable information is being gathered but not utilized. In addition, the emphasis is on countries which have infant mortality rates in excess of the 'norm' set for the WHO global indicator (50 per 1000 live births). The scope of activities was narrowed further by concentrating on a selected group of programmes which address similar target populations, are aimed at severe health problems, have clearly defined strategies, and a strong evaluation element (WHO, 1985a). Attention has therefore been directed towards components of national health strategies particularly aimed at the prevention and control of childhood diseases, including acute diarrhoea, acute repiratory infections, malaria, malnutrition, and diseases amenable to immunization.

68. The Informal Working Group convened by HSATAP in mid-1985 which proposed the above focused approach, developed a limited set of health indicators (Table C in Appendix III), selected on the basis of how well they reflect the chosen problem areas and on the likelihood that they might show changes associated with specific programmes and the implementation of national health strategies. Recognising the need to measure impact at local, district and national levels, appropriate methods were developed for fulfiling the information requirements of these indicators. A plan of action was proposed for a trial of the proposed indicators and methods to be carried out in a small selection of countries (WHO, 1985a). The ultimate objective is to produce general guidelines for distribution to the WHO Regions where they may be adapted and applied by more countries.

Regional activities

69. The previous discussion mentioned the emphasis placed by WHO on the need for the selection and use of indicators to be tailored to the specific requirements and priorities of individual countries. At the regional level, efforts are being made to co-ordinate these activities.

70. Within the WHO Regions, the countries have met to develop their own strategies for achieving HFA/2000 and to select indicators which are appropriate for assessing progress through out the Region. These regional indicators tend to be more detailed than the global indicators, but on the other hand, leave more freedom for interpretation - whilst sacrificing comparability. Like the global indicators, they represent measures of performance and are presented as the number of countries within the Region attaining a specific level of health development (WHO, 1983b).

71. Each performance indicator necessarily implies a commitment to construct the indicator at the national level. Table D (Appendix III) presents the regional indicators related to health status for the Americas, Eastern Mediterranean, European, and Western Pacific Regions. In addition to these health status indicators, certain Regions have issued directives on other measures essential to the monitoring and evaluation process. Musgrove (1984), for example, discusses the eight

socio-economic indicators considered mandatory in the Pan-American Health Organization's Plan of Action.

72. In the South-East Asia Region, there do not appear to be any agreed regional indicators additional to the recommended global measures (Ministry of Health and Population Control - Bangladesh, 1985). Similarly, at a recent meeting of the Member States of the Africa Regional Office (WHO/AFRO, 1985) the focus was on the national level, with the selection of indicators for three priority areas: MCH, EPI, CDD; it remains to be seen whether these will also be accepted to construct indicators for the Africa Region.

73. This discussion, however, is not meant to give the impression that regional initiatives on health indicators stem solely from the approval of global measures by the World Health Assembly in 1981. Prior to this, WHO had long been collaborating with governments through the Regional Offices in developing health information systems and strengthening statistical services, and the subsequent more focused attention on indicators must be seen as an extension of these earlier activities. Thus, for example, the South-East Asia and Western Pacific Regional Offices sponsored the Sixth Workshop of the South-East Asian Medical Centre in 1979, the topic of which was the development of operational, performance and impact indicators with special reference to community health (Noordin, 1979). Nine countries participated in the Workshop, including five which are members of the Commonwealth: Australia, Fiji, India, Malaysia, and Singapore.

74. The objectives of this Workshop were as follows:

a). to draw the attention of participating countries to the declining relevance of conventional health indicators in the present era;

b). to emphasize the need for collaborative effort among participating countries:
- identifying health and health-related indicators relevant and useful in the present day context;
- in the development of new indicators relevant to planning, management and evaluation of health activities,

c) to develop a basis for the formulation of projects to implement the recommendations of the Workshop.

The proceedings of the Workshop include an overview of the needs and problems related to indicators and provide country reports on the relevance and use of statistical measures in the context of community health programmes. A selection of health status indicators are put forward for the evaluation of a variety of programmes, including MCH, immunization, environmental health and nutrition. Mechanisms are suggested for the collection of the information necessary to construct these indicators at the local, district and national levels, as now to be discussed for the four country studies.

COUNTRY ACTIVITIES - FOUR CASE-STUDIES

75. The purpose of this section of the report is to provide a selection of brief country profiles to illustrate the circumstances and influences on the choice of health status indicators. The main lessons learned from the case-studies are drawn together at the end of the section. Four developing countries which are members of the Commonwealth have been chosen. The selection was governed primarily by the need to cover a range of national settings with regard to:

a). basic demographic characteristics - in particular, population size, growth rate, and mortality experience;

b). geographic circumstances, including size, location and climatic factors;

c). economic profile;

d). the nature and scale of major health problems;

e). data sources within the country for the construction of indicators.

However, it must be added here that although considerable care and attention has been given to producing up-to-date and reliable accounts of the situation in the four countries, the difficulty of obtaining the necessary information without country visits has proven to be a major obstacle. The recommendations to this report include the need and possible ways to improve the distribution and exchange of materials between the Commonwealth countries.

76. The countries which are considered are Bangladesh, Malaysia, Sierra Leone, and the Solomon Islands. Table 3 summarises some of the key demographic and socio-economic characteristics at the national scale. Each case-study includes a brief discussion of the country setting. This is followed by a short description of the principal health concerns and the strategies and programmes which have been adopted in response. Particular attention is paid to the implementation of PHC and the organizational structures involved. These are relevant to the description which is given of the existing information and sources available for the construction of health status indicators in each country, together with some examples of evaluation activities.

TABLE 3

Key demographic and socio-economic characteristics for the four selected countries.

Characteristic	Bangladesh[1]	Malaysia[2]	Sierra Leone[3]	Solomon Is[4]
Population (1000s)	93179('82)*	15204('84)	3700('84)[6]	259('83)
Land area (1000 sq km)	144	330	73	27
Av. density (per/sq km)	647('82)	46('84)	51('84)	10('83)
Density range (per/sq km)	38-1358('81)	11-4229('84)	13-566('74)[7]	3-439('76)
Annual growth rate (%)	2.4('74-'81)	2.7('82)	2.6('75-'80)	3.4('83)
Crude death rate per 1000	11.9('82)	5.1('84)	19.2('75-'80)	11.0('83)
Crude birth rate per 1000	34.8('82)	31.2('84)	45.5('75-'80)	44.6('83)
Infant mort. rate per 1000	122('82)	19.3('82)	208('80)	46('84)
Life expect. (M) at birth. (F)	55.9('82) 56.9	67.7('82) 72.5	44.3 47.5	- -
(Both)	-	-	45.9('75-'80)	54.0('83)
% pop.<15yrs	47.0('81)	38.1('82)	40.0('74)[8]	48.0('76)
% pop. urban	15.2('81)	39.9('80)	20.0('79)[8]	10.0('80)
Adult literacy rate (%)	29.2('81)	72('80)	15('79)	25-30('83)
GNP per capita(US$)	123('83-'84) [5]	1994('84)	320('84)[9]	615('83)

Sources: [1] Unless otherwise stated, WHO/SEARO (1983)
[2] Ministry of Health, Malaysia (1985)
[3] Unless otherwise stated, UNFPA-SL (1984)
[4] Ministry of Health and Medical Sciences, Solomon Is.(1985a)
[5] Ministry of Health and Population Control, Bangladesh(1985)
[6] World Bank (1984)
[7] Okoye (1980)
[8] Ministry of Health, Sierra Leone (1984)
[9] Ministry of Health, Sierra Leone (1985)
* Year to which figures refer.

BANGLADESH

77. The Republic of Bangladesh is the second largest developing country in the Commonwealth, with an estimated population of over 93 million in 1982 (Bangladesh Bureau of Statistics, BBS, 1982). The country is surrounded on three sides by India; in the south-east it shares a short border with Burma, while the Bay of Bengal provides the southern boundary of some 600 kilometres of marshy coastline. For the most part, Bangladesh forms the flat alluvial delta of the great river system comprising the Ganges, Brahmaputra and Meghna rivers. Bangladesh is a hot, humid, monsoonal country with seasonal rainfall augmented by annual flooding, often with disasterous consequences.

78. Since 1947, Bangladesh has suffered under the combined effects of an almost stagnant, traditional subsistence economy and a greatly increasing rate of population growth, estimated at 2.4% per annum between 1974 and 1981 and attributed to continuing high fertility and declining mortality (UNFPA-B, 1978). Since 1971, rural poverty has greatly intensified as Bangladesh has suffered from the loss of the West Pakistan markets, the demands of economic, social and administrative reconstruction after the civil war, floods and droughts, and shifts in the pattern of international trade and prices. Today, the economic structure is dominated by subsistence agriculture and a narrow-based modern sector, with low productivity and income, precarious employment, and a limited capacity for generating domestic resources and foreign exchange. One of the symptoms of the growing pressures on the land is the failure of food production to keep up with population growth. In 1982, the average population density was 647 persons per kilometre square - one of the highest in the world - though this varied widely from 38 in Bandarban to 1358 in Dhaka District (BBS, 1982). The per capita GNP was just US$ 123 in 1983/4 (Ministry of Health and Population Control, MHPC-B, 1985), with almost half of all rural households landless, and over two-thirds of the population illiterate.

Health profile

79. The health, nutritional and socio-economic problems of Bangladesh are of vast dimensions (MHPC, 1985). These interact with each other and are aggrevated by the rapidly growing population. Diseases aetiologically related to environmental sanitation and personal hygiene predominate. Communicable conditions, including malaria, diarrhoeal diseases, tuberculosis, leprosy, intestinal helminthiasis, and diseases preventable by vaccines, together with malnutrition, are the major causes of mortality and morbidity (WHO/SEARO, 1983). Diarrhoea is associated with nearly 80% of infant deaths and 60% of deaths in the 1-5 year age group. Almost two-thirds of rural children under 6 years were reported to be chronically under-nourished in 1975/76 (UNFPA-B, 1978).

80. The health strategy in Bangladesh is based essentially on the PHC approach, with an emphasis on the rural areas where over three-quarters of the population live. Priorities include:

a). ensuring safe deliveries in the rural areas by training traditional birth attendants (TBAs);

b). controlling diarrhoeal diseases;

c). providing immunization against major communicable diseases through EPI, including providing tetanus toxoid to pregnant mothers and women of child-bearing age;

d). promoting community participation in the efforts to improve health status.

81. Central to the provision of PHC services are the village voluntary health workers (VHWs) and TBAs. At the next level in the health services heirarchy, the union level, are health and family welfare centres serving populations of, on average, 20,000 people. Through these static units, domiciliary health and family planning services are also provided. Above this level are the upazila (thana or sub-district) health centres, covering populations of between 150,-300,000 which represent the first referral centre in the PHC network. These provide a wide range of promotive, preventive and curative services, delivered in terms of in-patient, out-patient and domiciliary care. Disease-specific programmes, such as EPI campaigns, ORT education and the prevention of blindness, are now administered from these upazila centres rather than as vertical programmes. Finally, district hospitals and specialized institutes and hospitals complete the health services heirarchy. In addition to these government-provided services there is a private sector offering 'modern' and unani, ayurvedic and homeopathic systems of medicine.

82. In 1985, it was estimated that 'health coverage' extended to approximately 45% of the population (MHPC-B, 1985). The principal obstacles facing the further progress of the national strategy for HFA, as assessed by the Ministry of Health and Population Control, include:

a). financial and manpower constraints. The health sector (excluding the Population Control wing) received 2.5% of the total public expenditure in 1985;

b). lack of proper mechanisms for channelling the essential inter-sectoral collaboration.

c). low levels of literacy, extreme poverty and lack of awareness of health. These contribute to limited community participation which, in turn, is aggrevated by the lack of suitable administrative networks at the community level to assist in the processes of decentralizing decision-making, mobilizing local resources and promoting health education;

d). inefficient application and utilization of available resources owing to inadequate planning and management capabilities and to the absence of essential information;

e). poor integration of services at the upazila level. For instance, MCH services are currently under the direct control of the family planning administrative system rather than run in conjunction with the general health services.

Health information, indicators and evaluation

83. Monitoring and evaluation both of the overall health strategy based on the PHC approach and of disease-specific programmes, is carried out by a wide variety of organizations (MHPC-B, 1985). Within the government sector, three ministries are particularly involved: the Ministry of Health and Population Control, the Ministry of Planning, and the Ministry of Finance. Other ministries may also participate in the evaluation of specific programmes, such as the Ministry of Local Government, Rural Development and Co-operatives in the case of water and sanitation programmes. These various ministries are more or less

concerned with different objectives in terms of evaluation, with the Ministry of Health and Population Control perhaps the most directly concerned to evaluate impact. In addition to these government activities, donor agencies may carry out evaluations of particular programmes to which they are contributing; for example, UNICEF have been involved in the monitoring of the ORT programme (MHPC-B, 1985). Other relevant organizations and institutes which may provide expertise or alternative sources of health information include the Bangladesh Medical Research Council, the National Institute of Preventive and Social Medicine, the Bangladesh Institute of Development Studies, the Bangladesh Bureau of Statistics, and the International Centre for Diarrhoeal Diseases Research (ICDDR-B).

84. Recent national-level initiatives in the evaluation of PHC have tended to be carried out as part of global and regional efforts to monitor progress towards the goal of HFA/2000, which were discussed earlier in the report (para. 65). A country profile was prepared in 1980 which included 77 indicators, some of which were health-related, for example, the infant mortality rate. During 1982, a special task force was appointed to examine the changes in the profile, and in the following year a government committee provided the necessary information to construct the recommended 12 global indicators, three of which refer to health status. In 1985, a report was produced which uses the common framework and format, developed in conjunction with WHO, to evaluate the strategies of HFA/2000 (MHPC-B, 1985). Although this report concentrates on indicators for the evaluation of operational performance, it also presents values for a number of health status indicators, as shown in Table E (Appendix III). As regards assessing the impact of PHC activities, the report concludes by suggesting that:

> "Although no significant impact has been made on the vital statistical parameters, such as infant mortality rates, maternal mortality rates and life expectancy, the change in health strategy.... has greatly improved the delivery of PHC at the periphery. It is envisaged that in a few years' time there will be a significant lowering of these vital health statistics parameters". (MHPC-B, 1985).

85. Although there are a number of different sources of information for constructing these and other health status indicators in Bangladesh, it is generally recognized that many of these are inadequate in terms of quality, quantity and availability. The weakness in the existing health information system is seen as one of the major obstacles both to the improvement and planning of PHC and the evaluation of impact. The newly-established Health Information Unit, under the Ministry of Health and Population Control, is primarily responsible for collecting and summarizing information derived from the health services. The reporting networks are, however, poorly developed and efforts to strengthen these rely heavily on the village-level health workers collecting information within the community. The situation is a reflection of the generally poor state of statistical systems in Bangladesh (UNFPA-B, 1978). Although a major step forward was taken with the amalgamation of statistical services under the Bangladesh Bureau of Statistics in the late 1970s, this does not seem to encompass the information network related to the health services.

86. It was mentioned earlier in the report (para. 51), that the decennial censuses have traditionally provided one of the most important sources of basic demographic information, especially on mortality, but in Bangladesh problems of under enumeration, delays in the availability

of information, and their comparative infrequency (the last one was conducted in 1981), reduce their relevance for the investigation of short-term trends, especially at the sub-national level. Equally, the vital registration system was described as being in a 'confused state of non-operation' during an assessment made by UNFPA (1978). This cannot be relied upon as a continuous source of information on births and deaths, except in the small number of sample registration areas in which reporting is more or less complete, and in MATLAB Thana where a comprehensive demographic surveillance system has been in operation for over 20 years (Chowdhury et al, 1981; D'Souza, 1984). Finally, a source of existing (historical) information is also provided by a number of ad hoc demographic and health-related surveys, such as the Bangladesh Fertility Survey, and by comparatively small-scale (by national standards) intensive and exploratory studies. Khan et al (1985), for instance, carried out a study in 1982/83 of maternal mortality in 240 rural villages, using TBAs to collect the necessary information.

MALAYSIA

87. Malaysia is a federation of 13 states and a Federal Territory, comprising the Malay Peninsula and States of Sabah and Sarawak in north-western Borneo Island. By comparison with Bangladesh, it is a comparatively large country, covering a total land area of about 330 square kilometres. The equatorial climate is characterized by extreme humidity, uniformly high temperatures and abundant rainfall. About four-fifths of Malaysia is covered by forest and swamps, amid a series of mountain ranges (Ministry of Health-Malaysia, MOH-M, 1985).

88. Malaysia has a wide diversity of ethnic groups and cultures, and although the state religion is Islam, many other religions are also practised. The estimated population in 1984 was just over 15 million, with an average population density of 46 persons per kilometre square, with a range of 11 to 4229 between the various administrative divisions. The annual growth rate was placed at 2.7% in 1982, with just over a third of the population under 15 years of age. The per capita GNP in 1984 was US$ 1994, with almost half of the population employed in agriculture, but nearly a quarter of the GNP derived from manufacturing. Other demographic and socio-economic characteristics were presented earlier in Table 3.

Health profile

89. Malaysia is experiencing a phase of rapid development which has led to the diversification of the range of health problems and needs. Thus whilst in certain more rural parts of the country and amongst certain population groups, the acute infectious and communicable diseases are still significant causes of mortality and morbidity, especially in children, in other situations - particularly in the urban areas - chronic diseases, such as heart and cardio-vascular diseases, cancer and other so-called 'diseases of affluence', are the major health concerns.

90. The basic health strategy adopted by the Malaysian Government tries to maintain a balance between these different needs consistent with the goal of HFA/2000. An important component of this strategy is the Rural Health System based on the PHC approach and made up of Rural Health Units. The main health centre forms the top tier in this system, serving populations of about 50,000, and providing the intermediate link between higher level services and the community. Beneath each of these centres are normally four health sub-centres, covering about 13,-15,000 people. Finally, under each of these sub-centres there are four or more midwives' clinics, each of which serves a population of 2,-3,000. The emphasis of the Rural Health System is on the provision of basic medical care, maternal and child health including family planning, the prevention and control of communicable diseases, health education, safe water and sanitation, and avoidance of nutritionally-related problems. The aim is for these activites to be presented as an 'integrated package' at the community level (UNFPA-M, 1979). Central to this integrated approach has been the National Family Planning Programme and the Malaysian Population Project which have played significant roles in strengthening maternal and child health services in the rural areas in conjunction with family planning.

91. The Rural Health System provides the lowest level in the health services heirarchy. At the next level are the district hospitals, which are generally found in the smaller urban centres of the Malaysian Peninsula and provide in-patient and out-patient care, as well as supervizing the activities of the rural health units under their

jurisdiction. Finally, at the top of the referral system are general hospitals and specialized units, generally located in the larger urban centres. It should however be pointed out that this description basically refers to the situation in the Malaysian Peninsula; the level of service provision tends to be lower in Sabat and Sarawak.

92. In addition to static units, mobile health teams provide services to the more remote areas and to those not currently provided with permanent facilities. In 1979-80, only about 7% of the rural population in Peninsular Malaysia were 'underserved', but the figures for Sabat and Sarawak are higher (MOH-M, 1985).

93. In Malaysia, virtually all medical and health services are provided by the Government and under the overall responsibility of the Federal Government's Ministry of Health, although a private sector is emerging. Whilst political, professional and administrative decisions are made at the central level, states are responsible for the delivery of health services. In 1984, 4% of total budgetary expenditure was devoted to the health sector.

Health information, indicators and evaluation

94. Information which may be used to construct indicators of the health status of the population is gathered primarily within the government sector. However, the universities, research institutes and bi-lateral or non-governmental agencies may also collect health information for specific purposes. Within the Ministry of Health, the production of health statistics relating to morbidity and to the provision and utilization of health services - in both rural and urban areas, is essentially the responsibility of the Information and Documentation Unit in the Division of Planning and Development (Noordin, 1979). In addition, the Health Information Unit in the Division of Health Services is entrusted with the task of collecting and disseminating epidemiological data. Indepth and ad hoc studies may also be carried out to supplement these sources, usually in connection with problem areas of specific programmes. This type of activity may be performed by the Operations Research Team which is also found in the Division of Planning and Development, or by units in other divisions of the Ministry of Health.

95. Information relevant to health is also generated by the Department of Statistics in the Prime Minister's office, which undertakes all major nationwide surveys and the national censuses - the most recent one being carried out in 1980. This department maintains eight regional centres for data collection in Peninsular Malaysia and two branches in Sabah and Sarawak. In terms, of the Federal Government, the department helps to support statistical units in several of the ministries, including those in the Ministry of Health. Several units outside the Ministry of Health also provide useful health-related data, often on an ad hoc basis, including for example, the Ministry of Education, of Welfare, of Labour, and the Public Works Department which participates in the Rural Water and Sanitation Programme.

96. The National Family Planning Board (NFPB) plays a key part in the health information network, primarily in conjunction with the Ministry of Health and through the National Family Planning Programme and Malaysian Population Project mentioned earlier (para. 90). The NFPB was set up in 1966 as an interministerial organization having statutory power, and is directly accountable to the Prime Minister (UNFPA-M, 1979). The Board acts as the main co-ordinating agency for family

planning and is responsible, together with the Ministry of Health, for policy and planning as well as for implementing major parts of the programme, now as an integral part of MCH services. In addition, the NFPB is responsible for aggregating and analysing relevant data from all clinics from which family planning services are delivered. The Evaluation Division of the NFPB has, until recently, concentrated on programmatic aspects - using operational indicators - but in the last few years more emphasis has been placed on assessing outcome. Thus, for example, a Knowledge, Attitudes and Practice survey was carried out in 1980-81 to investigate the impact of the National Family Planning Programme on fertility patterns and demographic trends. The overall target, established at the start of the programme in 1966, was to reduce the population growth rate to 2% per annum by 1985. Table 3 showed that in 1984 the rate was 2.4% and this is despite reliable evidence for a considerable decline in fertility.

97. Consistent with the Malaysian Government's support of the HFA/2000 strategy, the Ministry of Health participated in the first round of global monitoring of progress in 1982/3. In addition to providing information necessary for the construction of the 12 global indicators, the Ministry contributed to the indicators recommended by the WHO Western Pacific Region. Table D in Appendix III indicates the additional health status indicators proposed by the Regional Office. The sources of information for the construction of these indicators were primarily vital statistics on births and deaths, and mortality and morbidity statistics from the health services. As well as considering trends in these data, material from the decennial censuses and from ad hoc surveys have contributed to the picture.

98. Vital registration falls under the responsibility of the National Registration Department in the Ministry of Home Affairs (UNFPA-M, 1979). Although both birth and death notification is regarded as virtually complete in Peninsular Malaysia (Noordin, 1979), the basic problem with the mortality statistics is that only about two-thirds of all deaths are medically certified in the rural areas where the majority of events take place; the extent of birth and death registration in Sabah and Sarawak is unknown. Moreover, whilst vital registration data provide useful inputs to inter-censal population estimates at the national scale, for the state and district levels the situation is complicated by internal migration. The problem of developing demographic data bases at the sub-national level - providing essential information for the calculation of rates - as well as for trends in mortality, is a familiar problem to all developing countries.

99. Finally, and before moving on to consider the third country, mention should be given to the contribution made by the Malaysian Government to the South-East Asian Medical Information Centre 1979 Workshop which was discussed earlier in the report (para. 73). The paper on Malaysia presented at the Workshop provides examples of the use of health status indicators in the context of evaluating the effectiveness of MCH services and the Tuberculosis Control Programme (Noordin, 1979).

SIERRA LEONE

100. The Republic of Sierra Leone in West Africa covers an area of about 73,000 square kilometres. There are four distinct topographical regions: a mountainous peninsular jutting into the Atlantic ocean, coastal swamps, coastal plains, and an interior plateau and mountain range. Sierra Leone lies in a sub-tropical climatic belt with two markedly different seasons - a rainy season from May to October and a hot dry season from November to April.

101. The estimated population in mid-1984 was just over 3.7 million, with an annual growth rate between 1975-1980 of about 2.6% (UNFPA-SL, 1984); other demographic characteristics were summarized earlier in Table 3. The population is unevenly distributed, with densities varying from 13 people per kilometre square in Koinadugu District in the north-east of the country to 566 in the Western Area on the mountainous coastal peninsular. Over three-quarters of the population live in the rural areas. The communications infrastructure is very poor and many parts are largely inaccessible at certain times in the year.

102. Once a British Protectorate, Sierra Leone formally became independent in 1961, at which point a parliamentary form of government was adopted. For administrative purposes, the country is divided into three provinces and the Western Area which includes the capital Freetown. The provinces are further divided into 12 districts and these, in turn, are made up of chiefdoms - 147 in total.

103. The economy of Sierra Leone, like that of Bangladesh, is dominated by the agricultural sector, engaging more than three-quarters of the labour force, although the mining industry is the major source of export earnings. Economic growth has been depressed since the early 1970s and particularly from the beginning of this decade. The per capita GNP in 1984 was US$ 320 (Ministry of Health - Sierra Leone, MOH-SL, 1985). Among Sierra Leone's economic problems are: a high dependence on imports; low agricultural productivity; disparities between the Western Area and the rest of the country in levels of urbanization, sectoral distribution of the labour force, levels of per capita income and the supply of economic and social services - including health; inadequate roads and communication links between different parts of the country; the low rate of domestic savings; and the precarious employment situation (UNFPA-SL, 1984).

Health profile

104. The health profile of Sierra Leone is characterized by the high prevalence of infectious and communicable diseases, with malaria, tuberculosis, leprosy, measles, tetanus and diarrhoea-related diseases as the major causes of mortality and morbidity. Malnutrition is a further contributor to the poor health status of children, and although there has always been considerable dispute about the levels of child and infant mortality, there is a general consensus that they are both exceptionally high. The infant mortality rate is predicted to be one of the highest in the world, varying widely between districts from about 294 per 1000 live births in Pujehun District to about 168 in the Western Area, according to the 1971 Census (Okoye, 1980). Maternal mortality, though again difficult to quantify accurately, is also reported to be a significant problem, with around a quarter of all deaths to females in the age group 15-44 years due to complications associated with childbirth (UNFPA-SL, 1984).

105. The health and medical services in Sierra Leone are mainly provided by the Government, but with additional facilities available in some localities from missions, mining companies and charitable organizations (Hill and Graham, 1986). The organizational structure of the government-provided services is headed by hospitals at provincial and district levels, with the main referral centres in Freetown. Within the chiefdoms, there are three principal levels - health centres, dispensaries and treatment centres - the latter representing the lowest tier in terms of static health facilities. In addition, there are mobile teams which provide MCH/EPI services to the more remote parts of the country without permanent units. Overall the health services are unevenly distributed through out the country, with a heavy concentration in the Western Area, and an estimated 80% of the population without reasonable access to any health care (UNFPA-SL, 1984). In the fiscal year 1977/78, the Government allocated 7.7% of total public expenditure to the health sector.

106. The National Health Policy adopted by the Government of Sierra Leone places an emphasis on preventive health services whilst also strengthening the present health care delivery system including PHC. Although PHC projects have been in operation since the end of the 1970s, these have been confined to five districts of the country. One of these projects, in the Bo and Pujehun districts, is supported primarily by the Federal Republic of Germany and here the PHC programme forms one component of a wider integrated rural development project (Republic of Sierra Leone and the Federal Republic of Germany, 1985). In Bombali District a pilot PHC project was launched in 1979 in collaboration with WHO and non-governmental agencies, and other smaller village-based health schemes are in operation in two other districts. From the findings of these pilot projects, and following the progress assessment carried out in 1983 as part of the global monitoring of HFA/2000, the National Health System was reviewed and a National Action Plan was adopted to guide the expansion of PHC in the period 1984-2000. The Plan stresses the need for co-operation with programmes which were formerly vertical, such as EPI, MCH-FP, and CDD, and the use of these as practical 'entry points' for the expansion nationwide (MOH-SL, 1984). The implementation of the Plan is heavily dependent on the continuing support of many bi-lateral and multi-lateral donar agencies (Davies, 1985).

107. In the National Action Plan, it is proposed that there will be three levels in the provision of PHC:

a). the village level - here peripheral health units will serve populations of about 500 people, based on village health workers and TBAs. Use will be made of existing fixed facilities where possible - such as treatment centres and dispensaries;

b). chiefdom level - this middle tier in the provision of PHC will be the first referral point for the village health services, and will cover populations of 10,-20,000 with health centres staffed by a team of health workers and MCH-aides;

c). district level - representing the second referral point, with District Health Teams appointed to take overall responsibilty for PHC within their jurisdiction.

The activities carried out within the three tier system are consistent with the eight principal components of the PHC approach as set out in the Alma Ata Declaration and modified to the needs of Sierra Leone.

108. The major obstacles to the progress of the National Action Plan have been described as follows (MOH-SL, 1985):

a). the inadequacy and maldistribution of health infrastructure and manpower resources;

b). inadequacy of the essential drug supply system;

c). small and depressed national economy;

d). inadequate external financial assistance to support the national HFA/2000 strategy.

Health information, indicators and evaluation

109. The sources of information which may be used to construct health status indicators in Sierra Leone, as in Bangladesh and Malaysia, are many and varied. These sources have recently been reviewed by Hill and Graham (1986).

110. The Ministry of Health is responsible for the maintenance of the two principal sources providing continuous mortality and morbidity information - vital registration and routine health facility reporting. The former source is only regarded as reasonably complete in one part of the country, the Western Area, where an estimated 90% of births and deaths were registered in 1980 (MOH-SL, 1981), although it is unclear how such an estimate was made. Through out the remainder of Sierra Leone, coverage is placed at around just 15%, and this is despite the law passed in 1983 making registration legally compulsory. The aggregation of death statistics to produce age and cause-specific mortality rates is undertaken by the Medical Statistics Unit in the Ministry of Health and published by the Central Statistics Office. The most recent figures available are for the Western Area in 1983. Since the early 1970s, various attempts have been made to improve the vital registration system and a UNFPA-supported project has been in operation for the last five years (UNFPA-SL, 1984).

111. The information gathered at the various levels in the health system is also the responsibility of the Medical Statistics Unit as regards aggregation and analysis. In practice, it is estimated that at least a quarter of all health facilities, including hospitals, health centres and lower units, do not submit the expected monthly returns and those which are received are often long overdue and clearly incomplete. In terms of published statistics, those most readily accessible are again for units in the Western Area, and especially Freetown.

112. Additional sources of information on mortality and morbidity are provided by the decennial censuses and by various ad hoc surveys. The most recent census was carried out in December 1985 and the results are currently being analysed by the Central Statistics Office. Prior to this was the 1974 Census, the results of which were the subject of some controversy in terms of both the amount of under-counting and the figures for infant and child mortality. This delayed the publication of the findings till 1980. Similarly, a number of household sample surveys conducted in Sierra Leone in the last 10-12 years have produced conflicting evidence on mortality levels and differentials. Other ad hoc surveys have been carried out in conjunction with specific health problems, such as the malariometric surveys between 1976 and 1979 (WHO-SL, 1982), and the National Nutrition Survey in 1978 (Sierra Leone and USAID, 1978).

113. The inadequacies of the current health information system and the poor co-ordination with sources outside the Ministry of Health and the government, are well-recognized as a major hindrance to the planning, implementation, monitoring and evaluation of the national health programme. Although the sources of mortality and morbidity data are most developed in the Western Area, the disease pattern which emerges is felt to be unrepresentative of other districts and therefore is little use both for national and regional planning. This stems from the relatively priviledged position of the Western Area socially, economically and in terms of health services. Although there may be some consensus on the overall morbidity patterns and levels of mortality in this area, the situation in the remainder of the country is largely unknown.

114. Considerable efforts have been made to increase co-ordination between the various governmental and non-governmental providers and users of information on the health status of the population, including the setting up of the National Population Commission (UNFPA-SL, 1984). Indeed there have been numerous, and sometimes conflicting, sets of recommendations prepared by potential donor agencies on the means to achieve this.

115. One of the major initiatives being taken to improve the quality and availability of health information in Sierra Leone, is being carried out as part of the National Action Plan for PHC. The collection of data in the community by the village health workers is seen as one of their key functions, with the aim of providing a continuous source of health and health-related information for use at this and higher levels of the system. At the district level, it is intended that the health team will undertake the specific responsibility of monitoring the health status of the district's population as a means of evaluating impact (MOH-SL, 1984).

116. The development of information networks based on village workers and peripheral health units has infact been taking place within the PHC projects established prior to the National Action Plan. In the Bo-Pujehun PHC project, for example, a monthly reporting system was established in 1983, after a baseline health survey had been carried out. These activities are the responsibility of the Evaluation and Monitoring Unit of the project. The procedures for routinely aggregating the monthly returns from peripheral units on morbidity, on contacts with the preventive services, and on births and deaths reported by VHWs and TBAs, are still being developed. The intention is for this information to be fed back into the project to improve operational performance, but also to be used for evaluating impact.

117 Infact most of the project evaluations which have been carried out in Sierra Leone have tended to concentrate on operational aspects, especially in the case of disease-specific interventions. The comparative neglect of impact evaluation, despite the fact that some of these programmes have been carried out for sufficient periods to expect to detect some effects, can be explained partly by the problems still being encoutered with the functioning and utilization of these interventions, as for example in the case of EPI (UNICEF-SL, 1985).

118. In 1985, the Ministry of Health published a report describing the national evaluation strategies for HFA/2000, which stresses the importance of health status indicators and includes values for the WHO global indicators (MOH-SL, 1985). At the central government level, implementation of these strategies primarily involves the Health Planning Unit, Health Statistics Unit and the Office of the PHC Co-

ordinator, all in the Ministry of Health, and supported by the Central Planning Authority of the Ministry of Development and Economic Planning. Additional collaboration is expected from several other ministries and non-governmental agencies. However, in the case of disease-specific programmes, the intention is for them to build-in their own mechanisms for collecting and analysing the necessary data to evaluate effectiveness. This approach has been seen as a contradiction to the PHC objective of integration and, at the operational level, may overburden the community-based workers who form an essential part of the proposed health information system.

THE SOLOMON ISLANDS

119. The Solomon Islands provide the fourth and final case-study. This country comprises an archipelago scattered over about 600,000 square kilometres of the Pacific Ocean to the east of Papua New Guinea, with six main islands, and a total land area of over 27,000 square kilometres. The main islands are mostly mountainous with deep ravines and are covered with tropical rain forest, providing a sharp contrast to the numerous coral reefs and lagoons (Carter, 1981). The climate of the Solomon Islands is equatorial with heavy rainfall and no clearly defined seasons, though between November and April cyclones may occur. In 1985 and 1986, severe storms hit the islands, causing considerable devastation and necessitating changes in certain of the health planning priorities.

120. The Solomon Islands, once a British Protectorate, formally gained independence in 1978. For administrative purposes the islands are divided into eight provinces, each with its own local government and uniform powers and responsibilities, whilst central government operates from the capital Honiara. The economy of the Solomon Islands is becoming increasingly diversified, moving away from the former dependence on the export of copra to generate revenue but still reliant on primary export products including fish, timber and palm oil (World Bank, 1980). Foreign aid continues to provide a major input to public-sector spending. The Government itself is the single biggest wage-employer, though the majority of people are only involved in the cash economy to a small extent, being largely dependent on their own food production. The per capita GNP in 1983 was US$ 615, although large differentials in income levels are known to exist.

121. The estimated total population in 1983 was just over a quarter of a million, with an annual growth rate of 3.4%, representing one of the highest in the world and attributed to continuing high fertilty and a falling death rate (World Bank, 1980). Other demographic characteristics were summarized in Table 3. There are two distinct ethnic groups, the Melanesians and the Polynesians, with the former by far the largest group, occupying the six major islands, whilst the latter tend to live on the small outlying islands and atolls (Ministry of Health and Medical Services-Solomon Islands, MHMS-SI, 1985). More than 95% of the inhabitants are Christian, and the adult literacy rate in 1983 was placed between 25-30%. The population density varies widely with the average of just 7.1 persons per kilometre square according to the 1976 Census, but this disguises the extremely scattered distribution with 80% of the people living in communities of less than 200 (World Bank, 1980). Only a tenth of the population resides in the urban areas, the remainder in the 4000 or so small and often remote villages. These features of the Solomon Islands are familiar to the many island communities of the Commonwealth and raise particular problems for the delivery of preventive and curative health services (Commonwealth Secretariat, 1980).

Health profile

122. The health profile of the Solomon Islands is similar to that described for Bangladesh and for Sierra Leone, being characterized by the high prevalence of acute infectious and communicable diseases. Whilst malaria has always been regarded as one of the major health problems, being the leading cause of morbidity in all age groups in 1983, respiratory diseases are recorded as the major cause of mortality, though this may be a reflection of selectivity within the clearly

incomplete recording of deaths. Acute respiratory infections, especially among young children, has been on the increase since 1978, and the reported incidence doubled between 1980 and 1981 (MHMS-SI, 1982). Tuberculosis and diarrhoeal diseases are also significant problems, whilst outbreaks of measles, rubella, pertussis and denugue fever occur periodically.

123. The national health strategy is an integral part of the National Development Plan, and places particular emphasis on integrated rural development and population control. The rural health system is founded on the PHC approach, aiming to provide preventive and curative services to all people through a network of village health aid posts, aid posts, health clinics, area health centres, and hospitals (MHMS-SI, 1985). These five types of facilities comprise the health heirarchy, with the first three providing the key units in the rural areas. Existing disease-specific programmes, such as malaria control - launched in 1980, EPI, and CDD, are now being incorporated into a single general health service. In addition, there are a number of other areas receiving new emphasis such as water and sanitation, health education, and strengthening the links with the non-governmental agencies providing services in the rural areas. The rural health system, set-up in 1980, is promoting community self-reliance together with a health insurance scheme to help fund services. Government expenditure on health represented 8.8% of its total expenditure in 1981. As regards population policies, the stress is on child-spacing. Family planning activities have been subsumed under the integrated rural health system, forming part of the myriad services grouped under the name of 'family health' (MHMS-SI, 1985).

124. The Ministry of Health and Medical Services has its headquarters in the capital Honiara. It is at this level that major policy and planning decisions are made, based on a number of divisions and committees. The implementation of these at the provincial level, is largely in the hands of the local councils, especially in terms of the rural health system.

Health information, indicators and evaluation

125. The poor demographic data base and the underdeveloped health information system found in the Solomon Islands is characteristic of small scattered island states (Commonwealth Secretariat, 1980). The most recent census for which results are readily available was conducted in 1976, though one is scheduled for late 1986 (Statistics Office-SI, 1982). The vital registration system is undeveloped,although there have been several recommendations on routes to improvement (UNFPA-SI, 1981). Partly in response to the lack of vital statistics, a 'Birth Notification Scheme' was launched in 1966, in which all women, regardless of marital status, were interviewed either at the time of birth by the attending nurse or soon after the baby was born. The information, solicited in the form of a maternity history, could be used to produce estimates of childhood mortality (Macrae, 1979; Brass and Macrae, 1984). However the scheme stopped operating effectively in the mid-1970s. The health services therefore now provide the principal continuous source of mortality statistics in addition to morbidity, with figures produced from specific disease programmes and from the various health facilities. Both the Planning and Administrative Divisions of the Ministry of Health and Medical Services are primarily involved in the presentation of statistics, in conjunction with the Statistics Office in the Ministry of Finance.

126. The need to improve the information system in the Solomon Islands is well-recognized by the Government and several assessments have been made on how best to achieve this (UNFPA-SI, 1981). The general problems of scattered small communities and lack of trained staff are two of the major obstacles. Data collection by village health workers, once again is seen as one possible solution. However, the mechanisms for routinely aggregating and using the information gathered by these workers have not yet been established.

127. As in the three other countries, evaluation activities in the Solomon Islands have obviously been hampered by the poor information system. However, as part of the first round of HFA/2000, the Solomon Islands did produce an evaluation report which included figures for the 12 global indicators, together with information on some of the health status indicators recommended by the WHO Western Pacific Regional Office (see Table D in Appendix III). Other national indicators have not yet been selected (MHMS-SI, 1985)

LESSONS LEARNED

128. What are the main lessons learned from the four illustrative case-studies as regards the selection and use of health status indicators?

129. First, there are clearly certain similarities in the major health problems facing these countries, with the acute infectious and communicable diseases providing the major causes of death and illness. It is under these circumstances that, as noted earlier in the report (para. 46), mortality and morbidity statistics can be used to construct outcome indicators both to assess the health status of the general population as an indication of the impact of the overall health strategy and to evaluate the effectiveness of disease-specific programmes. The developing countries can therefore obviously benefit from sharing their experiences, not so much in terms of selecting the same set of indicators, but more in the approaches and practical procedures for collecting the necessary information.

130. Second, the case-studies highlight the importance of adapting the choice of indicators, the methods for gathering information and the uses of indicators to allow for changing circumstances. Thus, for example in the case of Malaysia, the disease profile of the nation is undergoing a period of diversification with some population groups still affected predominantly by communicable conditions, whilst in other groups chronic diseases are more significant. To a certain extent, this difference is found in many developing countries in terms of their rural and urban populations. These changes in the disease profile may of course be related to 'natural' declines in the virulence of particular pathogens and, as noted previously, this greatly complicates the efforts to assess the impact of health programmes (Breslow, 1985). The need for flexibility in the selection and use of indicators is also important in situations where changes occur owing to natural disasters such as floods and cyclones, as the cases of Bangladesh and the Solomon Islands demonstrate.

131. Third, the four country studies reveal the tremendous internal variations which are known to exist as regards the provision of health care but can only be suggested to exist as regards the levels and patterns of mortality and morbidity. The latter point is especially relevant since in all four cases there were significant proportions of the population for whom there was little or no health information. In these instances, so-called 'national indicators' are often based on information from only a fraction of the total and, perhaps most importantly, from the more priviledged sections of the population - socially, economically and with regard to health services. This provides two important lessons: firstly, it would be useful if published 'national' indicators were accompanied by simple figures to reveal the proportion of the population represented; secondly, the huge internal variations in health status found in many developing countries make the current emphasis on producing 'national' indicators somewhat irrelevant to the evaluation of one of the major goals of these countries - namely to reduce internal differentials, indeed to provide 'health for all'.

132. Fourth, and related to the previous point, the weak information systems found in many developing countries represent a major constraint to the construction of relevant indicators for the evaluation of health impact. Furthermore, the lack of existing data makes it difficult for countries to identify the indicators most appropriate to their requirements. The need to utilize the wide variety of - often unintegrated - sources of information, or to launch specific data

collection exercises, such as sample surveys, emerged from all four studies. The problems may be compounded in situations where certain groups in the population are highly mobile, as in Malaysia and the Solomon Islands for instance, and therefore infrequent sources of information, such as the decennial censuses, soon become obsolete. However, in many countries, high quality and continuous sources of information may be provided outside of the government sector. Thus in Bangladesh, for instance, the demographic surveillance system which has long been in operation in MATLAB Thana, provides invaluable data, especially for studying the processes linking inputs and outputs and the mechanisms for intervention (D'Souza, 1984). However these so-called 'population laboratories' are obviously expensive undertakings and generally cover a comparatively small proportion of the total population, and consequently their relevance at the national level is open to question

133. Fifth, the four-case studies introduce the common set of programmes which are now being integrated into rural health systems according to the PHC approach. The focus of these programmes on common target groups, more specifically mothers and children under five years, stresses the need for co-ordination in the selection and use of indicators for evaluating impact, and on the need for reasonably reliable demographic estimates of the proportion of the total population these target groups represent at the national and sub-national levels. The country studies have also indicated the potential problems with regard to information collection when partly integrated and partly horizontal programmes co-exist, with the consequent duplication of responsibilities and effort.

134. Sixth, a great deal of emphasis is clearly being given to the development of information networks based on community-level health workers. Although this is consistent with the process of decentralizing decision-making and with greater community participation, there is still evidence that the information requirements are being developed from the 'top down' without consideration for the uses and needs of the community for this information. The development of reliable and efficient information systems relies heavily on the perceived need for the data by those responsible for its collection. The information-gathering role of the PHC worker must be appropriate to the overall integrated nature of their responsibilities and activities, rather than expecting them to satisfy the needs of individual programmes (WHO/AFRO, 1985). Moreover, co-ordination is not just required at the local level but also centrally. The four country examples all demonstrated the wide variety of governmental and non-governmental units with some involvement and concern for the collection and use of health and health-related information. The importance of amalgamating some of these functions under a co-ordinating 'authority' has been a recurrent theme in the discussions above. The need for extensive revisions of the statistical system seems to be a current recommendation in many developing countries. However the numerous and often conflicting suggestions on how 'best' this may be achieved according to different outside agencies, seem likely to jeopardize the plans for greater co-ordination.

135. Finally, there are a number of lessons emerging from the country studies as regards impact evaluation. Thus it appears that an equally wide variety of government and non-government agencies are involved in evaluation as there are concerned with information systems, with an equal lack of collaboration. However, given the comparatively short length of time in which PHC activities have been in operation in some areas, it is perhaps not surprising to find the focus on operational rather than outcome evaluation. Although the initiatives taken as part

of the first round of monitoring of progress towards HFA/2000 have led to greater emphasis on information support, the focus on the 12 global indicators does not seem to have been matched by the development of relevant national indicators. Moreover, the presentation of health status indicators in one 'round' is not by itself adequate for identifying impact. Further information and effort is needed to look at trends over time in these indicators or to make valid comparisons between sub-groups of the population. The following section of the report raises some of the key questions involved in meeting these requirements.

SELECTION AND USE OF HEALTH STATUS INDICATORS

136. A recurrent message throughout the report has been the need for health status indicators which are relevant to each country's own situation. Thus, although the case-studies presented in the previous section showed certain similarities in both the disease profile and the approaches to health care, it was also apparent that many other factors influence the selection and use of indicators which are peculiar to each national and sub-national setting. It is the sheer diversity of local, district and national circumstances in which health status indicators may be called into play which makes it unrealistic and inappropriate to provide a list for universal use. Instead, it seems more useful to provide insights into some of the key questions which need to be answered and to demonstrate how these may strengthen the potential users' ability to select the indicators most appropriate to their needs and situation. Whilst the emphasis here is on measures for evaluating the impact of PHC activities, clearly some indicators have multiple uses and may be equally relevant to other stages in the priorities-planning-implementation-evaluation cycle.

137. The style of presentation of these guidelines takes the form of check-lists of questions, sub-divided by key topics, as an aid to quick reference. This approach should also enable the reader to by-pass those sections and questions which are less relevant to their needs and knowledge. It is important to stress that the selection of the optimum indicator or set of indicators for particular circumstances, involves an iterative process since the answer to a question at one stage may feed back to influence previous and subsequent answers. Thus for example, an indicator may appear as optimum as regards its validity and reliability, but subsequently proves impractical for that setting because of its information requirements. Furthermore, although most of the questions are phrased in terms of a single indicator, in many situations it will be necessary to use several indicators and therefore the questions may need to be repeated several times over.

138. To support these necessarily abbreviated check-lists, cross-references are made with the earlier text and key works are cited to provide further guidance or technical details. In addition, an example is given to illustrate the application of some of these questions in a specific country setting. The Commonwealth developing country of The Gambia has been selected for this. However, it should be stressed from the outset that this is a preliminary attempt to provide guiding questions rather than a comprehensive and definitive presentation. An important recommendation, therefore, is that these guidelines are followed-up with practical applications and adaptations in country settings. Equally the case-study presented here is for illustrative purposes only and the findings would need to be supported with additional work in the field before the final selection of indicators could be made and the procedures set-up for collection and use.

Check-lists of guiding questions

139. Who are the intended users and what are the intended uses for the indicators?

Users:

a). at what level in the health delivery system is the user located and/or concerned with? eg. village health worker; ministry of health's chief planning officer; regional medical officer of health; programme field officer; [paras. 36,37,134]

b). what is their degree of expertise and training? eg. medically-qualified; literate; numerate; familiarity with handling data;

c). what financial, technical and manpower resources are available to them? eg. funding to support data-gathering activities; equipment available such as calculators, computer facilities, transport; statistical assistants;

d). who are the other users with whom collaboration is important? eg. Central Statistics Unit; donor agencies; international and regional organizations; officials working in other government sectors - such as public works or agriculture; [paras. 70,83,95,118,]

Uses:

a). at what level are the indicators primarily intended to be used to measure impact? eg. global, regional, national,local; [paras. 35,63]

b). what is the specific purposes for which the indicators are required? Are multiple uses desired? eg. evaluation of the effectiveness of a disease-specific programme; evaluation of the impact of PHC activities; [paras. 37,39,50,66]

c). what is the intended flow of the indicator values? eg. feedback to lower levels; relevance at central level for prioritization, planning and management; [paras.111,134]

d). how do these uses fit in with other potential uses? [paras. 33,37]

e). what are the requirements for indicators at a Regional and Global level for monitoring progess towards HFA/2000? [paras. 63,71]

References: Baylet, 1979; Murnaghan, 1978,1981; Nord-Larsen, 1983; Uhde, 1983

140. Is the necessary background information available for the evaluation of impact?

a). what is the overall or local context in which the programme(s) operates - with regard to health; demographic characteristics; physical, social and economic circumstances? eg. developing country, predominence of acute infections and communicable diseases. [paras. 34,79,89,104,122]

b). what are the stated objectives of the health strategies or individual programmes which are being evaluated with regard to impact? eg. reduce the infant and child mortality rate; reduce the prevalence of communicable diseases; [paras. 41,80]

c). what are the targets which have been set at the level at which the indicators are required? eg. nationally to reduce infant mortality to 50 per 1000 live births; to reduce the proportion of low birth weight (LBW) babies delivered by TBAs in the district to 10% or less; to ensure there are no new cases of diptheria in the child population under five served by a health centre; [paras. 42,96]

d). what are the desired outcomes and to what extent are the processes linking inputs to outcomes in terms of health status understood? [paras. 40,47]

e). is there evidence that the programme(s) is functioning and being utilized at the intended level? What is the coverage achieved? Has an evaluation been carried out of the programme's performance? [paras. 50,117]

References: Holland, 1983; Martini et al, 1976; Payne,1985; WHO, 1981a, 1985a;

141. Which of the alternative health status indicators may be appropriate for the specified users and uses?

a). which indicators have been found useful by other countries/programmes/districts? [paras. 66,73,74]

b). which indicators have been suggested by international and regional organizations? eg. WHO, OECD, UNSO [paras. 55,58,61,62].

c). which (if any) health status indicators are currently being used and in what capacity?

References: Hansluwka, 1985; Holland et al, 1979; Murnaghan, 1981; Noordin, 1979; WHO, 1981a, 1985a;

142. Which of the possible indicators has the desirable or 'ideal' qualities for assessing the impact of the programme(s) in question?

a). is the indicator valid? ie. does it measure what it is supposed to measure?

b). is the indicator reliable? ie. are the procedures used to derive the indicator accurate - do they consistently give the same result when applied to the same phenomenon? Reliability requires the elimination or control of extraneous factors influencing the measurement, and since one of the primary purposes of an indicator is comparison over time, the question of reliability concerns intervening factors under current circumstances and those causing distortions over time.

c). is the indicator sensitive? ie. is it responsive to changes in the phenomenon being measured? [paras. 46,48,49]

d). is the indicator specific ie. does it reflect **only** the phenomenon it is intended to? eg. the infant mortality rate clearly reflects more than the delivery of health services. [para. 47]

e). is the indicator a direct or proxy measure? eg. use of contraceptive prevalence as a proxy indicator for assessing levels of fertility rather than using fertility rates.

f). is the indicator relevant and compatible with wider socio-economic concerns and indicators? [para. 57]

References: Goldsmith, 1972; Holland, 1983; Palloni. 1985; Rosser, 1983; WHO,1981a, 1983b;

143. What are the basic sub-categories and disaggregations by which the indicator should be available?

a). what are the demographic and socio-economic variables needed for meaningful intepretation of the indicator? eg. proportion of LBW babies by age and parity of the mother; cause-specific mortality rates by age and sex. [paras. 49,55,57]

References: Jazairi, 1976; Murnaghan, 1981; OECD, 1982; UNSO, 1978, 1981; WHO, 1982.

144. What is the state of readiness of the indicator?

a). have the precise information requirements of the indicator been defined? eg. proportion of LBW babies- need: total number of infants born in a community over a defined period and, of these, the number whose weight at birth was less than 2500g.

b). have operational definitions, codes, reference standards, etc. been developed for the indicator?

145. What are the study designs and procedures most appropriate to the assessment of impact using specific health status indicators?

a). what types of study designs are available? eg. quasi-experimental, cross-sectional, cohort, case-control, historic. [para. 48]

b). what types of comparisons are made using these designs? eg. over time for the same population against a specified target; between different sub-groups at one moment in time. [para. 27]

c). do these designs require the indicator information to be collected continuously, periodically or on one occasion, and prospectively or retrospectively?

d). what methods of data collection can be employed? eg. record reviews, sentinel surveillance, sample surveys, health facility sampling. [paras. 49,51,52]

References: Holland, 1983; Nord-Larsen, 1983; WHO, 1983a, 1985b.

146. Given the answers to the above questions, which health status indicators are most appropriate in the current context - technically, operationally, and financially?

a). is the necessary information for the construction of the indicator(s), and for its disaggregation, already being gathered as part of the existing health information system or by the data-collection activities of other sectors? [para. 49]

b). is the information of adequate quality, quantity and frequency for the intended uses of the indicator?

c). if the necessary data are not already being gathered, is it feasible to do so within the existing information system? [paras. 51,52]

d). have practical and affordable methods of gathering the necessary information to construct the indicator been demonstrated in other similar situations? Can these methods be applied in the present situation and will they remain equally practical and affordable? [para. 49]

e). is the disaggregated information for the construction of the indicator at that level also useful at higher levels?

f). can the indicator be constructed in such a way as to reveal any differences between groups within the same population?

g). is a single indicator adequate and if not, what is the optimum set of indicators - technicaly, operationally, and financially?

h). which indicators could be constructed from the same sources of information and/or using the same data-collection methods?

References: Murnaghan, 1981; OECD, 1982; Sundaresan, 1984; WHO, 1981a.

147. If 'new' information is required, what procedures will be used to obtain it?

a). what methods of data collection are preferable - technically, operationally, and financially? eg. sample survey, observational study, sentinel surveillance.

b). who would be responsible for gathering and/or supervising the collection and how would this fit in with their existing roles? eg community health nurses; village elders; health centre records clerks. [paras. 116,134]

c). do those who would be given this responsibility have the necessary skills, time and commitment to the collection of the information, ? If not, how could this be rectified?

References: UNSO, 1981; WHO, 1981a, 1983b.

148. What are the procedures involved in the construction of the indicator(s) and the demonstration of impact?

a). which study designs have been selected? [paras. 48,147]

b). have the necessary protocols and field manuals been prepared, describing the study design, methods of data collection, and guidelines for data aggregation?

c). what analytical techniques will be used in the presentation of the indicator values?

d). what mechanisms have been set-up to monitor the quality of information and the reliability and usefulness of the indicator(s)?

e). has a system been established for the feedback of the indicator values to higher and lower levels?

f). how will the indicator values be displayed? eg. diagrammatically; in tabular form.?

References: Holland et al, 1979; OECD, 1982; Rosser, 1983; Sundaresan, 1984; WHO, 1981a.

Illustrative case-study

149. The objective of this section of the report is to illustrate the application of some of the guiding questions for the selection and use of health status indicators to a particular country. The case of The Gambia will be used here. The first part of the discussion introduces the setting, including the health profile and strategies. This is followed by the demonstration of the use of the guiding questions. Obviously it is not possible to discuss all the questions nor all the possible indicators which may be relevant and feasible in The Gambia, and therefore the discussion concentrates on just two possible indicators which could be used to meet the needs assumed in this example. Of course, in practice, the selection of health status indicators is not just based on each ones' individual relevance and feasibility, but also on their combined usefulness, as a noted previously (para. 137). Similarly it should be reiterated that the case presented is for illustrative purposes only and is not in any way meant as a recommendation of specific indicators or procedures. The findings here would clearly need to be supported with additional work in the field before the final selection could be made.

The Gambia

150. The Republic of The Gambia, located on the west coast of Africa, covers a narrow area of just 11,000 square kilometres, through which the Gambia River flows. Away from the marshland adjacent to the river, the terrain is savannah - a reflection of the semi-arid climate, with an annual average of just 90-115 centimetres of rain falling generally between June and October.

151. The Gambia became formally independent in 1965, when it adopted a parliamentary system of government. For administrative purposes the country is divided into five divisions, made up of 46 rural districts and 2 urban councils. The districts, in turn, comprise villages - an estimated 1000 in total in 1981 (Medical and Health Department - The Gambia, MHD-G, 1981).

152. The estimated population of The Gambia in 1984 was 725,000, with an average density of 47 persons per kilometre square, although the figure ranges from 13 to 58 between the various rural districts. There is evidence for an increasing rate of townward migration, with about 13% of the total population resident in the urban areas in 1975 (MHD-G, 1981). The projected annual growth rate in 1983 was 2.6-2.7%, with a characteristic young age structure - almost half of the population are less than 15 years of age (World Bank, 1984). An estimated 15-20% of the adult population are illiterate. Whilst the people of The Gambia comprise many different ethnic groups, the Mandinka are the most numerous. The majority of the population are Muslim.

153. The economy of The Gambia is dependent on agricultural production in order to provide both internal revenue and foreign exchange. Recurrent droughts and the high rate of population increase have adversely affected cash-crop production and food production and consumption. The per capita GNP in 1982 was US$ 360 (World Bank, 1984), whilst the percentage of government expenditure on the health sector was just over 8% (Ministry of Health, Labour and Social Welfare, MHLSW-G, 1985).

Health profile

154. The major health concerns in The Gambia are similar to those described previously for the four other countries, with acute infectious and communicable diseases representing the major causes of mortality and morbidity. Malaria, tuberculosis, respiratory infections, tetanus, and diarrhoeal diseases are all still significant problems - especially for the younger age groups, whilst most of the vaccine-preventable diseases, such as measles, polio and pertussis, have become of lesser importance within the last few years, as will be discussed shortly.

155. The government health services of The Gambia are organized in a pyramidal system, with two general hospitals at the apex, functioning as major referral centres, but also providing out-patient clinics (Hill and Graham, 1986). Below this level, and apart from certain specialist units, there is a network of health centres, dispensaries, sub-dispensaries and health posts. The health centre is the main institution in the rural areas, providing MCH/EPI services, curative outpatient care and environmental education, and staffed by qualified medical personnel, mostly nurses. Dispensaries primarily provide basic care, with periodic MCH/EPI services delivered by visiting mobile teams, and are run by a nurse/dispenser. At the next level is the sub-dispensary, which usually has a resident community health nurse (CHNs), and which, in her absence, are lock-up units. At the base of the pyramid of fixed health facilities are health posts manned by village health workers (VHWs) and TBAs. In addition to these government-provided services, there are a number of non-governmental facilities offering inpatient and/or outpatient care (MHD-G, 1981).

156. In The Gambia, PHC is seen as both a philosophy and a strategy for health development. This is outlined in the PHC Action Plan 1980/81-1985/86 (MHLSW-G, 1985) which stresses the following components of its implementation:

a). the phased establishment of Village Health Services, initial action being concentrated in the least served areas;

b). the strengthening and re-organization of the National Health Services in order to support the extension of the health care system to the village communities;

c). promotion of community participation and self-reliant effort in health activity at the community level;

d). mobilization of extra resources for health through inter-sectoral co-operation and co-ordination at village and other levels.

The emphasis is placed on the integration of curative and preventive services, including vertical programmes which were already in operation prior to the adoption of the PHC Action Plan, such as EPI.

157. The implementation of PHC in The Gambia has occurred in phases, with national coverage scheduled for 1986. Village Health Services are being established in villages with over 400 inhabitants, based on trained community health workers (CHWs), comprising one village health worker (VHW) and two TBAs for each PHC village and providing simple curative, promotive and preventive care (MHLSW-G, 1985). This lowest level in the health services heirarchy is supported by referral centres at the higher levels, with the CHWs supervized by CHNs generally based at key PHC villages. Each CHN supports a cluster of 4 to 8 PHC villages,

promoting community activities as well as providing technical assistance to the CHWs, and they thus represent the first and main link between the community and the formal health sector (MHLSW-G, 1985). These CHNs are, in turn, supported by nearby health centres, although a recent review of PHC in The Gambia noted that this support was often lacking and represented a weak point in the chain of formal sector back-up for PHC (MHLSW-G, 1985).

158. The major support for CHNs and CHWs seems infact to come from the Regional Health Teams (RHTs), which provide an intermediate connection between peripheral and central health services. There are currently three RHTs - Central, Eastern and Western, each one having to collaborate with two separate Divisional administrations. The RHTs are responsible for supervizing all basic health services, below hospital level, within their jurisdiction, although it appears that they are tending to concentrate on the furtherance of PHC in terms of Village Health Services.

159. At the central level, management and supervision of the health sector is carried out within a complex organizational structure. As regards PHC, the most relevant sections include the Health Planning Unit and Committee, and under the Director of Medical Services, the various committees, working groups - such as the PHC Working Party, and central specialized units. The latter, including MCH/EPI, Epidemiology and Statistics, Community Health, Health Education, and Nutrition, plan and monitor specialized programme components within the integrated service structure and in collaboration with RHTs.

160. Although the health information system has undergone revision almost yearly since 1980, the recent PHC Review noted the need for further development, in particular with regard to the feedback of information to the peripheral units from the central level, and the use of the information in service management and evaluation (MHLSW-G, 1985). Weaknesses and problems seem to exist at all levels in the reporting network, including the level of the CHWs and CHNs who collect information and pass it on directly without utilizing it in their day-to-day activities and without receiving any feedback from higher services, and at the level of the RHTs where a wealth of available data is under-utilized.

161. Having briefly introduced the setting provided by The Gambia, the discussion can now move on to the selection of health status indicators. As mentioned previously, in order to confine the scope of this section, attention will be focused on two possible indicators for the evaluation of the impact of PHC activities and of a specific programme - MCH/EPI. Furthermore, the focus here is on the level of the RHT since this clearly represents a critical link between central and peripheral health services in The Gambia and it is at this level that the need for guidance in the selection of indicators has been so keenly expressed.

Check-lists of guiding questions

162. Who are the intended users and what are the intended uses of the indicators?

a). Users: as just mentioned, the RHTs will be assumed to be the primary users of interest. The three RHTs in The Gambia each comprise 5 or less members, some of whom are professionally qualified, all are literate and most have at least some ability to handle data. The financial and personnel resources available

to each RHT for the purposes of the collection and use of health information are limited. There is no designated individual with responsibility solely for health information, restricted access to data-processing facilities, and limited transport for field data collection. The principal other users with whom the RHTs collaborate include the central specialized units of the Ministry of Health, Labour and Social Welfare, such as the newly established Health Statistics and Epidemiology Unit; multi-lateral and bi-lateral agencies supporting PHC, such as UNICEF and WHO; other ministries active in areas inter-related with PHC, such as the Central Statistics Office and the Ministry of Economic Planning and Industrial Development; and local externally-funded research activities, such as those of the Medical Research Council (MRC) of Great Britain.

b). Uses: it will be assumed here that there are two principal purposes for which the indicators are required - firstly, to evaluate the impact of all PHC activities on the health status of the population falling within each RHTs area, and secondly to evaluate the impact of the MCH/EPI services. These two examples will raise many issues which are of general relevance. In view of the limited resources for gathering and analysing information found in most developing countries, including The Gambia, the preference is for indicators which have multiple uses, although this is often at the sacrifice of specificity (see para. 142). Besides being relevant and useful at the RHT level, the selected indicators should also be useful to planning, management and evaluation at the national level, and to provide useful feedback to health centres, CHNs and CHWs.

163. Is the necessary background information available?

a). Objectives and targets - in The Gambia, PHC is seen as an integral part of the national development strategy - "the aim being to extend health service coverage to the entire Gambian population and to attack the main disease problems of communities" (MHLSW-G, 1985). The priority diseases for prevention and control are set-out in the PHC Action Plan 1980/81-1985/86. These include malaria, diarrhoeal diseases, EPI target diseases, complications and conditions associated with pregnancy and childbirth, and acute lower respiratory tract infections. Other concerns for which programmes are being developed for incorporation in PHC are child spacing, nutritional surveillance and intervention, primary oral and ophthalmic care, sexually transmitted diseases, schistosomiasis, leprosy and tuberculosis. In addition to the overall aim to reduce infant and child mortality rates, there are more specific objectives related to particular programmes. For example EPI aims to make immunization services available to all children under five years of age and to pregnant women by the year 1990, whilst the CDD programme aims to reduce 'to a minimum' the morbidity and mortality rates due to diarrhoea amongst children under five. Clearly many of the preventive and curative services are aimed at similar target groups, in particular mothers and children under five. More specific programme targets have been set at the RHT level and below, although many of these focus on delivery and coverage rather than impact and effects.

b). Inputs and outcomes - it was noted earlier in the report (para. 40), that specifiying the linkages between inputs-processes-

outcomes still provide a major challenge to health research. Thus, for example, although it is generally agreed that the mechanisms leading to a reduction in infant and child mortality also include those which lie outside the immediate influence of the health sector, for other more specific conditions, such as deaths due to neonatal tetanus, the processes may be directly amenable to intervention. In the case of The Gambia, both the MCH programme and EPI are relevant, since the provision of ante- and post-natal care **and** the delivery of tetanus toxoid to pregnant women have the potential to reduce deaths due to neonatal tetanus.

c). Operational performance of the programme(s) - as was also true of the four other countries, the evaluation of PHC in The Gambia has tended to concentrate on operational aspects. This does, however, provide essential background information for the assessment of impact since, as noted earlier, outcome evaluation assumes that the programme(s) is functioning and being utilized as intended. The Gambian Government carried out a comprehensive review of PHC in 1984/85. This included questionnaire surveys both of personnel involved in the delivery of PHC in the rural areas and of a sample of 580 households in PHC and non-PHC villages. Whilst noting the PHC programmes' considerable achievements, high coverage and effective technology, the Review also highlights some of the problem areas. As regards MCH/EPI, several other sources in addition to the PHC Review give insights into performance. Thus, over 90% of mothers are estimated to have their babies delivered by trained TBAs, almost three-quarters of all mothers are examined at least three times by a TBA, and almost 100% of women attended by TBAs at birth are seen post-natally during the first week. This high degree of contact of mothers with the providers of health care, is confirmed by a study in 1982 which found that 90% of mothers possessed an infant welfare card and attended clinic regularly (MHLSW-G, 1985). In addition, immunization services have a long history in The Gambia, being traced back to the smallpox and measles vaccination campaigns in the late sixties and early seventies. EPI was launched nationally in 1979 before the PHC Action Plan was adopted, but is now more or less fully integrated with MCH services. High rates of immunization coverage are recorded from several sources (for example, Hull, Williams and Oldfield, 1983), some using the standard EPI cluster sampling design (Lemeshow and Robinson, 1985). Although national coverage in terms of BCG is placed at 98% and for DPT3, Polio 3 and measles all above 80%, the proportion of children fully immunized in 1984 was just over half (but over two-thirds in 1982). As regards pregnant women receiving three doses of tetanus toxoid, figures upwards of three-quarters have been recorded (MHD-G, 1981). In addition to the above, a number of other indications of the coverage and quality of PHC activities are available, including those from the USAID-funded project on Mass Media for Infant Health (1981-1984) and from the MRC's longitudinal monitoring and evaluation study involving 14 PHC villages in the Central RHT's area.

164. Which of the possible health status indicators may be appropriate for the purposes described?

a). Possible indicators for assessing the impact of PHC activities - the earlier discussions and the examples presented in Appendix III, suggest that there are basically three groups of indicators, namely those relating to mortality, to morbidity, and to disability, and that these, in turn, may reflect positive or negative health. It may be recalled that mortality indicators, for instance, may refer to survival (positive health) - such as the life expectancy at birth, or death (negative health) - such as the infant mortality rate. These two indicators are commonly used to measure and compare social and economic as well as health conditions among population groups, and are discussed at length in the literature (Hansluwka, 1985; Murnaghan, 1981; Jazairi, 1976). As regards morbidity and disability indicators, many of these serve the dual purpose of evaluating the impact of the overall health services as well as that of specific programmes. Possible indicators include: infant mortality rate; life expectancy at birth; maternal mortality rate; birth rate; proportion of live-born infants with birth weight of less than 2500g; age specific death rates for three principal causes of death; incidence and/or prevalence rates for the six most prevalent diseases; and the rate of long term disability in the adult population. In terms of current usage by RHTs in The Gambia, there do not appear to be any health status indicators which are routinely constructed for evaluation or for other purposes.

b). Possible indicators for assessing the effectiveness of MCH/EPI services -there are many outcome indicators which could be suggested here reflecting the 5 D's - death, disease, disability, discomfort and dissatisfaction, mentioned earlier (para. 45). Possible indicators include: infant mortality rate; proportion of children dying before age 2 or 5 years; proportion of deaths of under 5 years due to diarrhoeal diseases; proportion of children under 5 years with at least one diarrhoeal episode in the last two weeks; proportion of live-born infants dying from neonatal tetanus; proportion of children under 5 years who have had measles and the number of these who have died; and the proportion of children aged 5-9 who are fully or partially paralyzed (WHO, 1983b).

165. Do these indicators have desirable technical qualities?

As mentioned previously, it is not possible to consider the relative merits of all the possible indicators here and, therefore, the following discussion will concentrate on just two for the purposes of illustration: the infant mortality rate and the proportion of live-born infants dying of neonatal tetanus. It is important to note that both of these are essentially population-based measures and this has a number of implications for the methods and sources for their construction, as will become apparent in the following pages. Clearly either indicator could be used to evaluate the combined impact of all PHC activities **and** to evaluate the effectiveness of the MCH/EPI programme, but we shall concentrate on the use of the infant mortality rate for the former purpose and the death rate for neonatal tetanus for the latter.

a). infant mortality rate(IMR): as mentioned above, the qualities and drawbacks to this indicator have been discussed at length in

the literature. It is one of the most widely used measures in the developing countries but is increasingly being replaced by the perinatal mortality rate in the developed countries. In terms of the technical qualities of the IMR, it is the question of reliability which is usually regarded as important in the context of the developing countries. Although there is a long tradition and wealth of experience to draw-on and the basic analytical techniques are well developed, the tremendous difficulties of collecting reliable and reasonably complete information to construct this indicator cannot be neglected and have been the subjects of much concern and research effort throughout the developing countries. The application of the same data-collection procedures applied more or less to the same population have been found to yield surprisingly different IMRs in many country settings. Moreover, the problems of controlling for the multitude of factors outside of the health sector which are known to influence the level of infant mortality are considerable, both in terms of cross-sectional and longitudinal assessments. The IMR as an indicator of the impact of PHC activities is not, therefore, a very specific measure. However, as are most mortality-based measures, this indicator is relatively sensitive to changes over time in these influencing factors, and has been found to be particularly useful in differentiating between sub-groups of the population. In the short term, the IMR is affected by fluctuations in the birth rate which may distort the values for individual years, particularly at the sub-national level where the problems of incomplete information have a proportionally greater distorting effect. Moreover, although the operational definition of the IMR seems reasonably straight forward, there is a continuing debate on the composition of the numerator and denominator linked to the definition of live-birth, stillbirth, foetal death etc. and how this may affect the level and comparability of rates (Hansluwka, 1985). The mismatching of the numerator and denominator with regard to the period and to the base population is especially serious at the lower levels of aggregation. Finally, one of the major advantages to this indicator is undoubtedly its compatibility with wider socio-economic concerns and, indeed, it is frequently used to reflect these.

b). neonatal tetanus death rate - as with the IMR, the question of reliability is usually more critical for this indicator than validity. One of the major problems relates to the accuracy of the diagnosis of cases of neonatal tetanus and of the age of the infant ie. less than 28 days. In particular, differences are bound to emerge between lay diagnoses by, for example, parents, and diagnoses by qualified medical personnel. Moreover, even amongst the latter group inconsistent results often emerge. The sensitivity of this indicator has been found to be reasonably high, responding fairly rapidly to changes in the quality and coverage of the relevant health programmes. However, in the short-term and at the local level, it is also affected by fluctuations in the birth rate, and by distortions arising from the small number of cases. As regards specificity, it was noted earlier that just as there are many indicators which could be chosen to assess the impact of the MCH/EPI programme, so the death rate due to neonatal tetanus reflects more than just these services. In particular, the availability and uptake of the necessary curative care is relevant since this may prevent an infant with neonatal tetanus from dying, although it must be

said that there is usually a high case-fatality rate for this disease. The major controlling factors are, however, felt to be maternal immunization with tetanus toxoid, hygienic practises at the time of delivery, and post-natal care. In The Gambia, these activities all fall under the MCH/EPI programme, although health education and overall improvements in the living conditions into which infants are delivered are also relevant.

166. What are the basic sub-categories and disaggregations by which the indicator should be available?

a). infant mortality rate - at the sub-national level, the degree to which the IMR may be considered by various sub-categories is governed partly by the problems of insufficient births and deaths to produce stable rates. The use of this indicator in the identification of 'high risk' groups at the sub-national level is therefore often dependent on crude disaggregations by, for instance, maternal factors such as parity, age or education, or of particular importance here, residence in PHC or non-PHC villages or in rural or urban areas.

b). neonatal tetanus death rate - the above reservations also apply to this indicator. In addition to the residential and maternal factors just mentioned, other relevant disaggregations include, for example, place of delivery, attendance at delivery of birth, mother's immunization history, number of ante- and post-natal clinic or home visits received by the mother, and access to curative care facilities.

167. What is the state of readiness of these indicators?

a). infant mortality rate - this is usually defined as:

$$\text{IMR} = \frac{\text{Deaths under age one during year}}{\text{Live-births during year}} \times 100$$

Calculated in this way, however, the IMR is not a 'true' rate since the denominator is not necessarily the same population at risk of death as that represented in the numerator. Some of the deaths under one year of age may infact be births which occurred in the previous year whilst, equally, some of the births occurring during the year may die in the next year. If the date of birth is recorded at the time of death registration, then the year of birth of those dying is available and therefore a 'true' IMR can be calculated. The extent to which these two calculations produce different IMRs is influenced by the magnitude of the fluctuations in the number of births. As noted earlier, the problem of including strictly live births in the calculations may lead to some errors. The procedures involved in the collection of the necessary data, in the analysis and in the corrections for errors, are well-documented (see, for example, Kpedekpo, 1982; Palmore, 1971; UN, 1983, 1984; Vallin, Pollard and Heligman, 1984). Briefly, there are two basic approaches to estimating the IMR - direct and indirect - the choice of which is partly influenced by the data already available. These methods have different data requirements and involve different collection and analytical procedures. In countries where the vital registration system has a reasonable coverage (ie. around 90% of all vital events are reported), the IMR may be computed dirctly from registered live-births and deaths under one year of

age. Alternatively, it may be calculated directly from births and deaths reported in maternity histories gathered during household sample surveys. The indirect approach has arisen both as a response to the lack and inaccuracy of vital statistics found in most developing countries, and as a means of avoiding some of the omissions and errors associated with the direct approach.

b). neonatal tetanus death rate - usually calculated as:

$$\frac{\text{Number of deaths due to neonatal tetanus during year}}{\text{Number of live-births during year}} \times 100$$

168. What study designs and procedures are most appropriate to the assessment of impact using these indicators?

a). impact of PHC activities - the use of the IMR to evaluate impact could be employed in the context of cross-sectional, cohort or historic study designs. These designs are discussed in a number of standard texts (for instance, Casley and Lury, 1981; Fleiss, 1981; Kleinbaum et al, 1981; MacMahon and Pugh, 1970;).The basis of comparison could either be for the same population over time observing trends in the IMR, or between population groups, for one or more moments in time, with differential 'exposure' to PHC activities. The latter type of design was employed during the recent Gambian Government review of PHC (MHLSW-G, 1985), using sample survey methods to collect the necessary information and comparing PHC and non-PHC villages. The question of controlling at the point of data collection or analysis for extraneous influences ie. those not directly related to PHC activities which may obscure the comparison (such as comparing villages which are fundamentally different with regard to, say, socio-economic status of their populations), is particularly important though frequently neglected. Assessment of impact by comparison over time encounters similar difficulties with regard to allowing quantitatively for other influences, such as natural changes in the virulence of particular pathogens or perhaps the introduction of a local industry or agricultural scheme which leads to the overall improvement in the standard of living and, in turn, to a fall in the IMR.

b). effectiveness of MCH/EPI - the indicator chosen for discussion here, the death rate for neonatal tetanus, can also be constructed for comparisons over time or between groups. It is often particularly difficult to collect the necessary information retrospectively within the community using, say, household surveys, owing to both under-recording of these early deaths and misdiagnoses of neonatal tetanus as the cause, unless of course there is complete death registration and medical certification. Health facility reporting generally provides a continuous source of data on the numerator but not the denominator for the calculation of a rate. An alternative to using cross-sectional or historic designs is the cohort or longitudinal approach, involving the collection of information prospectively. The technical and financial draw-backs to this design have tended to be regarded as prohibitive. However, the prospects for follow-up studies have been enhanced by the development of PHC reporting systems where, for example, in The Gambia, CHWs have direct contact with the households in their

village and where TBAs carry out postnatal visits and are thus following infants as part of their routine responsibilities.

169. Are these indicators appropriate technically, operationally and financially in the context of The Gambia?

a). infant mortality rate - In The Gambia, there are several sources of information - of varying quality and completeness - which provide a basis for calculating past or present IMRs; these have been reviewed recently by Hill and Graham (1986). The registration of births and deaths is the responsibility of the Ministry of Health, Labour and Social Welfare and is centrally controlled from the Registry in the capital Banjul. In the rural areas, births and deaths are supposed to be notified to the nearest fixed health facility, but this system is known to be seriously deficient. More recently, the establishment of Village Health Services has diversified the reporting networks. Recording of certain events, including births and deaths, is one of the responsibilities of VHWs and TBAs. These CHWs, in turn, report to their supervisory CHN, whilst health centres and dispensaries are also required to make monthly returns. This information is then forwarded to the RHT and subsequently passed-on to the Health Statistics and Epidemiology Unit in Banjul and to the Central Registry in the case of births and deaths. Whilst this PHC-based reporting system has the capability of greatly improving birth and infant death registration, and thus the IMR, there do not appear to be any in-built or independent mechanisms for checking the quality and completeness of reporting. Nevertheless, this undoubtedly represents one of the key sources of continuous data on early age mortality, particularly at the regional and local levels. Other sources providing historic information include the decennial censuses, the last one being carried out in 1983 and for which the results are still awaited, household surveys, and the longitudinal studies carried out by the British MRC (Hill and Graham, 1986). Whilst there are a wide variety of published estimates of the IMR, some purporting to be nationally representative (for example, 217 per 1000 live births from the 1973 Census) and others referring to localized areas (for instance, 175 from the study in Keneba village for the period 1971-75 - Billewicz and McGregor, 1981), there do not appear to be any figures produced regularly for the areas covered by the RHTs.

b). neonatal tetanus death rate - as just mentioned, in the absence of reliable and complete death registration and certification data, which is the case in The Gambia, the principal source of information on cases of neonatal tetanus and fatalities are fixed health facilities. The difficulty here is the lack of information on the number of births within the facilities' catchment. Although CHWs are required to routinely record births, infant deaths and cases of tetanus within the community, the latter does not necessarily lead to death and does not necessarily involve neonates, and therefore this source requires some modification before it can be used to calculate the death rate due to neonatal tetanus, as will be returned to shortly. Historic information on the neonatal tetanus death rate is available from a number of small-scale community-based surveys and from the continuous surveillance carried out by the British MRC.

170. If 'new' information is required, what procedures will be used to obtain it?

a). infant mortality rate - a further problem with using the existing sources of information described above, such as vital registration or census data, is that they are unable to provide all the necessary details for the useful disaggregation of the indicator or to enable the control of the extraneous factors influencing infant mortality. These are some of the reasons why specific data-collection activities may be required, such as sample surveys. A further advantage of the latter is that information for more than one indicator may be gathered at the same time, thus improving cost-effectiveness. The possibility of sample surveys being carried routinely as part of the national information system is receiving support under the United Nations Household Survey Capability Programme, as mentioned earlier in the report (paras. 52,56), whilst the current USAID-Westinghouse programme on Demographic and Health Surveys in developing countries is a further important initiative. In the context of The Gambia, the use of periodic health-interview surveys, both to supplement the alternative sources and as a means of establishing the quality and selectivity of information from the health services, is worth serious consideration. Moreover, given the high degree of contact between TBAs and mothers at the time of birth in The Gambia, there is scope here for the application of a technique for producing regular estimates of the probability of dying by age 2 and 5 (and so deriving estimates of the IMR), based on simple questions about the survival of the women's previous child or children asked at the time of the current birth. This technique was applied in the Solomon Islands as described earlier (para. 125), and a field trial has recently been carried out in Mali (Hill and Macrae, 1985).

b). neonatal tetanus death rate - although sample surveys could provide a means of collecting data specifically for the construction of this indicator, in view of the large sample of households which would be required and the problems mentioned previously (para. 168), the possibility of CHWs systematically following birth cohorts does provide an attractive alternative - both in terms of data collection and the identification of high risk groups. This would require the development and application of a suitable diagnostic algorithm to aid the CHWs' reporting abilities for neonatal tetanus (see, for example, Essex, 1981).

171. What are the procedures involved in the construction of these indicators and the demonstration of impact?

a). infant mortality rate - the precise steps involved in calculating this, using the direct or indirect approach, have been adequately explained elsewhere, as noted above. Although some of the calculations are reasonably straight forward, the analysis of differentials and the control of extraneous factors is likely to require technical support to the RHT, at least initially, possibly from the Health Statistics and Epidemiology Unit. The importance of feeding the resultant regional indicator values back to health centres and to CHNs and CHWs must be stressed since these are the levels at which the basic information is gathered and at which there is potential for immediate action. The presentation could be in the form of simple graphs showing the overall trend in the RHT area,

removing random fluctuations by smoothing procedures, or where the numbers permit, in the form of maps indicating where the IMR is reportedly higher than the figure for the whole region. Seasonal trends in the IMR could also be calculated at the regional level when series over several years are available. At the higher central levels, more detailed breakdowns may be more useful, together with the unaggregated statistics for the calculation of national IMRs.

b). neonatal tetanus death rate - the procedures involved were mentioned earlier (paras. 167,168). As with the IMR, it seems likely that some degree of technical support to the RHTs will be needed. Although it is obviously equally important to ensure feedback of the values for this indicator as for the IMR, the presentation could perhaps place greater emphasis on differentials which may help to identify areas of reduced impact. Finally, the indicator value could also be graphed simultaneously with information on the performance of the MCH/EPI programme, such as proportion of pregant women receiving tetanus toxoid, or proportion of births delivered by trained personnel.

CONCLUSIONS

172. This study reflects two inter-related issues which are currently of concern to ministries of health in many developing countries: namely, the evaluation of the impact of their strategies and programmes on the health status of the population and the inadequacies of the existing information and methods with which to achieve this. The actual and potential contribution of indicators to progress in these two areas has been the major theme of this report.

173. A 'state of the art' review traced the origins of the so-called 'health indicator movement' and its continuing links with the parallel concern for 'social indicators'. The recent literature reveals a divergence in the objectives, interests and approaches involved in the selection and use of health indicators between developed and developing countries. In the context of the former, attention has tended to focus on conceptual issues surrounding the phenomenon called 'health', on the growing irrelevance of mortality-based measures for evaluation of impact and the search for alternatives, and on the scientifically desirable qualities of indicators. In contrast, the concern of the developing countries has been more practically-oriented, raising questions about policy relevance and the feasibility of particular indicators given limited financial, technical and manpower resources. This difference of emphasis is perhaps not surprising given the contrasts in the statistical systems and health services between developed and developing countries which are obviously relevant to the selection and use of health indicators. This is not to imply that the two groups cannot benefit from sharing their experiences in this field, but it does challenge the recent emphasis on constructing 'global' indicators, and draws attention to the all too familiar gap between more theoretical concerns and practical applications.

174. The report has attempted to describe some of the international and regional initiatives in the field of health indicators, looking in particular at the contributions made by UNSO, OECD, and WHO. Four illustrative country studies were presented as examples of activities in the context of different health profiles and information systems. The final section of the report should be regarded as exploratory, comprising preliminary checklists of relevant questions to guide the selection and use of health status indicators. The application of these questions was demonstrated for the case of the Commonwealth developing country - The Gambia.

175. The contents of the report lead to a number of conclusions which will now be summarized.

176. First, it is difficult to envisage the development of a universally applicable and relevant set of health status indicators, using common operational definitions and procedures. This is as much to do with the differences in the constraints on the collection of adequate and reliable information to construct the indicators between countries, as to do with the differences in their needs, health situations and statistical systems. Thus, for example, although the infant mortality rate is a key indicator for many countries, the wide inter-country variations in the levels of accuracy, availability and representativeness of the information on which it is based, have led some authors to question whether infact the same phenomenon is being

measured. Moreover, a global recommendation to adopt the infant mortality rate as an indicator has very different implications in terms of feasibility in different country settings. The report therefore reiterates the need for countries to identify their own requirements for particular health status indicators, both at the national and sub-national levels, and to regularly reassess these requirements and the extent to which they are being met. The selection of health status indicators is not a once-and-for-all procedure; there is a need to review their continuing relevance and feasibility.

177. Second, the fact that countries are not necessarily using exactly the same health status indicators does not obviate the need and value of sharing their experiences. In particular, there is much to be gained by the regular exchange of problems encountered and solutions sought, especially at the sub-national level.

178. Third, the broadening of the interpretation of 'health', which so clearly finds expression in the PHC approach now being adopted throughout the Commonwealth, necessarily implies greater inter-sectoral collaboration. This applies as much to the needs and uses of health information as it does to other aspects of the national development strategy. The country studies presented here bear witness to the multiple demands and uses for this information which require a greater degree of co-ordination and pooling of the limited resources than is currently found.

179. Fourth, this report has highlighted the situation commonly faced in the developing countries of the Commonwealth, namely the lack of basic information to guide the selection of relevant health status indicators. The case-studies have revealed that for some parts of these countries there is virtually no reliable, recent data and, in these circumstances, the value of establishing a network of sentinel reporting areas throughout the country is clear. Moreover, the emphasis on national-level indicators stimulated by some of the international organizations has tended to divert attention away from the importance of identifying and monitoring internal differentials, the reduction of which forms an essential part of 'health for all' strategies. Many of the so-called 'national' indicators are infact constructed using information for only a proportion of the total population and often for one of the most priviledged proportions - socially, economically and with regard to health services. This is not altogether surprising and is a situation unlikely to change in the near future despite the considerable progress many developing countries have made in strengthening their statistical systems. However, the value of these 'national' indicators to actual and potential users, is likely to be improved if some estimate is given of the proportion of the population represented in these key statistics. Alternatively, this sort of qualifying figure could also be employed as an aid to interpretation where sub-national figures are available by presenting, for example, national indicator values together with the range at the district level. These types of refinement represent one of the areas requiring further research within the field of health status indicators.

180. Fifth, the setting-up of PHC reporting networks has brought about an important change in the health information systems of many developing countries, namely the potential for providing a continuous source of community-based data. This is particularly relevant to the evaluation of impact. A major drawback to the use of information from fixed health facilities has always been the question of selectivity. In other words, the events recorded at these facilities represent an often unknown

proportion of all such events occurring in the community. This has obvious implications for assessing the impact of programmes on the health status of the general population and not just those in contact with these health services. Many factors help to explain selectivity, including differential access, availability and uptake of both curative and preventive health care. PHC aims to improve this situation by providing village-level services and, whilst the reporting of village health workers may still be selective, there is the potential to collect information which more closely reflects the health status of the community. For this potential to be realized, greater efforts are needed to control the quality of the information gathered and to assess the possible selection biases in the reporting. It hardly needs to be stressed that the data-gathering role assigned to these community-level health workers should be consistent with the integrated nature of their activities and that the feedback of results from higher levels in the information system needs to be improved.

181. Sixth, the selection and use of health status indicators clearly cannot be considered in isolation from the existing health information system. One does not necessarily have to go out and 'collect' indicators per se since they can often be constructed from the pool of statistics currently being gathered for other intentions, such as patient management, resource allocation, or vital registration. The report has noted, however, that for the purposes of impact assessment there may be a need for specific information-gathering activities, such as baseline surveys. This need may arise not only because of the lack of sufficient detail being collected by the exisiting system, but also because of inadequacies in the coverage and the quality of the data. On the other hand, in many countries the collection of health information appears to be running ahead of the ability to use it. Under-utilized information often exists at all levels in the system. The co-existance of efforts to collect more information together with neglected sources is characteristic of many developing countries, partly as a consequence of the frequent (and sometimes conflicting) revisions and the lack of integration in their statistical systems. The emphasis must be shifted away from the **quantity** to the **quality** of information. This is consistent with the keenly felt need for a minimal set of selective and mutually-supportive indicators rather than comprehensiveness.

182. Finally, although there may appear to be a multitude of possible health status indicators from which countries have to choose, often causing some bewilderment and confusion, in practice the choice can be simplified by posing certain key questions. This report has attempted to provide preliminary checklists of questions; these lists, however, need to be assessed and adapted using field trials in different country settings and at different levels. In the context of the developing countries, the feasibility of collecting the necessary information - even at the minimum acceptable level of accuracy - for constructing the indicator will often provide one of the most basic guiding principles. Establishing what is infact feasible is part and parcel of the wider need for countries themselves to have a greater awareness of the operation, coverage, reliability and the problems of their statistical systems. Thus although many developing countries have been 'evaluated' in terms of their current system and needs, these assessments have tended to be carried out by outside experts, but, more importantly, they do not seem to have improved the country's **own** understanding of the situation. In particular, the requirements for information at the different levels do not seem to have been expressed by the users themselves. Understanding and attempting to satisfy some if not all of these requirements is critical to the collection of relevant

information, especially at the village level. Of course, it is unrealistic to expect, say, village health workers to identify their needs without some form of training and guidance, but the importance of establishing the information system from the 'bottom up' rather than 'top down' is entirely consistent with the underlying rationale of PHC.

RECOMMENDATIONS

183. On the basis of this report the following recommendations for action are made.

National

184. Recognition should be given to the need to strengthen the information system as an essential and integral part of the overall health strategy and not as a separate activity; this requires a financial commitment from governments to support at least a minimal information system from domestic revenues.

185. The importance of assessing impact in addition to evaluating the operational aspects of health programmes must be appreciated at all levels; countries will need to decide for themselves whether this requires specific training efforts given the current levels of expertise.

186. Greater intersectoral collaboration is essential to avoid unnecessary duplication of data collection activities, to facilitate the pooling of limited technical, financial and manpower resources, and to improve the quality and scope of health and health-related information.

187. The particular health status indicators which countries finally select as relevant and feasible, given their needs and circumstances, should be subject to regular assessment as a means of controlling quality and coverage and of ensuring appropriate refinements.

188. Consideration should be given to carrying-out field trials of the procedures for constructing and using a minimal set of mutually-supportive health status indicators, at different levels in the health service, **before** these procedures are adopted on a wider scale.

189. The value of routine information from health facilities for the construction of morbidity indicators should be assessed to establish the nature and the degree to which it is representative of the situation in the general community.

190. Assessments should also be made of the quality and the coverage of information arising from village-based reporting networks, especially in terms of births and deaths, with a view to its integration with the existing vital registration system.

191. Greater efforts are needed to improve the feedback of health and health-related information between the central and peripheral levels, and to improve the use of this information in the planning-management-evaluation cycle.

Regional

192. In order to improve and share experience in the selection and use of health status indicators between Commonwealth countries, regional workshops should be held in collaboration with other agencies which are active in this field at the international and regional levels.

193. Consideration should be given to short-term exchanges of health personnel, who are involved in information systems and in the evaluation of the impact of health programmes, between Commonwealth countries for the purposes of training and sharing experience.

Commonwealth Secretariat

194. The Commonwealth Secretariat should promote collaboration between countries in the selection and use of health status indicators for evaluation by :

a). sponsoring regional workshops and providing the appropriate technical assistance;

b). providing scholarships or other financial assistance to facilitate further training of nationals and exchange schemes;

c). providing a central repository for government reports and other relevant publications in the area of health status indicators, and disseminating the key materials to Commonwealth countries.

195. The Commonwealth Secretariat should maintain strong links with other international agencies concerned with indicators and evaluation, and in particular with the current initiatives being taken as part of WHO's Health Situation and Trend Assessment Programme.

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APPENDIX I

LIST OF LIBRARY SOURCES

Birkbeck College,
Malet Street,
London, WC1E 7HX.

British Library of Political and Economic Science,
Portugal Street,
London, WC2.

British Red Cross,
9, Grosvenor Crescent,
London, SW1X 7EJ.

Commonwealth Institute,
Kensington High Street,
London, W8.

Commonwealth Secretariat,
10, Carlton House Terrace,
and
58, Quadrant House,
Pall Mall,
London, SW1.

Institute of Child Health,
30, Guildford Road,
London, WC2.

Institute of Commonwealth Studies,
Queen Elizabeth House,
St. Giles,
Oxford.

International Planned Parenthood Federation (IPPF),
Regent's College,
Inner Circle,
Regent's Park,
London, NW1 4NS.

London School of Economics and Political Science,
Haughten Street,
London, WC2.

London School of Hygiene and Tropical Medicine,
Keppel Street, (Gower Street),
London, WC1E 7HT.

Rhodes House,
University of Oxford,
South Parks Road,
Oxford.

School of Oriental & African Studies,
Malet Street,
London, WC1.

University College of London,
Gower Street,
London, WC1E 6BT.

University of London,
Senate House,
Malet Street,
London, WC1E 7HU.

World Health Organization - Headquarters,
Geneva,
Switzerland.

APPENDIX II

London School of Hygiene and Tropical Medicine
(University of London)

Working Group on Health Impact Assessment

Assessment of the impact of health programmes and interventions in the developing countries has become a subject of growing interest and importance over the past few years. the need for simple and low-cost methods has been expressed by national governments and by the international agencies, and is seen as a priority in monitoring progress towards the goal of Health for All by the Year 2000. Advances in the area of impact assessment are dependent on the integration of expertise from many different disciplines within the social as well as the medical sciences. The London School of Hygiene and Tropical Medicine is able to offer a high level and probably unique range of such expertise. Although the different Departments within the School have long been involved in projects relevant to health impact assessment, a new initiative has been launched recently to systematically bring this experience together.

The Working Group on Health Impact Assessment was set up in the London School of Hygiene and Tropical Medicine in September 1985. The aims of the Group are to provide a focus, both within the School and in collaboration with outside agencies, for research, training and advice on methods for measuring the impact of health interventions.

The emphasis is on the development of simple techniques which can be added to existing health information systems and on appropriate study designs. The Working Group provides a forum for the exchange of ideas through regular meetings, seminars, publications, and a research register, and is holding a workshop in January 1987 on measurement and assessment in health and nutrition interventions. Formation of the Working Group means that the School as a whole is able to respond to requests from governments and international agencies for specific pieces of work. Examples of recent and forthcoming projects involving members of the Working Group include:

- health interview surveys in Turkey, mali, Algeria and Ethiopia;
- assessment of the health and nutrition impact of the urban health care services in Indonesia;
- case control methods in diarrhoea control evaluation;
- evaluation of home oral rehydration programme in Bangladesh;
- field trial of a new method for estimating child mortality in Mali;
- case control study of the efficacy of measles vaccination in Brazil;
- review of sources of data on mortality and morbidity in the four West African countries of Mali, Senegal, Sierra Leone and The Gambia.

The membership of the Working Group is flexible and designed to reflect the wide variety of interests and skills in this area within the School and to respond to the needs of specific projects and proposals. A core group of individuals, shown below, form a Steering Committee for the work of the wider Group:

Professor David Bradley,
Department of Tropical Hygiene.

Professor William Brass,
Department of Medical Demography.

Dr Richard Feacham,
Department of Tropical Hygiene.

Dr Wendy Graham, (co-ordinator),
Department of Medical Demography.

Dr Allan Hill,
Department of Medical Demography.

Mr Philip Payne,
Department of Human Nutrition.

Dr Peter Smith,
Tropical Epidemiology Unit.

Dr Andrew Tomkins,
Department of Human Nutrition.

Dr Patrick Vaughan,
Evaluation and Planning Centre.

APPENDIX III

TABLE A

Health status indicators, and useful classifying variables, proposed by United Nations Statistical Office.

Indicator	Classifying variables
1. Mortality and length of life.	
a) Number or rates of death (annually; some classifications less frequently).	Sex, age, urban, rural, national or ethnic origin, causes of death, socio-economic group.
b) Expectation of life, selected ages, (annually or less frequently).	Sex, age, urban, rural, national or ethnic origin; socio-economic group.
2. Morbidity, impairments and handicaps.	
a) Spells of bed disability and restricted activity for specified periods (annually or less frequently).	Sex, age, urban, rural, national or ethnic origin, diseases and injuries, (broad and/or selected groups), socio-economic group.
b) Duration of spells of bed disability and restricted activity for specified period (annually or less frequently).	Sex, age, urban, rural, diseases and injuries, (broad and/or selected groups), socio-economic group.
c) Number and proportion of persons with selected chronic functional disabilities for specified period (annually or less frequently).	Sex, age, urban, rural, national or ethnic origin, impairments and handicaps, socio-economic group.
d) Number and/or incidence of selected communicable diseases of public health importance, (annually).	Sex, age, urban, rural, geographical area, selected diseases.

(Source: UNSO, 1978).

TABLE B

Health status indicators, by principal sources of data, proposed by the World Health Organization.

Indicators	Possible Sources of Data					
	Vital events register	Population and household censuses	Routine health service records	Epidemiological surveillance data	Sample surveys	Disease registers
*Birth weight	P	-	-	-	A	-
*Weight & height	-	-	P	A	A	-
Arm circumference	-	-	P	A	A	-
*Infant mortality	P	P	-	A	-	-
Child mortality	P	P	-	-	A	-
Under-5 mortality	P	P	-	-	A	-
Under-5 proportionate mortality	P	-	-	-	A	-
Life expectancy at given age	P	P	-	-	A	-
Maternal mortality	P	P	P	-	-	A
Crude birth rate	P	P	-	-	A	-
Disease-specific death rates	P	-	P	P	A	A
Proportionate mortality from specific disease	P	-	P	P	A	A
Morbidity:						
incidence rate	-	-	P	P	A	P
prevalence rate	-	-	P	P	A	P
Prevalence of long-term disability	-	-	P	-	A	-

Source: WHO, 1981a.

P = Primary source,
A = Alternative source,
* = Global indicator.

TABLE C

Health status indicators for measuring impact and effectiveness at different levels, drafted by WHO Informal Working Group (1985).

Level	Indicator
Local Health Area	1. Probability of dying by age 2 years
	2. % of infants with birth weights < 2500g
	3. Weight for age 12-23 months
	4. Measles cases
	5. Measles vaccine efficacy
	6. Number of cases with severe dehydration
	7. % severe dehydration among diarrhoea cases
Regional	1. Probability of dying by age 2 years
	2. % of infants with birth weights < 2500g
	3. Weight for age 12-23 months
	4. Neonatal tetanus mortality
	5. Measles morbidity
	6. Poliomyelitis morbidity
	7. Number of cases with severe dehydration
	8. % severe dehydration among diarrhoea cases
	9. Diarrhoea case fatality
	10. ALRTI case fatality
	11. Malaria mortality
National	1. Birth rate
	2. Infant mortality
	3. Child mortality
	* 4. Life expectancy at birth
	5. % of infants with birth weight < 2500g
	6. Weight for age 12-23 months
	7. Maternal mortality
	8. Measles cases prevented
	9. Neo-natal tetanus mortality
	10. Poliomyelitis morbidity
	11. Diarrhoea mortality
	12. ALRTI mortality
	13. Malaria mortality
International	1. Birth rate
	* 2. Infant mortality
	3. Child mortality
	4. Life expectancy at birth
	* 5. % of infants with birth weight < 2500g
	* 6. Weight for age 12-23 months
	7. Maternal mortality
	8. Measles cases prevented
	9. Neo-natal tetanus mortality
	10. Poliomyelitis morbidity
	11. Diarrhoea mortality
	12. ALRTI mortality
	13. Malaria mortality

*Global Indicator

Source: WHO, 1985a (Draft).

TABLE D

Health status indicators recommended for use by selected WHO Regional Offices

Indicator	WHO Regional Office			
	Eastern Mediterranean	European	American	Western Pacific
Life expectancy at birth separately for males and females	Y	-	-	-
Life expectancy at ages 1, 15, 35 & 65 by sex	-	Y	-	-
Maternal mortality	Y	Y	Y	Y
Mortality rates by sex & 5-year age groups for 10 selected causes of death	-	Y	-	-
General mortality by cause & age	-	-	Y	-
Mortality from chronic diseases by cause	-	-	Y	-
Mortality for EPI diseases	-	-	Y	-
Incidence of EPI diseases	-	-	Y	-
Annual incidence rate of each of the 6 EPI target diseases for the most recent 5 years	Y	-	-	-
Latest available data on the annual number of cases of diptheria, tetanus, whooping cough, measles, poliomyelitis or tuberculosis	-	-	-	Y
Incidence of infectious diseases	-	Y	-	-

TABLE D (continued)

Health status indicators recommended for use by selected WHO Regional Offices

Indicator	WHO Regional Office			
	Eastern Mediterranean	European	American	Western Pacific
Morbidity (prevalence and/ or incidence from chronic diseases)	-	-	Y	-
Number of disability days per person per year by level of restriction	-	Y	-	-
Percentage of population experiencing different levels of long-term disability, by age & sex	-	Y	-	-
Persons incapacitated by accidents	-	-	Y	-
Number of working days lost per person, per year, due to disease or injury	-	Y	-	-
Incidence of certified occupational diseases	-	Y	-	-
Incidence of injury purposely inflicted by other persons disaggregated if possible by type of injury, including rape and child battery	-	Y	-	-
Proportion of children having a weight-for-age in relation to reference values at entrance to primary school	Y	-	-	-

Source: Adapted from Hansluwka (1985).

TABLE E

National health status indicators used by the Bangladesh Ministry of Health and Population Control.

Indicator	Disaggregated by
Weight-for-height ('Harvard Standard')	Sex, age groups 0-4 and 5-14 years
Infant mortality rate	-
Life expectancy at birth	-
Fifteen major causes of death as a %age of all causes	-
Proportionate mortality from specific diseases	Age groups 0-28 days, 29 days- <1 yr, 1- <2 yrs, 2- <5 yrs, 0-5 yrs.
Maternal mortality rate	-
Percentage distribution of major causes of morbidity	-

Source: Ministry of Health and Population Control, Bangladesh (1985).

APPENDIX IV

ANNOTATED BIBLIOGRAPHY

Baylet, R. (1979).

The selection of health indicators under specific working conditions in the developing countries.
World Health Organization WHO/HS/NAT.COM/79.361

This short practical document describes some of the steps and decisions involved in the selection of health indicators for particular country settings. Consideration is given to the assessment of information needs, the use of 'ready made' as opposed to 'made-to-measure' indicators. The contradiction between what is desirable and what is feasible in a particular setting is emphasised.

Bice, T.W. (1976).

Comments on health indicators: methodological perspectives.
International Journal of Health Services, 6(3), pp 509-29.

The author discusses several conceptual and methodological problems in the development and use of health indicators. He observes that the quest for elegant mathematical formulations, and the tendency to conceptualize "health" in terms of expansive definitions, retard progress towards producing information useful in decision making. To improve the utility of such information the author recommends that health indicators should measure variables specified by a social system model and be scaled according to units that are relevant to decision-making criteria.

Catford, J.C. (1983).

Positive health indicators: towards a new information base for health promotion.
Community Medicine, 5(2), pp 125-32.

The paper develops proposals for positive health measures suitable for field work testing. It also considers measures of well-being and risk with special emphasis on the latter.

Culyer, A.J. (1983).

Health Indicators.
An International Study for the European Science Foundation.
Martin Robertson & Co. Ltd.

This book is a product of a series of workshops established by the (then) British Social Science Research Council and the European Science Foundation. The aim is to provide a synthetic account of European research in the field of health indicators, to assess current research needs and to make suggestions about future directions of research in Europe and about its organisation. The edited papers cover a number of key issues, including concepts of health and illness, the multi-dimensionality of health indicators, types of indicators for specific uses, and measurement-related problems.

Culyer, A.J., Lavers, R.J. and Williams, A. (1971).

Health indicators: health.
Social Trends, 2, pp 31-42.

This article is one of several papers presented at an international conference on social indicators supported by the (then) Social Science Research Council of Great Britain. It concentrates on the three main requirements of policy decision-makers for indicators:
a). a measure of the 'output' of social policies;
b). a means of deriving the social valuation placed upon different 'outputs';
c). a measure of the technical possibility of increasing 'output'.

Corresponding to each of these are three kinds of social indicators needed in the field of health:
a). measures of the state-of-health ('state' indicators);
b). measures of the need-for-health ('need' indicators);
c). measures of the effectiveness of health-affecting activities ('effectiveness' indicators).

The authors describe the methods used to develop a state-of-health indicator.

Dowler, E.A., Payne, P.R., Seo, Y.O., Thomson, A.M. and Wheeler, E.F. (1982).

Nutritional status indicators: interpretation and policy making role.
Food Policy, May 1982, pp. 99-112.

The authors discuss the usefulness and the limitations of using measures of nutritional status as indicators of the health, welfare and survival capacity of individuals and communities, for use in problem definition, policy-making, and in programme evaluation.

Goldsmith, S.B. (1972).

The status of health status indicators.
Health Services Reports, 87, pp 213.

The author discusses various aspects of health status indicators at length, namely: definition of health, uses of health status indicators, problems encountered in developing adequate measures of health, the present state of the art in measuring health status, the practicality of new health status indicators and lastly, the outlook for health status indicators.

Hansluwka, H.E. (1985).

Measuring the health of populations: indicators and interpretations.
Social Science and Medicine, 20(12), pp 1207-24.

This key paper focuses on the measurement of the health status of the population. It highlights the mainstream of recent developments in the area. The author observes five important and largely unsolved points of controversy in the search for health status indicators, namely: subject of measurement, sources of information, type of measurement, dimension and specificity of measurement, and emphasis on national context verses international comparability.

Holland, W.W., Ipsen, J. and Kostrzewski, J. (eds). (1979).

Measurement of Levels of Health.
World Health Organisation Regional Publications. European Series No.7.

This publication arises from the collaboration of the WHO Regional Office for Europe and the International Epidemiological Association. It is intended to provide guidelines for health professionals who need to undertake measurement of levels of health for purposes of allocating resources, monitoring, and planning health and health-related services.

Jazairi, N.T. (1976).

Approaches to the Development of Health Indicators.
OECD Social Indicator Development Programme Special Studies No.2 Paris.

This report represents one of a series prepared within the OECD Social Indicators Programme which are designed to focus on particular social 'concerns' or aspects of social indicators. The focus of this paper is on the area of health. A 'state-of-the-art' review is presented, followed by a discussion of indicators for five social concerns:

a). length of life;
b). healthfulness of life;
c). quality of health care;
d). delivery of health care;
e). social integration of the disabled.

Moriyama, I.M. (1968).

Problems in the measurement of health status.
Sheldon, E.B. and Moore, W.E. (eds).
In Indicators of Social Change, pp 573-600.
Russell Sage Foundation, New York.

The author devotes the first part of the paper to a lengthy discussion on the inadequacy of mortality rates, (especially the infant mortality rate), as measures of the health of the population. The second half is a general discussion on health indicators, including such topics as the definition of health and disease, possible indicators of health, and the problems in developing a composite index of health.

Murnaghan, J.H. (1981).

Health indicators and information systems for the year 2000.
Annual Review of Public Health, 2, pp 299-361.

The paper commences by discussing the general problems of designing and developing health information systems equal to the task of promoting and monitoring HFA/2000. The author then proposes some priorities and guidelines for organising and focusing the efforts of the many agencies, groups and individuals concerned with health statistics. The latter sections of the paper concentrate on the situation in less developed countries. An illustrative set of health indicators for national planning in a developing country is used to take stock of available concepts of measurement, to test their relevance and feasibility and to consider the steps necessary to translate these concepts into operational health information systems.

Noordin, R.A. (ed) (1979).

Development of Operational, Performance and Impact Indicators with Special Reference to Community Health.
Proceedings of the 6th SEAMIC workshop, Kuala Lumpur, Malaysia, 13-19th Feb. 1979.
SEAMIC Publication No.17, 1979, South East Asian Medical Information Centre, Tokyo.

The Workshop was attended by representatives from Australia, Fiji, India, Indonesia, Japan, Malaysia, Singapore, South Korea, and Thailand. The Proceedings include discussions on the needs and problems related to indicators for planning, management and evaluation. The findings of the separate Workshop sessions are presented, including suggestions on operational, performance, and impact indicators for specific programmes. Profiles are given for particular countries describing relevant past and present activities.

Organization for Economic Co-operation and Development (1982)

The OECD List of Social Indicators.
The OECD Indicator Development Programme, No.5. 1982.

This report is one in a series of OECD publications and consolidates all the social indicators agreed under the aegis of the OECD, together with specifications, statistical guidelines and disaggregations.

Payne, P. (1985).

Appropriate Indicators for Project Design and Evaluation.
UNICEF/WEP Workshop on Food Aid and the Well-being of Children in the Developing World. New York.

The main concern of the paper is with indicators which currently are, or might be, used to assess the effectiveness of projects with respect to health/nutrition. The first part focuses on indicators of food consumption, nutrition and health status. The author highlights the various schools of thought, pointing out the merits and weaknesses of the theories underlying the choice of indicators. The second part concentrates on project design. This aspect is covered by a discussion of how indicators might be selected through consideration at each stage in the sequence 'inputs-outputs-effects-impacts' of a set of explicit project hypotheses about the causal processes believed to be involved.

Seigmann, A.E. (1976).

A classification of socio-medical health indicators: perspectives for health administrators and health planners.
In Elinson,J and Siegmann, A.E. (eds) pp 197-211.
Socio-medical Health Indicators.
Baywood Publishing Company, New York.

The paper begins by examining the inter-relationship of health problem patterns and frames of reference for defining and measuring health. Next, the author tries to explain why mortality and morbidity rates by themselves no longer serve to assess a population's health status in developed countries. The third section relates a society's predominant disease patterns to the appropriate measures for assessing the health status of the population. The paper concludes by reviewing the current importance of selected socio-medical health indicators.

World Health Organization. (1981).

Development of Indicators for Monitoring Progress Towards Health for All by the Year 2000.
Health for All Series, No.4.

The volume is intended to help member states of the WHO decide which indicators to use, particularly at the national level for monitoring progress towards HFA/2000. It proposes four categories of indicators: health policy indicators, indicators of the provision of health care, indicators of the coverage of health care; and indicators of health status, including quality of life. Emphasis has been given to the information requirements for the various indicators, the principal sources of data, and the alternative methods of data collection and analysis involved.

World Health Organization. (1983).

WHO meeting on maternal and child health indicators for Health for All by 2000: evaluation of alternatives.
WHO/HS/NAT.COM/83.383.

This paper is the result of a meeting sponsored jointly by the WHO Divisions of Family Health and Epidemiological Surveillance and Health Situation and Trend Assessment. The objectives of the meeting are clearly reflected in the comments of the report. The document evaluates and critically reviews past data collection experiences, systematically reviews existing and potential indicators for the evaluation and monitoring of MCH/FP programmes and lastly, discusses the problems and alternative methods of obtaining the necessary data for the construction of these indicators.

World Health Organization. (1985).

Report of an informal working group on the evaluation of health effectiveness and impact, 17-28 June 1985, Geneva.
DES/EI/85.1. Draft.

The informal working group was convened by the Health Situation and Trend Assessment Programme. The aim was to review existing methods for the evaluation of the effectiveness and impact of selected health programmes and to propose methods that are specific, sensitive, relevant, applicable and affordable to countries, particularly developing countries. The group focused attention on countries with infant mortality rates greater than 50 per thousand live births and on five specific programmes: prevention and control of childhood diseases subject to immunisation, acute diarrhoea, acute respiratory infections, malaria and malnutrition. A limited range of indicators were selected and special attention given to the data requirements, the major sources of data and the methods of analysis for the selected indicators. The report emphasised the need for the measurement of effectiveness and impact at four levels; local, regional, national and international.

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