

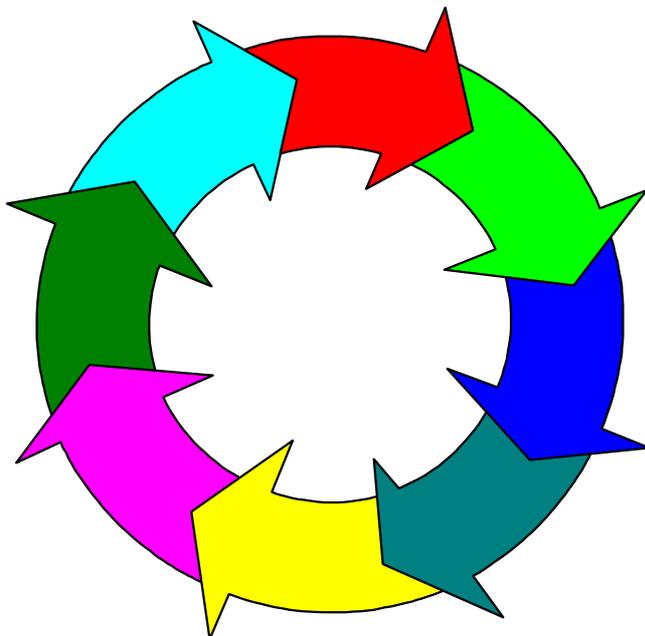
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# MONITORING EQUITY IN HEALTH: A POLICY-ORIENTED APPROACH IN LOW- AND MIDDLE-INCOME COUNTRIES

by Paula Braveman for the

World Health Organization (W.H.O.)

Division of Analysis, Research, and Assessment



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## Acknowledgements

This document is the product of work by many individuals over a three year period of time, through WHO activities supported by the Swedish International Development and Cooperation Agency (SIDA). The following individuals are acknowledged here for their valuable comments on various drafts of this document:

Dr. Leonel Arguello, Dr. Moustapha Azelmat, Dr. K. Behbehani, Dr. Rex Billington, Dr. Susan Egerter, Dr. George Fernando, Ms. Lucy Gilson, Dr. Davidson R. Gwatkin, Dr. V. Habiyambere, Dr. Norman Hearst, Dr. P. Heiktamp, Dr. F.B.P. Kean, Dr. A Koné-Diabi, Dr. Anton Kunst, Dr. Rene Loewenson, Dr. Elise Le Franc, Dr. Daniel G. Makuto, Dr. Clair Mills, Dr. Desmond O'Byrne, Dr. Jonathon D. Quick, Dr. Dev K. Ray, Dr. Anna Ritsatakis, Dr. Steve Sapirie, Dr. S. Siméant, Dr. Barbara Starfield, Dr. Sissel H. Steen, Dr. E. Tarimo, Dr. F. Toral.

In addition, all the participants in a **meeting on policy-oriented monitoring of equity in health and health care** held in Geneva in September 1997, who are too numerous to list here, contributed to this work by participating in the technical discussions at that meeting. However, any shortcomings of this document are the sole responsibility of the author.

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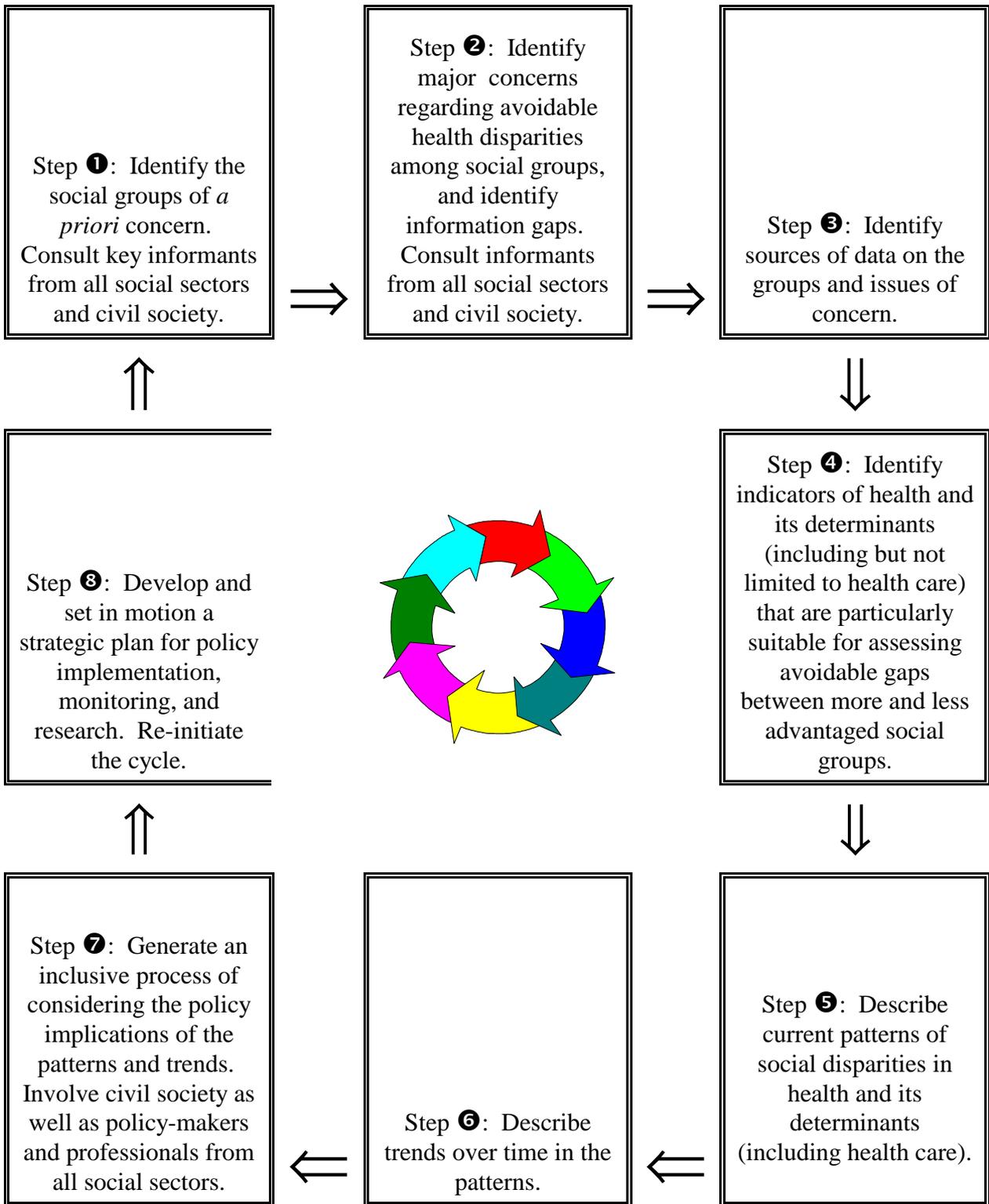
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## EXECUTIVE SUMMARY

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- ❑ This document gives an overview of a practical approach to monitoring social disparities in health within countries for the purpose of guiding policies. The material is intended to raise issues for further exploration among researchers, policy analysts, policy-makers, and other advocates for the public's well-being, concerning their best options for obtaining information on a routine and ongoing basis to guide action to reduce avoidable social disparities in health in their countries.
  - ❑ "Equity in health" is operationally defined as minimizing avoidable disparities in health and its determinants -- including but not limited to health care -- between groups of people who have different levels of underlying social advantage. In virtually every society in the world, differences in social advantage are reflected by socioeconomic, geographic, gender, ethnic, and age differences; other dimensions can be important as well. Equity in health implies that need rather than underlying social advantage is considered in decisions about resource allocation that affect health.
  - ❑ The primary goal of monitoring is to serve as an early-warning system. Monitoring should raise questions for further investigation, but generally will not explain the causes of widening, stagnant, or narrowing gaps. More complex methodologic and explanatory research are needed to guide and complement the simpler approaches suitable for ongoing monitoring.
  - ❑ WHO's work on monitoring equity is only one component of a broader strategy focused on achieving greater equity in health, arising from the following considerations:
    - Income inequalities are wide and, in many cases, widening between social groups in low-, middle-, and high-income countries on all continents. Income inequalities are likely to have adverse health consequences.
    - The usual methods for monitoring health and health care often obscure large gaps between social groups within a country.
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- Global pressures are making it difficult for governments to implement and sustain equitable policies.
  - For all these reasons, equity needs to be placed higher on the policy agendas of national and international agencies, and countries need to monitor not only average statistics but also differences between more and less advantaged social groups in key measures of health and its determinants, including health care.
- ❑ The approach suggested here is based on the following basic assumptions:
- Better data and methods are needed to monitor equity, but in virtually every country in the world -- even the poorest nation with the most meager data -- far more could be done now with existing data and simple methods.
  - Any technical strategy for monitoring equity must be placed within the context of a broader strategy to address the formidable political obstacles to achieving greater equity.
- ❑ The recommended approach to monitoring equity can be summarized in 8 steps depicted on the next page:
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## **Eight steps in policy-oriented monitoring of equity in health**

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## MONITORING EQUITY IN HEALTH: A POLICY-ORIENTED APPROACH IN LOW- AND MIDDLE-INCOME COUNTRIES

***"...the undertaking to reduce health inequalities will remain an empty gesture unless radical steps are taken by governments to seek better information, undertake large-scale experiments, introduce anti-poverty policies, give priority to healthier life-styles and monitor the effects of those on the health of the population as a whole and on the poorest groups in particular."*** [Sir Douglas Black (for whom The Black Report on social inequalities in health in the UK was named), in the preface to *The Health Divide*, 1988] (Black, Townsend *et al.*, 1988)

### Chapter I: BACKGROUND

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#### The purpose of this document

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This document presents an overview of a practical approach to monitoring social disparities in health for the purpose of guiding national policies. Avoidable disparities in health between social groups are large throughout the world, both *between* and *within* countries on all continents and of all income levels. While both concerns are crucial, the focus here is on the assessment of health equity *within* countries; between-country differences have often received more attention until now, yet distinct challenges arise in trying to obtain and use information on differences within national borders. While WHO's prior technical work on equity has focused primarily on Europe, people in most low- and middle-income countries who want to assess equity within their national borders face particular challenges. Therefore, while it is hoped that this material will have some relevance to all countries, the priority has been to address the needs of people in low- and middle-income countries who want information to help them develop more equitable national policies.

The document as a whole is intended to raise issues for further exploration among researchers, policy analysts, policy-makers, and other advocates for the public's well-being, concerning their best options for obtaining information on a routine and ongoing basis to guide policies to reduce avoidable social disparities in health in their countries. The detailed table of indicators, comparisons, and data sources (Chapter III), and the discussions of selected technical issues in Chapter IV are intended to be a resource for researchers who are directly engaged in

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collecting, analyzing, and presenting information to decision-makers and the public. The material is directed to people in ministries of health, universities, non-governmental organizations, and other public and private sector agencies concerned with policies affecting public health.

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### **What is “equity in health”?**

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- “Equity in health” is operationally defined as minimizing avoidable disparities in health and its determinants -- including but not limited to health care -- between groups of people who have different levels of underlying social advantage or privilege, i.e., different levels of power, wealth, or prestige due to their positions in society relative to other groups.**
- In virtually every society in the world, differences in social advantage are reflected by socioeconomic, geographic, gender, ethnic, and age differences; other dimensions can be important as well.**
- Equity in health implies that need rather than underlying social advantage is considered in decisions about resource allocation that affect health.**

**Equity** is an ethical concept that eludes precise definition. Synonyms are **social justice** or **fairness**, which certainly mean different things to different people at different times. Equity implies that need rather than social advantage is considered in decisions about resource allocation. Equity is not the same as equality; inequities are inequalities that are judged to be unfair, i.e., both unacceptable and avoidable.(Whitehead, 1992) Different societies may have different goals for equity as well as different rates of speed at which they are prepared to move toward those goals. For example, some societies may frame their equity goals in terms of a commitment to achieving a specified absolute minimum standard of health and health care for all, including the worse-off groups, but not in terms of reducing avoidable gaps after the worse-off have attained that minimum standard. Other societies will set their goals for the health of worse-off groups in relation to the levels of well-being experienced by better-off groups; improvements for better-off groups are seen as reflecting what is possible for all, and equity is viewed as requiring a sharing of progress. While the latter perspective is the point of departure for the approach to monitoring recommended here, most of the material in this document should be relevant to both perspectives.

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In this document, the terms “health” and “health care” have distinct meanings. **“Health”** means **health status**, that is, physical, psychological, and social well-being and functional capacity. Health must be distinguished from health care, which is just one of many determinants of health status. **“Health care”** is used broadly here to represent all the major aspects of health services, i.e., **health care resource allocation and financing, and the utilization and quality of health services.**

Equity in health status refers to the attainment *by all people* of the highest possible level of physical, psychological and social well-being that biological limitations permit, noting that many biological limitations are amenable to modification. For example, the functional limitations associated with many physical handicaps can be markedly altered with basic measures (such as providing wheelchairs, installing protective railings, or providing physical training to increase mobility and strength); and the degree of impairment associated with many psychological and physical conditions is highly related to the degree of social stigmatisation or acceptance.

Equity in health care means that health care resources are allocated according to need, health services are received according to need, and payment for health services is made according to ability to pay. Equity in health care implies a commitment to ensuring high standards of real (not only theoretical) access, quality and acceptability in health services for all. The geographic location of facilities and personnel reflects potential access with respect to geographic barriers. Real access, which requires overcoming many different kinds of barriers (e.g., language barriers, lack of knowledge, or perceived poor quality of available services) in addition to geographic and financial obstacles, can only be determined by measuring the quantity, nature, and quality of the services that people actually receive.

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**What is meant by monitoring equity in health?  
What is policy-oriented monitoring?**

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- Policy-oriented monitoring of equity in health is the ongoing assessment of current patterns and trends over time in social inequalities in health and its determinants, focusing on inequalities that are likely to be unfair and avoidable. The assessment is performed to guide policy in the short- and intermediate-terms as well as on a long-term basis.**

**“Monitoring equity”** implies an ongoing assessment of how different social groups are faring in absolute terms as well as the size of gaps between groups. The primary goal of monitoring is to serve as an early-warning system, to indicate whether the combined effects of all the policies influencing equity in health appear to be heading in the right direction, i.e., toward

both an absolute improvement for everyone and a narrowing of the avoidable gaps. Monitoring should provide an overview of a general situation and raise questions for further investigation, but generally will not explain the causes of widening, stagnant, or narrowing gaps. Carefully focused explanatory research, designed to answer specific questions about relationships between specific factors, is needed to make causal inferences. Monitoring and explanatory research complement each other. For example, research has demonstrated a powerful relationship between tobacco use and both cardiovascular disease and cancer. Based on knowledge from explanatory research, it would be rational for a country to monitor changes in tobacco use in relation to its policies. A commitment to equity would require monitoring not only tobacco use overall (population averages), but also rates among different social groups; this would be based on awareness that different approaches might be more or less successful in reaching different social groups, and on the belief that equity requires ensuring that those in greatest need -- who often are harder to reach -- receive the greatest benefit.

Because monitoring involves repeated examination over time to see how a situation may be changing, it requires methods that can be sustained in an ongoing fashion. This often restricts the methods that can be used for monitoring to a simpler, lower-cost subset of those that might be feasible in a one-time research effort. Ideally, the simpler methods used for ongoing monitoring are developed and validated based on more complex research.

**General requirements of a policy-oriented monitoring process**

- ***relevance to policy***    **The information should be useful to guide short- and medium- as well as long-term actions.**
  - ***reliability***            **The data to be used must be of sufficient quality to be a reliable basis for guiding policy; absence of bias will often be more important than precision.**
  - ***simplicity***            **The techniques required for both data collection and analysis must be feasible for the local personnel who will perform these functions in an ongoing fashion.**
  - ***affordability***        **The resources needed for all requisite activities (data collection, quality control, analysis, presentation) must be within reach during the time period under consideration.**
  - ***sustainability***        **It must be possible not only to carry out the effort as a one-time investigation, but to sustain the entire process on a routine basis over time.**
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- ***timeliness***            **If the time lag to produce the information is too long, a given approach that might eventually yield useful information may not be suitable for policy-oriented monitoring, at least with respect to short- or medium-term policy questions.**

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In many -- if not most -- cases, monitoring equity in health will reveal problems requiring action outside as well as within the health care sector. One of the essential functions of the health sector should be to detect important health effects of policies in any sector and to call for investigation and action by all relevant sectors. It is not necessarily the health sector's role to recommend the particular actions to be taken by other sectors, but rather to serve as a watchdog, an early-warning mechanism generating timely multi-sectoral analysis and action.

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- **The primary goal of monitoring is to serve as an early-warning system.**
  - **Monitoring should raise questions for further investigation, but generally will not explain the causes of widening, stagnant, or narrowing gaps.**
  - **More complex methodologic and explanatory research are needed to guide and complement the simpler approaches suitable for ongoing monitoring.**
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### **Why is WHO focusing on monitoring equity in health and its determinants? And why now?**

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WHO's work on monitoring equity is only one component of a broader strategy focused on achieving greater equity in health.

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|---|
| <ul style="list-style-type: none"><li><input type="checkbox"/> <b>Objectives of WHO's overall strategy on equity</b></li><li><input type="checkbox"/> <b>to put the achievement of greater equity in health higher on the agendas of national and international agencies during a period when global trends can put equity in jeopardy or make it an afterthought.</b></li></ul>  |
| <ul style="list-style-type: none"><li><input type="checkbox"/> <b>to strengthen national capacity to develop and implement sustainable policies to achieve greater equity in health; this includes capacity for policy-oriented research and monitoring of equity in health and its determinants, including health care. Sustainable policies will be effective and as efficient as possible.</b></li><li><input type="checkbox"/> <b>to facilitate the sharing of experiences in trying to reduce inequities in health despite challenging political and economic obstacles.</b></li></ul> |

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Although relevant routinely-collected data are scarce, considerable evidence has accumulated from special studies revealing that, even where population averages suggest overall progress, avoidable disparities in health status and health care between different social groups in countries throughout the world are often wide and widening or stagnant. For example:

**q Socioeconomic inequities:** The life expectancy at birth of the poorest segment of the population in Mexico is 20 years shorter than that of the richest segment.(United Nations Development Programme, 1991) In Bolivia, most public spending on health services goes toward care for people belonging to the upper 40 percent of income groups.(Unidad de Analises de Politicas Sociales, 1993) In Indonesia in 1990, only 12% of public spending for health care was for services received by the poorest 20% of households, who would be expected to need more health services because of poverty's role in illness; the wealthiest 20% consumed 29% of the government subsidy in the health sector, (World Bank,1993) despite having better health status and more private resources. A large body of literature has documented socioeconomic inequalities in mortality in Europe, even in countries where health care is relatively equitable.

**q Geographic inequities:** In Nigeria, life expectancy in the Borno region is only 40 years, 18 years less than in the Bendel region; adult literacy, one of the strongest determinants of health status, is 12% in Borno -- one-quarter of the national average.(United Nations Development Programme, 1994) In Peru, the infant mortality rate in some rural areas is as high as 150 per 1,000 live births, while in the capital city, Lima, it is 50 per 1000.(Pan American Sanitary Bureau and United Nations Economic Commission for Latin America and the Caribbean, 1994)

**q Gender inequities:** A study in India showed that female infants 1 to 23 months of age were almost twice as likely to die by the age of two as were males, and concluded that the most likely explanation was not biological differences but different behavior of families toward male and female children.(Das Gupta, 1987) Another study concluded that the death of one out of every 6 female infants in India, Bangladesh, and Pakistan was due to neglect and discrimination.(United Nations Population Fund, 1989) Examples of bias against girls in access to modern health services have been cited from Korea, Togo, Sierra Leone, Nigeria, Jordan, Algeria, Syria, and Egypt.(Kutzin, 1993)

**q Ethnic inequities:** Until recently, more than 4 times as much money was spent on health care for whites as for blacks in South Africa; (Yach and Harrison, 1995) reversing the health effects of apartheid is unlikely to be easy or rapid. In the United States of America, the gap in infant mortality between whites and blacks has widened over time.(Singh and Yu, 1995) A 1994 study in a large U.S. city observed differences in the adequacy of pain medication administered to people in different ethnic groups presenting to an emergency department with similar medical conditions; the differences were not explained by linguistic barriers.(Todd, Lee, *et al.*, 1994) In Guatemala, malnutrition rates during the 1980s were 40% higher among indigenous compared with non-indigenous children.(Psacharopoulos, Morley, *et al.*, 1993)

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Studies of child mortality have demonstrated ethnic disparities within Peru, Sri Lanka, Thailand, and many African countries that persist even after controlling for several other factors including socioeconomic measures.(United Nations, 1985)

WHO's commitment to equity is not new. The organization's Constitution states that the attainment of the highest possible standard of health is a right of *all* people. The Primary Health Care approach was formulated as a means to achieve "Health for All by the Year 2000," the organization's rallying call since 1978. Recent efforts build on the decades of prior work, but also are based on a reassessment of strategies in light of prevailing global trends.

One might ask: What is the difference between a commitment to equity and a commitment to alleviate poverty? Or a commitment to increase access to health care and basic social services for disadvantaged populations? A commitment to equity implies commitments both to alleviate poverty and increase access to services, but at the same time it implies more. It implies a commitment to an equitable sharing of opportunities for health and well-being; it implies a view that it is unacceptable for some people, solely because of being disadvantaged in society, to have unnecessary suffering, physical disability, or limited mental development, or to die before their time, when people without those social disadvantages are able to escape these conditions. Equity implies a commitment to reduce the health-damaging effects of underlying social inequities as much as possible through the provision of health services, but also to contribute toward achieving reductions in the underlying social inequities themselves.

In the face of increasing market orientation and globalization, with privatization and public sector reductions worldwide, most countries are finding it difficult to implement and sustain equitable policies. The WHO initiative aims to make the reduction of social disparities in health a higher priority on the agendas of national and international organizations, recognizing the pressures created by global trends in all sectors. It aims to strengthen countries' capacities to develop, implement, and evaluate policies to promote equity in health and its determinants, including--but not limited to--health care. One way to do this is to encourage the international exchange of experience with efforts to reduce inequities under challenging conditions. Another is to strengthen countries' capacities to conduct policy-oriented research and ongoing monitoring.

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**q The rationale for WHO's current work on monitoring equity in health**

- Ø Income inequalities are wide and, in many cases, widening between social groups in low-, middle-, and high-income countries on all continents.(United Nations Development Programme, 1996) Both absolute and relative income inequalities are likely to affect health adversely.(Wilkinson, 1992; Wilkinson, 1992; Kaplan and Keil, 1993; Kaplan, 1996; Kaplan, Pamuk, *et al.*, 1996; Kennedy, Kawachi, *et al.*, 1996; Wilkinson, 1996; Kawachi and Kennedy, 1997; Lynch, Kaplan, *et al.*, 1998)**
- Ø The usual methods for monitoring health often obscure large gaps between social groups within a country.**
- Ø Global pressures are making it difficult for governments to implement and sustain equitable policies.**
- Ø For all these reasons, equity needs to be placed higher on the policy agendas of national and international agencies, and countries need to monitor not only average health and health care statistics but also differences in key measures between more and less advantaged social groups.**

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## Chapter II. A POLICY-ORIENTED APPROACH TO MONITORING EQUITY IN HEALTH AND ITS DETERMINANTS

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### Assumptions underlying the approach presented here

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The approach suggested here is based on the following basic assumptions:

- Better data and methods are needed to monitor equity, but in virtually every country in the world -- even the poorest nation with the most meager data -- far more could be done now with existing data and simple methods.**
- Any technical strategy for monitoring equity must be placed within the context of a broader strategy to address the formidable political obstacles to actually achieving greater equity.**

In many cases, information on inequities already exists but has not been used; in some cases, equitable policies may in fact already have been officially adopted but not implemented. Thus, when defining the particular issues that should be studied and monitored, researchers must carefully consider in each case whether there truly is insufficient information describing the extent and nature of avoidable inequalities in a given aspect of health, or whether the real problem is a lack of application of existing information for political or technical reasons. If the latter is true, then what is needed is a better understanding of the nature of the obstacles and how to overcome them, rather than the collection of more data describing the inequities or the causal mechanisms leading from the inequities to ill health. In most cases, there will be a need for *both* more information on inequities and better application of existing knowledge.

The technical aspects of the recommended approach to monitoring equity can be summarized somewhat simplistically in eight steps described below. While most of these eight steps are formulated here as primarily technical and scientific activities, it is essential to keep in mind that such activities are carried out within the context of a larger process which is profoundly political--and often conflictive--in nature. Achieving greater equity generally requires real changes in resource allocation to favor disadvantaged groups, who by definition are less influential. While many members of more advantaged groups will subscribe to the notion that achieving greater equity is likely to yield benefits for all members of a society, some segments are likely to resist actions that appear to involve redistribution. Hence, information exposing inequities is at particular risk of being ignored, covered up, or discredited. Because of

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this, the scientific quality of such information must be especially sound and well documented. In addition, there must be a carefully conceived strategic plan for collection, dissemination, and application of information, involving an appropriate range of participants in the process of framing questions and in interpreting implications for action once the information is presented; most researchers will need to form partnerships with persons or groups who have the requisite experience and skills.

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### **The approach outlined in eight steps**

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The suggested steps are presented here in a sequential manner, but it should be noted that in some cases the order is arbitrary. For example, the activities required to accomplish Step 1 (identifying the social groups and subgroups of concern), Step 3 (selecting data sources), and Step 4 (selecting indicators of health and its determinants to make comparisons among more and less advantaged social groups) clearly overlap. One cannot select data sources without knowing both the social groups that should be compared and the range of potential indicators for making relevant comparisons within and between the groups. Likewise, one cannot select either the social groupings or the indicators of health and its determinants that will be used without considering the availability of suitable data sources. In reality, one makes a preliminary assessment of all these concerns (desired social groupings, suitable indicators, and potential data sources), gradually modifying one's selections of social groups and indicators from among a range of possibilities that could meet scientific criteria, based on the feasibility of obtaining reliable information on them in potentially accessible data sources. Similarly, many analytic issues considered in Steps 5 and 6, regarding the description of patterns and trends, also have implications for the choice of social groups, indicators, and data sources.

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**❑ Eight steps in policy-oriented monitoring of equity in health and its determinants**



- ➔ **Step ①** Identify the social groups of *a priori* concern. Consult representatives of all social sectors and civil society, including advocates for disadvantaged groups.
- ➔ **Step ②** Identify general concerns and information needs related to equity in health and its determinants. Again, consult representatives of all social sectors and civil society, including advocates for disadvantaged groups.
- ➔ **Step ③** Identify sources of data on the groups and issues of concern.
- ➔ **Step ④** Identify indicators of (a) health status, (b) major determinants of health status apart from health care, and (c) health care (financing, resource allocation, utilization, and quality) that are particularly suitable for assessing avoidable gaps between more and less advantaged social groups.
- ➔ **Step ⑤** Describe current patterns of avoidable social inequalities in health and its determinants.
- ➔ **Step ⑥** Describe trends in those patterns over time.
- ➔ **Step ⑦** Generate an inclusive and public process of considering the policy implications of the patterns and trends. Include all the appropriate participants in this process (all relevant sectors, civil society, NGOs).
- ➔ **Step ⑧** Develop and set in motion a strategic plan for implementation, monitoring, and research, considering political as well as technical obstacles and including the full range of appropriate stakeholders in the planning process.
- ➔ Repeat the entire process from the beginning, incorporating new knowledge and awareness.

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**→ Step 1: Identify the social groups of *a priori* concern.**

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Which social groups (e.g., defined by socioeconomic, ethnic, gender, geographic, or age characteristics) are of greatest concern with respect to equity in health and its determinants, based on *a priori* knowledge of how social advantage is distributed in the society? Within these groups, what subgroups with different levels of social advantage should be examined? For example, assuming that there are concerns about health and health care inequities among socioeconomic groups (a safe assumption anywhere), how should people be categorized into subgroups according to different levels of socioeconomic advantage? Are two subgroups (poor and non-poor) sufficient in your setting, or are at least five or more subgroups (e.g., income/expenditure quintiles or deciles) needed to capture the range of meaningful differences? Are there concerns about gender equity with respect to health or its determinants, including but not limited to health care? Are there concerns about inequities along ethnic lines, and, if so, what are the relevant ethnic groupings? The initial identification of groups and subgroups of concern is based on existing knowledge of who is likely to be at risk of poorer health or health care for reasons related to social disadvantage. Key informants must be consulted who represent other social sectors, as well as the health sector, and civil society, including advocates for disadvantaged groups.

The term “*socioeconomic*” is used here specifically to refer to the possession of or access to control over economic resources. By contrast, the term “*social*” is used as a more general term, encompassing not only socioeconomic factors but a range of other factors that differentiate subgroups of people from other subgroups, e.g., the geographic areas where they reside, being female versus male, being a member of a given ethnic or religious group, or being in a certain age category.

As discussed earlier, assessing equity requires making comparisons between social groups with different levels of social advantage (i.e., power, wealth, or prestige). In virtually every society in the world, social advantage varies according to socioeconomic, geographic, gender, ethnic/religious, and age differences. Other dimensions can be important as well, for example, discrimination according to political affiliation, sexual orientation or particular physical or mental conditions that can be stigmatized by a society during a certain period of time. In different contexts, one will want to monitor equity by making comparisons among groups of people defined in a number of ways, for example, between people with and without health insurance coverage; people in particular occupational groups; or using other characteristics to define groups about whom there are suspected equity concerns.

Once the broad kinds of social groups of concern (e.g., gender groups, socioeconomic groups, or ethnic groups) have been identified, one must decide how to divide a given group into

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subgroups with varying levels of social advantage. For example, one must decide how to group people according to how much wealth or education they have, or into different ethnic groups, or according to the geographic areas (e.g., province, district, village, or neighborhood) where they live. This requires choosing criteria for categorization, and determining how many different subgroups will be compared with each other; only in the case of assessing gender equity are the subgroupings already determined. The classification scheme used can have important implications in terms of one's ability to obtain useful information. The choice of classification schemes must be determined according to the relevant issues in a given setting, but the recommendations presented in Chapter IV.A. may be helpful in many settings. When one is fortunate enough to have a choice between various options, one should use the groupings considered more meaningful and accurate by knowledgeable researchers who have studied the issues locally; where more than one approach seems valid, it is helpful to repeat one's analyses using different classifications, to see if the conclusions from the findings vary substantially. The validation of measures classifying people into socioeconomic groups is an important area of research needed to guide monitoring efforts.

❑ **Validation studies.** A validation study of a given classification scheme (e.g., one to categorize people socioeconomically or by ethnic group) is one that systematically assesses how well the use of that classification system seems to categorize people into groups corresponding with one or more other classification systems that were of established validity in making the relevant (e.g., socioeconomic or ethnic) distinctions. The validation study would need to make independent measurements using both the classification scheme being tested and one or more other classification schemes that were of more established validity but could be more expensive or complex to use, or have some other limitation that explained why one was proposing to use a new scheme. Demonstrating good correspondence between the results obtained using the newer and simpler or less expensive (or otherwise superior) classification scheme and those obtained using the more complex method of known validity, would then be the basis for feeling comfortable in using the simpler or otherwise better method in ongoing monitoring. Validation studies generally must be repeated periodically to make sure that an approach that seemed valid at one point in time remains valid over time; the validity could change in relation to any one of many factors.

❑ **Statistical concerns.** Ideally, in classifying people into different social groups, it is desirable to make the finest distinctions that are meaningful, which means using a greater number of categories that are more clearly heterogeneous on the relevant characteristic (e.g., income deciles rather than terciles). However, in practical terms one will be limited by considerations of the numbers of people in each category, as well as by the precision allowed by the data source being used. With smaller numbers in the subgroups being compared, the possibility needs to be kept in mind that an apparent difference between groups (or within a given group over a short period of time) could be only a reflection of random variation, not a reflection of a real difference that needs to be addressed. At the most local levels, in particular, if the sizes of population groups are limited, certain indicators that could be very relevant to policy concerns may not be possible to

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monitor, at least in a quantitative fashion; sometimes one can overcome the problem of small numbers in each group by aggregating multiple years of data, but this may not always be suitable for policy-oriented monitoring, with respect to the need for timeliness.

❑ ***Classifying people into socioeconomic (and geographic) groups.*** Chapter IV. A. discusses some options for classifying people into socioeconomic and geographic groups. General options are presented for classifying people socioeconomically according to the following types of measures:

- ❑ ***household income, expenditures, or consumption***
- ❑ ***household economic assets or accumulated wealth***
- ❑ ***educational attainment of adults in household***
- ❑ ***occupation***
- ❑ ***microgeographic markers***

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**→ Step 2: Identify major concerns about avoidable health disparities among social groups, and identify the key information gaps that are obstacles to developing informed policies.**

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What are the general issues of current concern in the country regarding equity in health and its determinants (i.e., avoidable disparities related to social disadvantage)? For example, there may be concern that health sector reform could be leading to wider gaps in utilization and quality of health services between very poor people and others, or that basic living conditions (e.g., food supply, housing) are deteriorating for poor people relative to general economic changes with likely adverse health effects. Or some people could be advocating to continue funding or to put additional resources into expanding the scope of a particular policy, based on belief that the policy was having a positive effect on achieving greater equity; evidence would be needed regarding the areas in which improvement was being claimed.

To identify areas of major concern, it is crucial that there be a sufficiently wide process of consultation with a range of stakeholders. The process must include representatives of civil society and NGOs who will advocate for the generally voiceless disadvantaged groups. Other important consultants about issues of major concern include health workers at all levels and workers from other social sectors (e.g., teachers, social workers) who are aware of population needs. This consultation process should also help to identify the social groups suspected to be at risk of poor health and/or health care for reasons related to their social disadvantage.

As noted above in the discussion of Step 1, in many cases useful information – in quantitative or qualitative forms – already exists but is not being utilized; furthermore, equitable policies may exist on paper but are not being implemented. Before setting the agenda for the

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questions to be examined by a policy-oriented research or monitoring effort, one must ask: What information is truly needed to guide action? And how much of the information that is needed is already available but not being used? How would additional information be used to help achieve more equity in health? Along with careful review of the existing published and unpublished literature, consultation with non-researchers who are policy-makers and advocates will help to clarify these issues.

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**→ Step ③: Identify data sources containing useful information on the groups and issues of concern.**

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What are the best available data sources in your setting to assess and compare systematically the health status and major health determinants of the more and less advantaged social groups, with respect to the issues of major concern? Before designing new data collection efforts, one should consider existing data sources, and how to improve them if necessary. It is important to consider sources of information from outside the health sector. Some of the most useful data sources for monitoring equity in health and health care are often not under the aegis of health authorities, but are collected by the census office, social welfare agencies, or the finance or labor sectors; intergovernmental and at times nongovernmental agencies may be important sources as well. The quality of data need to be assessed carefully, but especially in the case of policy-oriented monitoring, being representative of the population including disadvantaged groups, and a lack of bias, may be far more important than high degrees of precision. The earlier discussion (Chapter I) of key requirements of a policy-oriented monitoring process and material presented later regarding Step 4, raises key issues relevant to the selection of data sources for assessing equity.

**□ Potential sources of data to consider for monitoring equity**

Chapter IV. B. discusses some promising sources of data under two major categories: *existing sources* and approaches requiring *new data collection efforts*. The options presented are not intended to constitute an exhaustive list, but to suggest potential opportunities.

**□ Existing data sources that should be seriously considered as options to use in assessing equity include:**

- vital registration (birth and death records);
  - census data (including inter-census estimates that may be available from a range of agencies);
  - the Demographic and Health Surveys (DHS) and other similar surveys;
  - the Living Standards Measurement Study (LSMS) and similar surveys; and
  - community-based monitoring systems.
- Approaches requiring new data collection efforts that should be considered for assessing equity when suitable existing sources cannot be identified are:**

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- periodic exit interviews at a sample of health care facilities;
  - community surveys using rapid assessment methods;
  - sentinel populations or sentinel territories; and
  - qualitative or quantitative information from key informants.

**Facility-based data: words of caution and encouragement**

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One of the most critical concerns in considering the use of data to assess equity is that data are needed that are truly representative of the population, including the most disadvantaged people. Facility-based data – the data sources likely to be most easily obtained because they are routinely collected by health ministries, hospitals, and health centers – may not be representative of the population; facility-based data reflect only users of health care facilities who may not include (or may under-represent) the least advantaged people.

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Facility-based data are information collected at clinical facilities. Caution should be exercised when using facility-based data to assess equity. Data that are truly population-based are representative of the entire population, including disadvantaged groups. By contrast, data from clinical facilities reflect those who use the facilities. Health-care workers in the public sector often assume they are serving the entire population of needy people in their geographic area. Often, however, the most needy people do not use health-care facilities or may use facilities less frequently than those who are somewhat better-off, even when there is no direct financial charge for receiving the services. This may be because the most needy are less educated, because they believe their health problems are an inescapable part of life, because they cannot afford the cost of transport or lost productivity involved in seeking services, or because they cannot afford to purchase prescribed medicines which are not part of the free consultation. Especially where there are user charges, differential under-use of facilities by the poorest people should be suspected, making it unacceptable to infer from the users of services to the population as a whole.

Furthermore, the quality of facility-based data is often poor, in part because those collecting the data rarely see these data actually being used and hence feel little motivation to collect them accurately. In addition, procedures for training the personnel who collect the data or for data quality control are rarely adequate. Data elements (e.g., what constitutes a “visit” or “encounter” or a given type of visit, or how age groups are categorized) are likely to vary across sites, making it difficult to combine and/or compare data from different facilities.

It is often useful to consider facility-based data along with population-based data, to assess which population groups are likely to be in need of health care but are not using the services or are not using them as much as would have been predicted based on their level of need relative to other groups who use the services more; see issues discussed under Step 5 and in Chapter IV. D. Population-based data can be qualitative or quantitative, as long as systematic thought has gone into ensuring that they reflect the entire population including the most disadvantaged. When using facility-based data alone, one should keep in mind and explicitly acknowledge that these data may under-estimate the health problems and unmet needs in the overall population.

In every country, vast amounts of data are collected by health care facilities and never used. Some of the data collected are of questionable utility for any purpose, including but not limited to considerations of equity. Improving monitoring capabilities will require identifying and eliminating data elements that are not useful, to permit the collection and analysis of those that are. On the other hand, considerable amounts of collected but unused data are relevant to equity considerations. Some of these potentially useful data are neither used at the local level nor reported to the central levels at which data are traditionally aggregated and examined. A prime example of this is data on patients’ addresses, collected at most facilities for follow-up purposes. Such information could be of marked utility for monitoring equity as a microgeographic marker that could permit characterizing patients based on socioeconomic, social, and environmental characteristics of their communities. (Microgeographic markers of socioeconomic status are discussed in Chapter IV.A.; the use of area- and group-level characteristics in analysis is

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mentioned briefly under Step 5.)

Data from outreach programs are among the most potentially useful sources of facility-based data for equity purposes, particularly when outreach programs have been designed to target potentially under-served or especially vulnerable populations. Along with health care personnel involved in such outreach activities, teachers and environmental monitoring personnel often have extensive but unused qualitative knowledge of unmet population health needs. However, systematic approaches are needed to reduce the risks inherent in such data of bias or misleading information from non-representative samples. Strategies for collecting and analyzing such data should be coordinated across all social sectors (including social welfare, schools, and water/sanitation for example), both to avoid duplicative efforts and to ensure that each sector has the range of information it needs.

Facility-based data can be obtained from surveys of patients or health workers or from reviews of administrative or clinical data collected from a sample of clinical sites or users within sites. Sentinel clinical sites or sentinel providers have become a widely used method of facility-based monitoring. (Lobet, Stroobant, *et al.*, 1987; Kirsch, 1988; Woodall, 1988; Dunstone, Macharper, *et al.*, 1990; Bartelds, 1993; Sitas, Zwentstein, *et al.*, 1994) Sentinel site monitoring can permit more in-depth examination of issues at a limited number of typical sites and more timely data, as a supplement to information from statistically representative samples. Sentinel site surveillance can be useful for monitoring quality. It is rare that health care information systems cover the use of private providers, including traditional healers; in many countries, the private sector may account for a significant proportion of utilization, even by very poor people, and it would thus be ideal for information to cover private as well as public facilities.

Morbidity reports from clinical sites are subject to differential reporting of morbidity among different socioeconomic groups and differential reporting across sites, often leading to erroneous estimates of differences in disease incidence/prevalence across different socioeconomic groups. Reports of notifiable diseases are limited to disease cases that come into contact with services and furthermore to those cases in which the providers file reports. Some providers may be more likely to report particular conditions than others, or to more readily report conditions occurring in some groups than in others. For example, racial and class biases have been described in reporting sexually transmitted diseases, psychiatric conditions, and other conditions that carry a social stigma. In general, only those notifiable diseases covered by truly population-based surveillance systems should be considered as candidates for monitoring to assess equity.

The limitations as well as the strengths of selected population-based data sources recommended for consideration in monitoring equity are discussed in Chapter IV. B. As noted previously, Chapter IV. D. discusses how facility-based data might be used in a creative manner along with key sources of population-based data, to assess equity.

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**→ Step ④: Identify indicators.**

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Which specific indicators of health and its determinants would be most suitable to assess avoidable social gaps on the general issues of concern? Indicators must be selected in a process that includes the appropriate range of participants. Often, there is a range of possible choices of indicators, each of which could be meaningful with respect to a given policy concern; the choice of which indicator to study among the possible options must be guided by clear criteria. Ideally, multiple indicators should be examined to explore how one's conclusions about equity might vary using different indicators; only a very few would ultimately be presented to the public and busy policy-makers but the conclusions reached based on the limited number of indicators would be based on a more extensive process.

**□ Criteria for selecting indicators to monitor equity in health**

The table in Chapter III displays selected indicators, data sources, and comparisons that are recommended for consideration based on criteria summarized below; the table of indicators suggests promising possibilities to be explored but is intended to be neither exhaustive nor definitive. The options listed in the table were selected as examples based on the following criteria, which may be helpful in selecting indicators for policy-oriented monitoring of equity in health and its determinants in different national settings. Chapter IV discusses several major methodologic issues that arise in selecting indicators to assess equity in health and its determinants.

**□ Criteria for selecting indicators to monitor equity**

- The indicators must meet standard scientific and ethical criteria (validity, reliability, ethical and cultural acceptability). This requires, for example, that the data source(s) for the indicators are of acceptable quality. For any indicator under consideration, the quality of the data in a given source must be formally assessed. Precision will probably be less important than the extent and nature of bias in measurements. Local experts who know from experience the limitations of the data sources under consideration must be consulted.**

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- **Differences in the indicators between better- and worse-off groups should be relatively likely to reflect avoidable, unfair gaps in important conditions that could be narrowed through policy changes in any sector that influences health, not just health care.**
  - **Appropriately disaggregated data (disaggregated according to the social groups one wants to compare) on the indicators should be accessible for monitoring over time at the desired geographic level.**
  - **The indicators must occur frequently enough in the groups to be monitored to permit reliable estimates of differences between the groups. Monitoring rare conditions -- or even common conditions in small groups -- can result in misleading impressions of differences between groups or changes over time that reflect random fluctuations rather than real inequities.**
  - **The complexity of analysing, presenting, and interpreting information on the indicators should be considered in the light of the experience of the local analysts, decision-makers, and other key participants who must perform these functions on a routine basis, generally without outside technical support.**
  - **A range of indicators is needed to reflect important aspects of health and its major determinants, including indicators of:**

- *health status,*
- *major determinants of health apart from health care, and*
- *health care itself. Indicators of health care must reflect key aspects of health care, including:*

- *health care financing,*
- *allocation of health care resources,*
- *utilization of health services, and*
- *quality of health services.*

- **When a large number of indicators meet the above criteria, an additional criterion to set priorities among the options to be presented to non-technical audiences should be the extent to which the indicators are likely to be meaningful (i.e., to reflect important concerns) to the public and policy-makers.**

**□ Why focus on both health status and health care? And why include the determinants of health apart from health care?**

Equity in health status and in health care must be assessed separately. Many factors apart from health services are powerful-- and often the most powerful--determinants of health status. Widening gaps in health status may be one of the most sensitive indicators of problems with broad

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economic or social policy, to which responses from the health care sector alone may be neither effective nor efficient. Therefore, monitoring equity requires assessing not only inequities in health care but avoidable social inequalities in health status itself. Avoidable social disparities in health status indicate a need to reassess policies in many sectors in addition to health care.

**□ Indicators of health and its determinants recommended for consideration in policy-oriented monitoring of equity**

See the Table in Chapter III for further specification of indicators as well as comments on relevant data sources and comparisons that seem worth considering for policy-oriented monitoring of equity. The boxes below are included here only to provide an overview; they list only the general categories of indicators included in that Table.

**□ Selected indicators of health status recommended to consider for assessing equity**

- *Children's growth and nutritional status*, and particularly rates of stunting (low height-for-age) among children < 5 years old
- *Child (under 5) mortality* and, where possible, its components assessed separately: neonatal, postneonatal, and infant mortality, and mortality among children 1-4 years old
- *Life expectancy* at birth, or at age 5, or related measures (see Table and further comments in Chapter IV. C.)
- *Maternal mortality ratio* (requires relatively large population sizes; see Table and comments in Chapter IV. C.)
- *Rates of tobacco use as a major risk factor for important chronic non-communicable diseases*; also, if and only if reliable population-based data are available, measures of disability in general, and of uncontrolled hypertension or diabetes mellitus

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- Selected indicators of major determinants of health status (apart from health care) recommended to consider for assessing equity

Indicators in this category that are ideally measured at both the individual- and group- or area-levels include the following:

- *Safe water and sanitation*
- *Food supply*
- *Adequate housing*
- *Poverty (based on income, expenditures, or economic assets)*
- *Educational attainment*

The following indicator is only relevant when measured at the group- or area-level:

- *Income inequality in the society: the ratio of total income held by the wealthiest fifth of the population to the ratio held by the poorest fifth of the population*

- A key indicator for assessing equity in health care financing

- *The burden of payment for health care: the proportion of a household's total expenditures that go to pay for health care services.*

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**Indicators of health care resource allocation to consider for assessing equity**

- ***Public expenditures for health care:*** Per capita total public expenditures on health care including recurrent expenditures for personnel, supplies, equipment, and facilities. If possible, also private expenditures (separately) and total expenditures.
- ***Distribution of qualified health care personnel (in the public sector):*** The number of persons in the population divided by the full-time-equivalent health-care personnel in the public sector in different professional categories who are available to serve that population. This calculation should exclude unfilled posts and count part-time positions in a way that reflects actual activity levels. Alternatively, one may prefer to examine the per capita number of qualified personnel (in specified professional categories). If possible, also personnel in the private sector (separately) and total personnel.
- ***Distribution of health-care facilities at the primary, secondary, tertiary and quaternary levels (distinguishing each level).*** Information on budgetary allocations and on personnel may be easier to quantify adequately and hence more meaningful for assessing equity. At least public facilities; ideally, both public and private facilities separately, and a total.

**Selected indicators of the utilization and quality of health care that may be particularly suitable for assessing equity in health care**

- ***Immunization coverage of infants***
- **Reproductive health care coverage, including:**

- ***Antenatal care coverage***

- ***Safe delivery care coverage***
- ***Contraceptive prevalence rates***

- **Quality of primary care as reflected by the *availability of essential drugs*; some of the indicators of health care resource allocation include factors to reflect quality of primary, secondary, and tertiary care to some extent.**
- **Access to health care referral services as reflected by *appropriate representation of disadvantaged populations among the users of referral-level facilities*. *Appropriate representation would be at least proportional to the % of the total population constituted by the disadvantaged groups.***

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**→ Step ⑤: Describe current equity patterns and present the information as clearly and simply as possible for both lay and professional audiences.**

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What is the current health equity situation as reflected by the most recent information available? Current patterns of the selected indicators should be described among the social groups of concern in the most recent data available, examining both absolute levels and relative differences. That is to say, there should be assessments both of (a) how well each group is doing with respect to the selected indicators in absolute terms and (b) the magnitude of the gaps between groups. Conclusions about inequities may be quite different if information is available on only one of these two aspects. For example, a sizable gap in life expectancy between the poor and the non-poor could have different implications depending on each group's absolute ranking according to international standards: In one case, both the poor and non-poor might have relatively high life expectancies by international standards; in another case, life expectancy might be very low among the poor while the non-poor could be doing quite well by international standards. In both cases, the gaps would indicate inequities that needed to be addressed by policy, but the likelihoods of mobilizing political will for effective policy could be very different.

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**Describing patterns of social inequalities in health to assess equity and inequity**

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**□ Overview of a general analytic approach to assessing equity and inequity**

Other sections of this document, including the comparisons between social groups listed in the Table of Indicators, contain a range of material relevant to analytic methods. The technical material in this document focuses primarily on epidemiologic concerns and tools. But it should be clear from a glance at the range of issues involved in proceeding through the eight recommended steps (see Executive Summary and Chapter II) that a very wide range of disciplinary perspectives and tools are needed for policy-oriented monitoring of equity, including those of sociology, social psychology, anthropology, political science, economics, and demography, among others.

Key elements of the recommended analytic approach include the following, which apply both to this step (assessing current patterns) and the next step (assessing trends over time in the

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patterns):

- **Use disaggregated data rather than population averages.** It is essential to disaggregate information on relevant indicators of health and its determinants according to markers of greater and lesser social advantage.
- **Focus on social inequalities in health that are likely to be avoidable.** Comparisons among social groups should be made using indicators of health and its determinants that are most likely to reflect *avoidable* social inequalities when relevant comparisons are made using them, i.e., using indicators relatively likely to generate comparisons that reflect inequities, not merely avoidable disparities.
- **It is essential to assess absolute well-being as well as relative gaps, and to assess changes over time as well as current patterns;** see Chapter IV.D. on Quantifying differences between groups. It is necessary to examine how well each social group is doing in relation to its own past experience (i.e., to assess whether there has been absolute improvement, stability, or worsening) as well as the size of disparities between social groups in the most recent data. It also is essential to examine trends in the sizes of the disparities over time. Only examination of trends over time can indicate whether overall policy directions seem to be headed in the right direction or not; for example, one might not want to change policy courses in the face of large inequities that are rapidly diminishing in association with a recently implemented policy.
- **Consider changes in the size of the disadvantaged groups.** When assessing whether a situation is becoming more or less equitable over time, it is essential not only to examine how the worse-off groups are doing on a given health or health care indicator (in absolute terms and in relation to better-off groups) but also whether the absolute numbers and proportion of the population who are disadvantaged are increasing, staying the same, or decreasing. For example, if mortality was not improving, or was getting worse, among the lowest socioeconomic group of the population, but that group was becoming exceedingly small, one might draw different conclusions about whether policies were generally leading to more equity, than if one ignored information about the sizes of the different socioeconomic groups, including information on both the extent and severity of poverty.
- **Looking for equitable/inequitable patterns of health care resource allocation and utilization by examining potential need-resource “mis-matches”:** Equity requires resource allocation according to need rather than according to social advantage. Hence, a basic analytic approach to assessing equity requires using indicators to reflect as well as possible the extent of need for health care services among different population groups, and then using indicators to describe how resources are allocated and actually received

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(utilization and quality). It then requires asking whether there is an apparent mis-match between the observed levels of need and the observed levels of resource allocation and utilization/quality. Given how difficult it is to define and precisely measure “need” in general and need for health services in particular, qualitative methods (e.g., consensus methods relying on opinions of a range of stakeholders) are likely to be required to assess how equitable or inequitable a given pattern seems to be, even when quantitative methods also are available. Considerable work to develop equitable quantitative formulas for health care resource allocation has been done in the United Kingdom (West, 1981; Smith, Bartley, *et al.*, 1990; Carr-Hill, Sheldon, *et al.*, 1994) and elsewhere; there has been widespread agreement that this is a complex undertaking whose conceptual bases must be continually reassessed.

- Equity requires actively seeking out pockets of greater need and directing resources to favor those in greatest need.
- In general, one should assume that social groups who are exposed to more (or more severe) serious health risks or who have higher levels of ill health (or both) should be receiving higher levels of health care resource allocation, and should be utilizing services more than groups exposed to less risk or shown to be in better health. A deviation from the “apparently equitable” pattern of more services for poorer health or greater health risk should be considered evidence of likely inequity that requires examination. See comments on horizontal versus vertical equity in Chapter IV.D.
- Displaying information on health risks, health care resource allocation, and health care utilization on maps is in itself an important analytic tool to help identify pockets of greater need.
- In general, even when quantitative techniques are available to assess equity, it is essential that there be a thoughtful process of qualitative reflection on the implications of the observed differences over time and among groups.
- A useful analytic approach: Comparisons should be made between the socioeconomic, geographic, and other characteristics of users of referral facilities (described through exit interviews at a sample of facilities) and the corresponding characteristics of the intended catchment population (obtained through census data, inter-census estimates, or community surveys). Inequities would be suggested, for example, by seeing higher proportions of more advantaged groups among the users of referral facilities than in the catchment population, or by seeing lower proportions of rural people among the users of any facility, based on the proportion of the catchment population who are rural residents.

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➤ **Other analytic issues:** Chapter IV. D. contains additional discussion of selected analytic issues, including:

- ❑ **Quantifying differences between groups;**
- ❑ **Issues that arise in making comparisons among social groups defined according to domains of equity/inequity apart from socioeconomic status (e.g., geography, gender, ethnicity, *etc.*)**
- ❑ **Other selected analytic issues in assessing equity, including the use of composite indices to reflect equity, and assessing horizontal and vertical equity**

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### **Presenting the patterns clearly and simply for non-technical audiences**

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Researchers should explore patterns among the full range of indicators selected for study, carefully considering whether the conclusions appear to vary across indicators. However, only a few of the indicators that seem most meaningful should be selected for presentation to policy-makers and the public, based on the criteria discussed above under Step 4. As a 1981 WHO document on "Development of Indicators for Monitoring Progress towards Health for All by the Year 2000" (World Health Organization, 1981) states:

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**"It is particularly important to select a small number of indicators that have social and political punch in the sense that people and policy-makers will be incited to action by them."**

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Porter/Sandiford (Sandiford, 1996) stated that the "agenda" is what policy-makers are currently paying attention to, and at any one time attention can be paid to only a very few issues. A fundamental goal of policy-oriented monitoring is to put and keep important issues regarding equity on the action agenda for policy-makers and the public, and to ensure a mechanism for accountability. To accomplish this, a very limited number of concerns about equity must be selected that, while not exhaustive or comprehensive, are of sufficient importance in themselves and also are likely to reflect broader implications regarding equity. Castellanos (Castellanos, 1991) discussed the concept of "tracer" indicators to reduce the number of indicators and

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variables needed to describe a given situation.

Information should be displayed as simply and graphically as possible, so that it is clear and easily understood by decision-makers and the public. Mapping is often particularly useful. Limitations of the information should be noted clearly, in terms that are as non-technical as possible; for example, it should be noted if data on births or deaths have been recorded at the place where the births or deaths occurred rather than by residence of the mother (for the birth) or the deceased; as discussed above (under Step 3 on data sources, vital records), inferences could be quite different in the two cases.

**❑ A few recommendations about presenting information on patterns in social inequalities in health and its determinants**

❑ Consult people who have experience with making attractive, simple presentations for non-technical audiences. This expertise often will be found outside of the health field, for example in marketing in the private sector, or in "social marketing" in the public sector. Even without formal consultation, one can find examples of attractive, easy-to-read graphics in local newspapers and magazines; even though they generally deal with topics other than health issues, these examples can suggest similarly clear and attractive presentations of the equity-relevant material. For example, in its regular section on economic indicators in the region, the magazine *Asia Week* includes particularly good, clear, colourful graphics that are eye-catching and simple to read.

❑ When possible, mapping information can be particularly effective by suggesting where policy and programmatic responses should be directed. Mapping may also make numbers seem more real to the people who live or work or are responsible for programmes in a given geographic area.

❑ Bar charts are often an excellent way to demonstrate patterns at a point in time, drawing attention to comparisons among different subgroups. Line charts are particularly good for showing trends over time in gaps between different social groups.

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**➔ Step ⑥: Describe equity trends over time.**

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What are the trends over time in the indicators of health and its determinants among each

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group? Is each group doing better, worse, or staying about the same in relation to its own past circumstances? And how do the groups compare with each other? Are some groups experiencing more rapid improvement than others? Are gaps between groups widening, stagnating, or narrowing? Information on changes over time is crucial for assessing policy implications. If social inequalities observed in the most recent data are large but time trends show a considerable improvement over time, this could favor continuing the basic direction of recently implemented policies rather than making fundamental changes. If, on the other hand, gaps seem to be getting larger or stagnating over time, major changes in policy (or improvements in the implementation of existing policies) may be needed to narrow the gaps.

Information on time trends is also needed to assess how each subgroup is doing over time with respect to its own absolute levels of health or health care. Relative gaps may not be getting much smaller, but if marked improvement over time is seen for every social group, this also could suggest that adjustments rather than radical changes in policies are needed to maximize progress toward greater equity.

While the analytic issues discussed in the previous Step (regarding the assessment of current/recent patterns in social inequalities) also apply to the assessment of trends over time, assessing trends over time is more complicated than assessing cross-sectional patterns. A major challenge is that there are fewer data sources available to assess changes over time. Even when potential sources to describe trends can be identified, there are frequently problems due to a lack of comparability of data elements in a given data source at different points in time. For example, a survey that is repeated periodically may change, drop, or add particular questions. The meaning of a given data element also may change over time; for example, in certain countries a primary-school education may be associated with a lower relative socioeconomic status now than it was 10 or 20 years ago.

The general points regarding presenting information on patterns stated under Step 5 also apply to the presentation of information on time trends; time trends are, however, more complex to depict because of the added dimension of time. As noted under Step 5 above, line graphs can be particularly effective for displaying information on trends over time (while bar charts are good for making comparisons at a given point/period of time). Three-dimensional graphics can present a lot of information, but may be difficult for non-technical audiences -- including even busy professionals -- to easily read and comprehend.

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**→ Step 7: Generate a process of considering the policy implications of the patterns and trends.**

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### **Include key participants.**

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The policy implications of the observed patterns and trends must be considered with an adequate range of input. Technical experts in the relevant issues will certainly be needed. However, other essential sources of input for interpreting the policy implications of findings include representatives of workers and decision-makers from all the relevant sectors, including key private as well as public sector agencies and representatives of civil society, including non-governmental organizations and organized community groups (e.g., labor, women's groups, advocates for other disadvantaged populations). It is crucial that this step involve the key constituencies who must be mobilized for policy implementation and to create and sustain political will. The likely policy implications of the patterns and trends must be considered with respect not only to the health sector but to all the other sectors that have major influences on health.

For each of the patterns and trends in social disparities in the selected indicators of health and its determinants, two questions need to be asked:

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- **Is the situation reflected by the patterns and trends as equitable as it could be?**
  - **What could be done to reduce the inequities, in the short-medium-, and long-term?**
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The first question must be addressed before proceeding to the second, even when researchers consider that a given pattern or trend in social inequalities represents inequity. Although the indicators and comparisons should have been selected to reflect inequities, not just unavoidable inequalities, people in different interest groups are likely to disagree about the degree to which a given pattern or trend is truly unfair and avoidable. They also may disagree about which particular inequities deserve most urgent attention and/or about the most promising directions for policies to remedy a given recognized inequity. This is the step in which conflict is most likely, because groups benefiting most from the current situation are likely to resist efforts at redistribution favoring currently disadvantaged groups.

This step is one where political considerations are likely to outweigh purely scientific concerns. This should be anticipated, and scientific evidence should be presented most effectively to reach key constituencies and the interests of the disadvantaged, considering expected resistance from representatives of the social groups who benefit most from the status

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quo. Effective and clear presentation should not be confused with misleading manipulation of the data for advocacy purposes; for example, the scales used in graphic presentation are often manipulated to exaggerate a difference, or limitations of data revealing inequities are often under-stated, creating the impression that the evidence is stronger (or weaker) than it really is. The responsibility of a researcher is always to seek the truth and represent it as accurately as possible. A researcher's ethical commitment to social justice should be reflected by the decision to apply his or her efforts to seeking evidence that could inform policies to achieve greater equity; the evidence must be scientifically sound and valid.

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**→ Step ③: Develop and set in motion a strategic plan for implementation, monitoring, and research, considering political as well as technical obstacles.**

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An action plan with clear, measurable targets for periodic monitoring should be developed, including a strategic research agenda and plans to improve existing data sources for better information to guide policy on a short-, medium-, and long-term basis. The action plan must take into account the extent of political will to achieve greater equity, and must be based on realistic strategies to overcome political as well as technical obstacles. The plan should be based on a thorough consideration of past efforts and why they succeeded or failed.

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### **Setting equity targets**

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An important element of any implementation strategy involves setting clear, measurable equity targets on which there is sufficient consensus, and setting a schedule for assessing progress toward the targets and re-assessing policy accordingly. An equity target should specify a concrete, measurable goal for reducing avoidable, unfair gaps between groups<sup>1</sup>. Equity targets are different from overall targets, which only specify goals measured in terms of averages that mix all groups together.

Examples of overall targets (general targets that do not address equity) include:

- By the year 2010, reduce child mortality by 25% (or by a given number of deaths).

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<sup>1</sup> For example: different socioeconomic, gender, ethnic, or geographic groups.

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- By 2010, increase life expectancy at birth (or at age five) by 2 years.
  - By 2005, increase the immunization rate of one-year-olds by 20%.
  - By 2005, reduce tobacco use by 25%.

By contrast, the following are examples of equity targets, each of which has different advantages and disadvantages:<sup>2</sup>

- By 2010, reduce the child mortality rate by 25% overall (or by a given number of deaths) and reduce the gap between the worse- (or worst-off) and the better- (or best-off) groups by at least 25% (or by a given number of deaths).
- By 2010, increase life expectancy at birth (or at age five) by at least 2 years overall and increase it by 5 years among the worse-/worst-off groups.
- By 2005, increase the immunization rate of one-year-olds by at least 20% overall and increase it by at least 30% among the worse/worst-off groups.
- By 2005, decrease tobacco use by 25% overall and decrease it by at least 50% among the worse-/worst-off groups.

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## **Develop a policy-relevant research agenda**

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Another essential element of a strategic plan is the development of a research agenda that will be most useful in informing subsequent decisions to continue, discontinue, or modify the policies put in place now. Strategic research will focus on how to develop the most effective and efficient approaches not only to formulating and implementing equitable policies but also the best approaches for assessing equity in health and its determinants; both explanatory and methodologic research are needed. Efforts should be made to identify the most important questions that will require explanatory research to develop effective and efficient interventions to improve equity. Research also is needed to guide efforts to improve routine data sources to make it possible to conduct better routine monitoring in the future. Explanatory research cannot be expected to be as timely as monitoring.

A number of issues have been mentioned throughout this document as deserving high

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<sup>2</sup> *The first example has the advantage of being clear about reducing the gap and may be preferred by those who believe it is important to look at relative disparities in addition to meeting an absolute minimum standard. The other examples may be somewhat simpler to visualize, and may be preferred where consensus on achieving a minimum standard for all is stronger than on reducing relative disparities. In each case it should be made clear that the goals are both improvement for everyone and faster improvement for those who have been worse-off, to permit them to catch up.*

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priority on a policy-relevant research agenda concerning equity. A few examples include:

- Research assessing the equity consequences of different interventions, providing assessments of which interventions appear most effective and efficient in achieving greater equity
- Research to guide methodologies that can be used in ongoing monitoring as well as in more complex explanatory research, e.g.:
  - Development and validation of appropriate measures of socioeconomic status at the individual and group levels, including measures that could be introduced into routine data systems
  - Development and validation of formulae reflecting “need,” to guide equitable allocation of health care resources among different social groups
  - Development and validation of a range of measures reflecting social characteristics of the communities in which people live and work that could have an important influence on social inequalities in health.

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### **Improve routine data sources to have better information to guide policy in the future**

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Recommended improvements in existing data sources that are needed in most countries (of any income level) for better monitoring of equity include the following:

- **Improve vital registration (birth and death records).**
  - Take steps to make reporting more complete. For example, recruit traditional birth attendants to help register births and infant deaths and recruit community leaders to ensure registration of all deaths.
  - Report births and deaths by the location of a person's residence, not by the location of the facility where the birth or death occurred.
  - Add socioeconomic information, e.g., education of the mother (birth or child death) or the deceased (adult death).
  - Set improvements in birth and death registration as one of the highest priorities for developing an ongoing routine capacity to monitor equity in health.
- **Improve the usefulness and the utilization of existing household surveys that other agencies already finance and conduct.**
  - Add essential elements (e.g., socioeconomic information and/or information on one or more key indicators of health or health care).
  - Improve timeliness.
  - Increase domestic input into and use of the surveys; national policy-makers and

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researchers should be involved in adapting existing donor-supported surveys to meet national needs. Ensure that national researchers (in public and private agencies) have access to and training in how to use the raw data.

- Explore opportunities to consolidate existing surveys, recognizing that resultant cost savings could make it possible to expand sample sizes.

– **Improve routine community-based monitoring systems: Make them truly community-based, not just facility-based.**

- Make sure that routine community-based monitoring systems include a sample of people outside health care facilities (e.g., from outreach data in neighbourhoods or public places such as markets) to ensure that results are representative of the population, including people using the health care facilities less often/not at all.

– **Make more use of rapid assessment methods and key informants as sources of routine monitoring, especially at the local level.**

- Periodic exit interviews at health-care facilities are particularly useful (see Step 3 on data sources, and Step 5 on describing equity patterns, above).
- Knowledgeable key informants may be essential to supplement routine statistics (e.g., reporting births and deaths) and should be tapped as a source of information to understand a situation, *even* when extensive and reliable quantitative data are available.

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## Chapter III. TABLES OF SELECTED INDICATORS, DATA SOURCES, AND COMPARISONS

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### Chapter IV: Selected technical issues

This chapter includes material discussing several technical issues that often arise in undertaking one or more of the steps suggested as part of an approach to monitoring equity:

- IV. A. Classifying people into socioeconomic and geographic groups
- IV. B. Data sources
- IV. C. Methodologic considerations in selecting indicators
- IV. D. Selected analytic issues: additional comments

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#### IV. A. Classifying people into socioeconomic and geographic groups to assess equity

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Because socioeconomic and geographic comparisons are so fundamental to assessing equity in virtually every setting, the following text presents some options for classifying people into different socioeconomic and geographic groups for that purpose. The term “socioeconomic” is used here specifically to refer to the possession of or access to control over economic resources. By contrast, the term “social” is used in a more general sense to encompass not only

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socioeconomic factors but any factor that differentiates subgroups of people from other subgroups, e.g., the geographic areas where they reside, being female versus male, being a member of a given ethnic or religious group, or being in a certain age category.

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**Classifying people into socioeconomic groups using different measures:**

- income, expenditures, or consumption**
  - wealth or assets**
  - education**
  - occupation**
  - microgeographic markers**
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Five broad categories of socioeconomic factors may be particularly helpful for categorizing groups to monitor equity in health and health care in low- and middle-income countries:  **measures of household income, expenditures, or consumption;**  **measures of economic assets;**  **educational attainment of adults;**  **occupational class;** and  **microgeographic markers.** All of these factors can be used to characterize the socioeconomic status either of (a) an individual person or household or (b) the community or geographic area/territory where that person/household lives; both individual- and community- (also referred to as group- or area-) -level factors are important to consider. An example of an individual- or household-level socioeconomic factor would be the income level of a particular person or that person's household expressed in relation to a specified poverty level; a group- or area-level factor would be the proportion of the households in that person's neighborhood who have incomes above or below the poverty level. Microgeographic markers (discussed below) provide a way to characterize an individual, household, or group socioeconomically according to features of the relatively small and socioeconomically homogeneous geographic territory where that individual/household/group resides.

**Measures of income, expenditures, or consumption as socioeconomic measures**

Expenditure levels are often used to characterize people socioeconomically because income data may not be suitable measures of socioeconomic status in subsistence or barter economies, or in economies where a considerable proportion of the population is employed in the informal sector. Income data may be available and appropriate in some countries, however, especially middle-income countries that are relatively industrialized. In general, measures of income or expenditures should be adjusted for total family size, i.e., the number of persons -- including children -- who are supported by that income or those expenditures. Excluding children

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could tend to underestimate inequity, especially since poorer families tend to have more children. People could be classified socioeconomically using information on income, expenditures, or consumption by:

- dividing them into subgroups of similar size according to their relative income or expenditure levels; or
- categorizing them according to specified “absolute” standards for subsistence or poverty.

**One way to classify people into socioeconomic groups: dividing them into subgroups of similar size according to their relative income or expenditure levels**

People could be classified into socioeconomic groups by dividing the population into 5 groups (quintiles) with equal numbers of households in each group, according to their total average monthly income or expenditures (whichever is available or considered more reliable in your setting; in many settings information on expenditures is more available and/or reliable than information on income). Quintile 1 (Q1) would contain the households whose income/expenditures put them in the bottom 20% of the population. Quintile 2 (Q2) would contain the households in the next lowest 20% of the population, and so on up to Quintile 5 (Q5), which would contain the richest 20%.

One also could use quartiles (fourths) or terciles (thirds), instead of quintiles. Middle-income countries are more likely to need at least four or five groups to describe the different socioeconomic groups in their settings, while fewer categories may be adequate in low-income countries. The number of categories also will depend on the precision of the data and the size of the population: Fewer groups should be used when the measures are imprecise and/or when each group includes fewer people.

**Another way to categorize groups of people socioeconomically: grouping them according to specified “absolute” subsistence standards based on income, expenditures, or consumption**

In some countries, it may be preferable to classify people according to specified absolute standards of income, expenditures, or food/caloric consumption required for subsistence, such as poverty lines established by national welfare agencies. Such standards often reflect food security, because along with other factors they often are based on ability to purchase at least a subsistence level of food. For example, a poverty assessment study conducted in Zimbabwe

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during 1995 and discussed in a national report on equity in health (Chandiwana, Moyo, *et al.*, 1997) classified people into three groups based on household expenditures:

- ✓ The **very poor** had expenditures that fell below the minimum level to purchase a basic basket of food considered necessary for subsistence.
- ✓ The people who were **poor** could purchase the basic food basket but their expenditures would not cover basic non-food items (shelter, clothing, transport, health care) considered essential for a decent minimum standard of living.
- ✓ The **non-poor** had expenditures that covered more than the minimum food and non-food standards.

### **□ Measures of household wealth or economic assets as socioeconomic measures**

In many situations information will not be available on either income or expenditures, but information describing the wealth or economic assets possessed by households could be identified in an existing data source or collected relatively easily. Furthermore, in some respects, wealth or economic assets can be better measures than income or expenditures, because they reflect the cumulative effects of a household's economic circumstances over time, whereas income and expenditures may fluctuate.

A range of measures of current economic assets, such as property or livestock holdings, instead of income or expenditures, also may be useful to categorize people into a few very broad socioeconomic groups. Socioeconomic status is generally highly correlated with living conditions such as (a) conditions of the water supply, sanitary facilities, and presence of electricity within a household; (b) type of housing (dirt versus finished floor; construction materials of walls and roof); and (c) measures of crowding (persons per bedroom). Hence measures of such living conditions may be used to reflect socioeconomic status in terms of broad groups (e.g., people whose living conditions are inadequate, intermediate, and adequate for health according to specified criteria). Other potential measures of assets that may be used to reflect socioeconomic status include: ownership of a home and some measure of the size or number of rooms and/or the materials of construction; ownership of land and some gross measure of the size/value of the holdings; or ownership of a range of possessions such as bicycles, carts, radios, or refrigerators.

The socioeconomic implications of having or lacking a given asset often vary considerably in different settings within the same country: For example, fairly well-off households in some rural areas may lack certain items that would only be absent in the poorest of urban households. Hence, it is particularly important to base any socioeconomic classification system that relies on economic assets on the results of systematic validation studies (defined above) carried out in a representative sample of the kinds of settings where the measures will be

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used.

Individual-level measures based on economic assets could be stated in terms of (a) whether a given household possesses certain economic assets (e.g., radio, bicycle, electricity) or (b) where the household fell on a scale reflecting the level of amenities. For example, households could be ranked according to the number of coconut trees or cattle each owns, with cut-offs denoting possession of the minimum number of trees or cattle needed to meet bare subsistence needs or to cover subsistence needs and also be able to send children to school. A group-level measure in this category could be stated as the percentage of households in a given community or territory that possess the minimum (or other specified) level of assets, or in terms of the average level of assets in the community. Since average levels in a community can hide large discrepancies, it is generally recommended first to consider using group-level indicators framed in terms of the proportion of people or households in a community who fall above or below a given specified standard or have a specified characteristic.

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❑ Measures of *wealth or material assets* of a household that could be used to classify people into socioeconomic groups include:

- size (e.g., hectares) of land-holdings
- number of livestock owned

- number of trees or plants that produce a marketable commodity, e.g., coconut trees
- ownership of commodities such as radios, televisions, refrigerators, carts, bicycles, motorcycles, or automobiles; commodities may correlate differently with socioeconomic status in rural versus urban settings.

- type of fuel used for cooking
- construction materials of the dwelling: floor, roof, walls
- number of household members per number of rooms in the dwelling
- presence of electricity

❑ The particular way that measures of assets (and any other kinds of measures) are used to group people into broad socioeconomic categories needs to be validated (i.e., compared with the use of a measure whose validity is better established) for use in the setting where it is to be applied; experienced researchers (e.g., demographers, sociologists, economists, and experts on poverty) in one's own country and region should be consulted.

### ❑ Education as a socioeconomic measure

Education, measured in terms of the level of education completed or the number of completed years of formal schooling, is highly associated with access to economic resources in most settings and often is used as a proxy for income specifically or socioeconomic status in general. Education may reflect long-term overall assets, or cumulative economic resources and general access to obtaining more resources, to a greater extent than income at a given point in time. Like occupational class, education reflects additional dimensions of social position or prestige in a society, in addition to strictly economic resources.

It is often easier to elicit information on years of completed education than to obtain information on income, expenditures, assets, or occupational class. For this reason, educational level is highly recommended in general as a proxy for socioeconomic status, with the caveat that no single measure is likely to be adequate on its own as the basis for categorizing groups according to their level of social privilege. It should be noted that the socioeconomic benefits associated with a given level of completed schooling are likely to vary between countries, and also may vary considerably within countries, typically according to gender or ethnic group or over time.

An example of an individual-level socioeconomic measure based on education could be the number of years of formal schooling completed by an adult head of a household, or whether the adult head-of-household had completed primary, secondary, or post-secondary schooling. The

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relevant groupings need to be determined by knowledge of the distribution of levels of schooling as well as their economic correlates in a given country; these relationships need to be periodically assessed as they are likely to change over time. A group-level socioeconomic measure based on education could be the percentage of adults in a group/territory who had primary, secondary, or higher levels of education; or whether more than a specified proportion (e.g., 50%) of adults in a given group/territory had completed a given level of schooling.

❑ **Another way to categorize people into socioeconomic groups:  
using *educational attainment* (schooling)**

- ❑ ***Education* is highly associated with socioeconomic status and position because it generally confers access to greater income as well as power (in virtue of being able to obtain knowledge, acquire skills, and express oneself in a manner more likely to be heard); education also often confers social prestige. The criteria used to categorize people according to education will vary with the setting. For example, in a country with generally low educational levels, one might want to compare people with no formal schooling, those with primary schooling only, and those with secondary schooling or above. In a country where more people attain higher levels of schooling, or where there are very few people with very low levels of schooling, one may need more categories or different categories.**

❑ **Occupational class as a socioeconomic measure**

**Occupational classifications** have been used widely in European countries as measures of socioeconomic status or position, and have been considered valuable because they reflect important dimensions of social class or socioeconomic position, including prestige, authority, and autonomy, in addition to being associated with differences in income. It is important to recognize, however, that many occupational classifications may not capture important socioeconomic differences in the absence of additional information. For example, a rich land-owner, a peasant barely eking out subsistence, and a migrant farm laborer each would be classified as farmers; a clerical worker earning minimum wage and a well-paid high-level secretary with administrative duties as well as considerable decision latitude would both be classified as clerical workers; a street vendor selling home-made candies and a salesperson employed by a large shop would be sales personnel; and engineers and managers as well as those who perform heavy labor in the mines would be classified as workers in the mining sector. In addition, classifications based on supervisory functions may be less useful markers of socioeconomic differences among people in small enterprises than among those employed in settings with large numbers of personnel.

However, broad classifications that distinguish manual versus non-manual workers, or white collar or professional workers from all others, are likely to be helpful markers of gross socioeconomic distinctions for the purposes of research on social disparities in health. (United Nations, 1985) Furthermore, while occupational class may leave out some important information, it can also be said of all the other options presented above for measuring socioeconomic status that

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each reveals only a limited amount of information when used alone without the benefit of additional information from other measures. Ideally, one would use two or more different socioeconomic measures to assess equity, comparing the conclusions reached when using each. High priority should be given to research supporting the development of occupational and other classifications that are valid measures of socioeconomic differences in economically diverse countries.

### □ **Microgeographic markers to reflect socioeconomic differences**

**Microgeographic markers** are among the most useful proxy measures of socioeconomic status. As with other useful proxy measures, it is essential to keep in mind the limitations of microgeographic markers and to compensate for their limitations by using other measures as well. Microgeographic areas are small geographic territories (generally sub-district-level) whose characteristics are often used to describe the people who live or work in them. A microgeographic marker is a variable (e.g., a unique numeric code assigned to a neighborhood as in census data, or a postal code) that identifies a microgeographic area. In order to use a microgeographic marker as a socioeconomic measure, the area/territory represented must be small enough so that there is a high degree of socioeconomic homogeneity among households within the area.

Although even large geographic distinctions, such as urban versus rural residence, have in the past been useful markers of socioeconomic differences within industrialized as well as developing countries, there is now considerable socioeconomic heterogeneity within such geographic areas, even in developing countries. Most cities in developing countries are associated with large peri-urban areas of poverty as well as areas of affluence. There also may be considerable variation in the socioeconomic levels of people residing in rural areas (e.g., owners of large farms versus migrant workers/tenant farmers). When considering sufficiently small areas (i.e., microgeographic distinctions), however, residential segregation frequently exists along class lines. Furthermore, microgeographic markers often correlate well with environmental characteristics that influence social privilege, for example, location in precarious environmental conditions or in or near areas where physical features such as mountains, deserts, or canyons act as obstacles to access.

Useful microgeographic markers denoting residential location are often readily accessible in census/other household survey and vital statistics data (as well as facility-based data), but have been insufficiently used. Sometimes relatively homogeneous communities can be readily identified by name (e.g., by name of village or town, or name of neighborhood within village or urban area). Postal codes can be useful but often include areas too heterogeneous to characterize socioeconomically. "Block groups" within "census tracts" have been used to characterize socioeconomic status in the United States.(Krieger, 1992) Geographic (including microgeographic) markers may have limited utility when areas defined as administrative units do not correspond to "meaningful social areas."(Illsley, 1990) Improving the availability of data for monitoring equity may require improving the correspondence of administrative units to meaningful units for policy and planning. There should be periodic re-assessment of the nature and extent of changes in the degree of homogeneity of communities whose socioeconomic status is described by community-

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level markers.

Microgeographic markers of socioeconomic differences are by definition ecologic or community-level measures. In recognition of the lack of precision, the number of distinct social categories should be kept relatively small. The fact that microgeographic markers are ecologic measures, describing group- or community-level versus individual-level differences, is simultaneously a limitation and a considerable strength. The limitation is the potential for misclassifying an individual according to predominant characteristics in the small area where s/he resides. The advantage is that microgeographic markers take into consideration the powerful effects of the characteristics of the area in which one lives. For example, there is considerable evidence that a poor individual or household is at considerably lower risk of adverse health outcomes if that individual/household resides within a neighborhood that is predominantly non-poor. Because individual and group-level characteristics interact with each other in powerful ways to influence health, both are important to consider.

❑ **A microgeographic marker of socioeconomic status provides a way to characterize a household's socioeconomic status according to the socioeconomic characteristics of the small geographic area (typically, a neighborhood or village) in which the household is located. Some households may get misclassified this way because they are not typical of their small area. To minimize misclassification, microgeographic areas must be chosen to reflect clusters of households that are relatively homogeneous from a socioeconomic point of view.**

❑ **Other social characteristics that have been used as markers of socioeconomic differences**

Other social characteristics or factors that are correlated with socioeconomic status have been used to categorize groups according to socioeconomic differences. The factors listed below are all very important social factors that are highly relevant to equity considerations in their own right, but they may not be as useful to classify people into socioeconomic groups as the kinds of measures noted above.

❑ **Economic activity.** Distinctions between those who are employed, unemployed, and underemployed may be difficult to make in settings with substantial informal economic activity.(United Nations, 1985) It is important to include unemployed or unpaid workers in any representation of population health; currently employed and salaried persons may be healthier than other working-age persons.(Dahl, 1993)

❑ **Urban versus rural residence.** There are very few countries in the world that do not by now have large populations of poor people in urban areas. While wealth historically has tended to be concentrated in urban areas in most countries, some of the worst poverty now can be found in

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urban and peri-urban slums. While less striking, there also is considerable socioeconomic heterogeneity among rural populations in many countries. Because of this heterogeneity, urban versus rural residence is not appropriate for use as a measure of socioeconomic difference, although it remains a very important distinction in its own right, for example, as a reflection of geographic obstacles to access to health services. [See text on geographic classification, below.]

❑ **Health insurance coverage.** In some countries the presence or absence of health insurance coverage and the type of coverage (public, private, and sub-types) have been used as proxies for socioeconomic status. One needs to keep in mind, however, that there often is considerable socioeconomic heterogeneity among people with public or private health insurance. For example, in some countries both high-level professionals and minimum-wage blue-collar workers within an enterprise may have the same type of public health insurance. In certain countries, having public insurance in general or public insurance of a particular type may be a valid marker of socioeconomic status, but this should be carefully confirmed before relying on it. Like the distinction between urban and rural residence, health insurance generally has limited utility as a marker of socioeconomic status, but is an important factor in its own right as a marker of financial access to health care.

❑ **Marital status** among adult women with children has been used at times as a socioeconomic marker in industrialized countries. There is ample evidence that female-headed households are more likely to be poor (and more extremely poor) in developing countries as well as industrialized countries; the strength of this association appears to be changing in some industrialized countries, however, where there are growing proportions of unmarried women with children who are doing well socioeconomically. Marital status is an important marker of family structure and can also reflect social support; both of these factors could interact with economic resources to determine levels of social advantage or disadvantage. Hence, marital status could be a valuable measure of overall social disadvantage, but caution should be exercised when using it as a proxy for socioeconomic status.

❑ **Ethnicity** is used here very broadly to refer to racial, ethnic, tribal, or religious distinctions. Socioeconomic resources or position often vary considerably between different ethnic groups, but variation within ethnic groups in a given country is generally so significant that ethnic variations generally should be considered in addition to, not as a substitute for, socioeconomic variations. Participants at a recent WHO-supported meeting in Nyanga, Zimbabwe, concluded that racial/ethnic differences are no longer a valid marker of socioeconomic differences in Zimbabwe, although they were around 1980 at the time of Independence. Although routine public health statistics in the United States have for a long time noted racial/ethnic distinctions, standard health statistical reports have not routinely included measures of socioeconomic status. Without information on socioeconomic status, inappropriate inferences are often made about the nature of apparent racial/ethnic differences in health and health care. When this happens, misguided strategies may be suggested to address the problems, with a potential for “victim-blaming.”

❑ **Complex socioeconomic indices:** Considering the array of measures that reflect different aspects of socioeconomic status, position, and privilege, some authors have

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recommended the use of complex socioeconomic indices taking multiple measures (e.g., education, income, assets, and/or occupational class) into account simultaneously. [See Cortinovic (Cortinovic, *et al.*, 1993) for an example of an attempt at developing a generalizable socioeconomic index for use in a developing country, critiqued by Carr-Hill (Carr-Hill, 1993) as excessively complex.] The assumptions underlying the construction of complex socioeconomic indices are often subject to considerable controversy; furthermore, complex multifactorial indices are generally unwieldy to use and confusing to present to the public and policy-makers. Our recommendation is that, whenever possible, efforts should be made to select two or three relatively simple measures that broadly reflect socioeconomic status, and separate analyses should be conducted using each of these simple measures to see if the conclusions are consistent. While validation is important when using any measure, when multiple measures are combined into a complex index it is particularly important to perform extensive validation if this has not been conducted previously, and to perform periodic re-assessments of validity.

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### **people into geographic groups**

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Geographic classification is an essential tool for equitable policy and planning. With respect to monitoring equity, the point of geographic classification is to identify pockets of unmet need or relative disadvantage and to aid in assessing whether the resources allocated to a given geographic area appear to match the level of need of the population living in that area when compared with allocation and need in other areas. Ideally, differential allocation of resources according to privilege rather than need should be considered within the smallest possible geographic units. The practical limitations will be the availability of sources of data that can be disaggregated at the desired geographic level and concerns about statistical power (i.e., questions about whether the numbers in small areas are sufficient to yield stable estimates for comparisons).

Geographic distinctions within countries that are often relevant for policy-oriented monitoring of equity in health and health care include: province/region/department within a country (generally referred to here as province); district within a province; and sub-district-level distinctions (e.g., city, town, village or neighborhood within a district). In some countries, e.g., Zimbabwe, the largest cities are not contained within any province but are administratively separate; in such cases, cities must be treated essentially as provinces. Useful geographic distinctions generally should correspond to both recognized territorial boundaries and functioning administrative units. Clearly, the larger the territory, the less likely is it that the territory will be homogeneous with respect to key characteristics of the environment, population, or political process. However, in some cases, geographic groupings may be relevant that do not fit clearly drawn territorial or political boundaries. For example, in the report on equity in health in Zimbabwe mentioned earlier, (Chandiwana, Moyo, *et al.*, 1997) certain comparisons were made among communal lands, areas with large-scale commercial farms, areas with small-scale commercial farms and resettlement communities, and all urban areas because these groupings were known to correspond to differences in social advantage likely to have important health consequences.

An article by Akhtar and Izhar on "the spatial distribution of health resources within countries and communities: some examples from India and Zambia" (Akhtar and Izhar, 1986) gives excellent examples of mapping the distribution of health care resources to guide policy and planning. In Sri Lanka, a team from the Ministry of Health and a private non-profit research institute looked at the geographic distribution of indicators of need, including poverty, education, sanitation, and health status measures such as infant mortality, between provinces and between districts within provinces. They then similarly examined the distribution of resources in the health-care sector, including, for example, the distribution of different types of personnel. Without relying on computers, they were able to display the information on maps in a simple and clear way that supported discussion of the policy implications with decision-makers and representatives of civil society. Following is an example illustrating their approach.

Ideally, geographic categories should correspond to political entities that are relevant to resource allocation and political/social action. A widespread problem in trying to make geographic comparisons is the lack of consistency across different sectors in how geographic boundaries are set. For example, sometimes a health center's catchment area is defined without considering the

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pre-existing administrative boundaries affecting the collection of routine data on population characteristics, or without considering political structures that must be involved to address problems with, for example, water, garbage, transportation, working conditions, schools, or other factors with powerful influences on health status and health care use. While urban/rural distinctions are of great general importance for health planning, they often do not correspond to well defined political constituencies; i.e., rural areas often include areas that are part of more than one province (or district). On the other hand, urban/rural distinctions, especially within a given province or district, may indicate occupational or environmental risks that must be considered in equitable decision-making. For example, in Zimbabwe, virtually all residents of certain rural areas within a given province are workers on so-called commercial (i.e., privately owned) farms. These commercial farm workers are at particular risk not only because of potential environmental exposures (e.g., pesticides), but also because large areas owned by commercial farmers generally lack public service facilities such as schools or health care facilities.

- ❑ **Geographic classification – with the information presented visually on maps as well as in tables – is an essential tool for equitable policy and planning. Geographic classification permits the identification of pockets of unmet need.**
- ❑ **Computer software is widely available to display information on health status and health care graphically on maps in ways very helpful for assessing equity. The use of such software is often referred to as Geographic Information Systems. While this is an extremely useful tool, the software is only as useful as the information available to enter into it. Information on Geographic Information Systems is available from “HealthMap”, the WHO/UNICEF Joint Programme on Data Management and Mapping for Public Health, by contacting K. O’Neill or J-P Meert via mail (WHO, 20 Avenue Appia, 1211 Geneva 27, Switzerland) or by e-mail: [oneillk@who.ch](mailto:oneillk@who.ch)**

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## IV. B. Data sources to assess equity

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### Existing sources of data

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The following existing sources of data are often particularly useful for monitoring equity:  **vital registration data** (birth and death records);  **census data**;  **large population-based household surveys** conducted for other purposes, e.g.  **Demographic and Health Surveys** (DHS) and  **Living Standards Measurement Study surveys** (LSMS); and  **community-based monitoring systems assessing children's nutritional status and immunization coverage**.

#### **Vital registration data (birth and death records)**

**Vital records: a vital source of information on equity.** It is very difficult to develop an ongoing system for monitoring equity in health and health care in the absence of reliable vital records. Birth and death records are so potentially valuable for monitoring equity in health that high priority should be given to improving their quality, completeness, accessibility, and timeliness. Improvements in the quality and completeness of vital records could make many expensive primary data collection efforts unnecessary, thus making the investment in improving vital records most efficient in the medium- and long-term.

**The problem of under-reporting births and deaths, particularly among disadvantaged groups.** The completeness of vital registration is particularly critical for assessing equity; births and deaths among members of marginalized groups are most likely to be under-reported. In many countries, vital records are kept by the same unit that conducts the census, and techniques have been developed to correct to some extent for under-reporting in vital statistics. (Kralay and Norris, 1978; Palloni, 1979; Bicego, Augustin, *et al.*, 1989; Woelk, Arrow, *et al.*, 1993)

**Information included.** Birth certificates in most countries include information on the site of delivery. In some countries, birth certificates also include measures describing the receipt of antenatal care, and a mother's (and father's) educational attainment and home addresses; information on education can be used as a proxy for socioeconomic status. In countries where these items are not included in the birth certificate, serious consideration should be given to the possibility of including them in the future.

Inclusion in vital records of a home address would permit classification of a mother's socioeconomic status (see microgeographic markers under Step 1) as well as identification of

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geographic pockets of poor birth outcomes or inadequate receipt of prenatal care. Without knowing where the mother resides, one can only attribute birth outcomes as recorded in birth records to the geographic area where babies were delivered, which is often an urban hospital, even for rural residents. These data provide inadequate information to programs designed to address factors leading to poor birth outcomes, which must be targeted where mothers and their families reside. For example, researchers in Sri Lanka who wanted to assess equity by examining vital records on infant mortality found much higher rates of infant mortality in urban areas than in rural areas, where health conditions were known to be worse. Although they suspected strongly that the data reflected the fact that high-risk births are generally referred to urban centers where there are specialized facilities, without information on residence the investigators were unable to localize the avoidable risk factors (e.g., unsafe water or sanitation, inadequate nutrition, or inadequate antenatal care) likely to have contributed to many of the infant deaths or to target preventive programs.

❑ **Reporting births and deaths by residence versus occurrence.** The table of indicators, data sources, and comparisons (Chapter III) distinguishes between vital events reported “by occurrence,” i.e., according to where the birth or death occurred (often a health care facility), and those events recorded “by residence,” i.e., according to where the people reside (the mother in the case of a birth, and the deceased person in the case of a death). In some countries, information on residence is in fact recorded at the time of a birth or death but is not included in the data reported for aggregation at more central levels; typically, the data are aggregated by occurrence, and information on residence will no longer be available to users of the data.

### ❑ **Census data**

Census data contain a wide range of useful information for assessing equity, including multiple measures of socioeconomic status reflecting income and/or expenditures, assets, education, occupation, and living conditions. Census data frequently include information on ethnicity as well as basic demographic factors and family structure. Decennial census data are especially useful in the years surrounding a census year; in many countries inter-census estimates are made that can be used when sufficient time has passed so that the most recent full census may be out of date. While improvements in the quality, accessibility, and timeliness of census data are needed in most countries, this investment is likely to be worthwhile. It is very difficult to develop an adequate routine system for monitoring equity in the absence of a reliable census, which at the very least provides denominator data for the population and its subgroups.

### ❑ **Demographic and Health Surveys and similar maternal and child health/family planning surveys**

The Demographic and Health Surveys (DHS) are large, population-based national household surveys on maternal and child health. The DHS were initially developed by the U.S. Agency for International Development in collaboration with governmental agencies in

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developing countries. Many countries now conduct their own DHS surveys without external support. Although until now the DHS primarily have been used to look at family planning/fertility issues, this data source also includes a wide range of socioeconomic and sociodemographic information and information on health status and use of health care, including information on people's perceptions of available services. The DHS have been conducted over the past 10 years in 54 developing countries by local census departments or nongovernmental organizations; the DHS have been conducted at least twice in more than 20 countries, and three times in several countries, permitting examination of time trends. A number of countries now conduct their own DHS with minimal or no external donor support; similar national surveys of Maternal and Child Health/ Family Planning (MCH/FP) have been conducted in many countries with support from international agencies such as UNFPA and UNICEF or entirely with national support.

In most countries, the DHS permit estimates at the national and provincial (or similar "zonal") levels only. Some countries have developed district-level DHS that are conducted in a sample of districts during the interval between the larger nationwide surveys. Countries that have their own national MCH/FP surveys may use sampling frames that permit comparisons at the district level.

The Demographic and Health Surveys have been criticized by some sources for being costly to design and conduct, and for having required external donor support for their development. However, given the extensive work already accomplished, including the development of detailed protocols for every aspect of conducting the DHS, and given the strengths of the DHS, using and building on the DHS may be more efficient than designing completely new household surveys -- even in countries that have not conducted the DHS in the past.

Although the DHS generally have been thought of primarily as surveys of family planning issues, the DHS actually contain a rich array of variables of great relevance for assessing equity in health. These variables include measures describing socioeconomic, geographic, gender (for children) and ethnic differences, as well as measures of infant and child health status and utilization of maternal and child health care services. For example, the DHS can be used to assess whether there are gender differences in the immunization or growth rates of young children or in children's receipt of treatment for diarrheal or respiratory disease. Similarly, the DHS could be used to assess ethnic differences in the receipt of antenatal care or in whether births are attended by trained personnel.

Although rarely used up to now, the potential utility of the DHS data for monitoring equity should be recognized. Countries should assess how to modify the DHS by adding additional information elements or by changing the sampling frame, for example, to make it more useful for their own purposes. Countries that already have DHS should seriously consider further investment in modifying the survey to make it more suitable for their needs, rather than in designing entirely new household surveys. For example, although the DHS have focused on

maternal and child health, they potentially could be modified to collect information on the health of the entire population.

**A few examples of information generally included in the Demographic & Health Surveys (DHS) or similar surveys, that could be used to assess equity in health:**

*Socioeconomic status measures in DHS*

**Education (years of schooling of the mother and of the head of household)**

**Living conditions**

**materials of construction of the walls, floor, and roof of the house**

**amenities in the household, e.g., electricity, radio, kind of stove/fuel used, electricity**

*Health status measures in DHS*

**Child mortality**

**Children's nutritional status**

**Maternal nutritional status**

**Incidence of acute diarrhea and acute respiratory illness among children**

*Health care utilization measures in DHS*

**Children's immunization status**

**Antenatal care**

**Delivery care (setting, type of attendant)**

**Receipt of medical attention for children with diarrhea, by type of personnel who gave the care and type of facility**

*Measures of health care quality in DHS*

**Women's satisfaction with the family planning services received, by sector (public or private) and type of facility (hospital or health center)**

The Demographic and Health Surveys and similar maternal and child health/family planning surveys have many advantages and some disadvantages, summarized in the lists below:

**Advantages of the DHS and similar surveys**

They permit one to look at health status and use of health care by socioeconomic status, gender, urban versus rural residence, and race, ethnic group, or religion.

- They include measures of health and health care that reflect some of the most important indicators for assessing equity -- e.g., child mortality, infant mortality, children's malnutrition, immunization coverage of children.
  - Relatively high quality of the design and data.
  - Relatively low costs, because protocols have already been developed and modifications likely to be needed for use in a given country will be less costly than designing new surveys,
  - The sampling frame permits assessment of equity between social groups within provinces and within the country as a whole. Some countries have district-level DHS, permitting assessment of equity within and between districts.
- ❑ Disadvantages of the DHS and similar surveys
- Current survey content is restricted to maternal and child health issues.
  - In most countries, the DHS cannot be used to assess equity between and within districts.

#### ❑ Demographic and Health Surveys (DHS) or similar surveys: an overview

- The DHS and similar maternal and child health/family planning surveys are a seriously under-utilized resource for ongoing monitoring of equity in health in low- and middle-income countries. These surveys permit one to make comparisons among socioeconomic, geographic, gender, and ethnic groups within countries.
- DHS surveys include a wide range of indicators of maternal and child health status, use of health care, and anthropometric assessments. They are generally of high technical quality; the sample size and frame permit estimates at the national and provincial levels.
- Demographic and Health Surveys (DHS) have been conducted at least once in more than 60 countries and have been conducted 2-3 times in many nations, permitting analysis of time trends. Countries that already have DHS or similar surveys should seriously consider investing in modifying the survey to make it more suitable for their needs, rather than designing entirely new household surveys. National researchers should be trained in the use of DHS and other large surveys.
- Information on the DHS -- and the actual DHS data, for many countries -- are available without charge on the Internet at the DHS web-site: <http://www.macoint.com/dhs/indicatr/datasearch.asp>

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## □ Living Standards Measurement Study (LSMS) and similar surveys

The LSMS is a large population-based survey developed by the World Bank to monitor economic conditions and trends in developing countries. The first LSMS surveys were conducted in 1980. By now, at least 21 countries have LSMS and several more have LSMS-type surveys; some have conducted their LSMS three or more times, permitting the analysis of trends. The LSMS surveys contain information on poverty, malnutrition, access to social services (including schools and welfare programs), and use of and expenditures for health care, food, and other household consumption. Some LSMS surveys contain information on the kind of health care facilities used. As in the case of the DHS, substantial investment has been made in developing sound protocols and instruments.

A major effort is currently underway at the World Bank to modify the LSMS questionnaire. As with the DHS, additional input is needed from the countries themselves to shape the LSMS to make it most useful. However, as is also the case with the DHS, very few people in developing countries are aware of the LSMS and its potential uses; systematic efforts are needed to make it more widely known and accessible, as well as to solicit national input on country-specific modifications.

An LSMS survey could permit one to assess whether the proportion of household income that was used for health-care services was changing over time, in relation to health sector reform. To assess equity, one would look at survey data before and after implementation of a given policy change, examining whether the burden of payment for health care was getting heavier or lighter, especially for more socioeconomically disadvantaged households. Many recently implemented health-care reforms place an increasingly heavy burden of payment on the people who can least afford it, which often results in further impoverishment.

In a document called “The household survey as a tool for social change: lessons from the Jamaican Survey of Living Conditions”, (Grosh, 1991) Margaret Grosh gives an illustration of how the LSMS could be used to inform policy. The text immediately following this paragraph quotes another source providing an example of how the LSMS was used recently in South Africa to guide policy. While the examples are not focused on informing policy specifically in the health sector, one can imagine the health implications of the examples given as well as the potential applications of such information to policy decisions within the health care sector itself, considering the range of variables included in the LSMS:

“The 1993 LSMS survey in South Africa provided for the first time a comprehensive credible data set for the entire territory of South Africa, including the homelands. The survey was completed just

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before the [1990 elections and] quickly put to use by the new government and by academic researchers...By providing sound information on the nature and extent of poverty, the information contained in the LSMS survey has helped to shift attention to pragmatic discussions of policy options for alleviating poverty. For example, the government decided to offer young women in rural areas jobs in public works projects since the data showed that this group was often needy and could obtain child care. Also, because the survey data have revealed that the old age pension program is well targeted, attention has moved on to reforming other programs that may be less effective.”(Grosh, Steele, *et al.*, 1996)

- ❑ **The LSMS and similar surveys are another under-utilized resource that could be useful for assessing equity in health care in low- and middle-income countries. LSMS surveys have been conducted in at least 21 countries, have been conducted more than once in several places, and have at times been conducted annually; in addition, many countries have their own “LSMS-type” surveys. Although LSMS surveys lack information on health status, they can be used to assess a very important indicator for assessing equity in the financing of health care: the proportion of households’ income/expenditures devoted to health care among different socioeconomic groups of the population. Data from the LSMS also may be used to assess the population distribution of important living conditions that are basic determinants of health status. Estimates generally can be made at the national and provincial levels. As is true of the DHS, the technical quality of the data is generally high. And as with the DHS, further efforts should be made to adapt the LSMS to make it more useful for assessing health equity and to train national researchers to use the LSMS to inform policy.**
- ❑ **Information on the LSMS (including the documents *A Guide to LSMS surveys and Their Data Sets* and *A Manual for Planning and Implementing the LSMS Survey*) can be obtained via the internet at: <http://www.worldbank.org/html/prdph/lms/lsmshome.html>**

#### ❑ **Ongoing community-based systems for monitoring children's growth and infants' immunization coverage**

Community-based monitoring systems are another generally under-utilized source of potentially useful information for assessing equity in health care. In most countries, through cooperative efforts with UNICEF, community-based systems have been established for ongoing monitoring of children’s growth. WHO’s EPI programme has worked with countries to establish community-based monitoring of vaccination coverage. Such systems may be useful for monitoring equity between different geographic areas, particularly when the monitoring systems include

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samples of children not attending the health care facilities. However, some caution must be exercised in interpreting the data because both efforts generally rely primarily on reporting from health care facilities, including both hospitals and health centres; hence, children not using the health services are not represented, and it can be misleading to use these sources of estimates of vaccination coverage of the entire population, including the most disadvantaged groups. The DHS permits true population-based estimates of children's nutritional status and vaccination coverage; where both sources are available, it would be useful to compare DHS data with data from community-based monitoring systems, to assess the extent to which the community-based monitoring systems are capturing the entire population including the most disadvantaged people.

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## **Approaches to collecting new data**

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Efforts to improve existing data sources should be fully considered before creating new sources. Only after establishing that an appropriate routine, ongoing data source does not already exist, should one consider establishing new data collection efforts or replicating previous one-time efforts for ongoing monitoring. Examples of approaches to collecting data that may be particularly suitable include:  *periodic exit interviews at health-care facilities*;  *community surveys using rapid-assessment techniques*;  *“sentinel population” or “sentinel territory” surveillance*; and  *qualitative and quantitative information from key informants*.

### **Periodic exit interviews at a sample of health-care facilities**

One of the most valuable ways of assessing equity in access to health care is to conduct periodic surveys of people as they leave health-care facilities, obtaining information on selected measures of socioeconomic status and geographic area of residence and potentially on a range of specific issues. Even by itself, the information on socioeconomic and geographic characteristics of users of a facility can be compared with the characteristics of the population intended to be served by the facilities, to determine whether services are being used differently across segments of the intended catchment populations. This comparison should be made at the primary, secondary, and tertiary (or quaternary) levels of care. In many countries, the more privileged socioeconomic and geographic groups are over-represented among the users of higher levels of service (secondary, tertiary, and quaternary care). Special measures to address such inequities can only be designed based on knowledge (by inference) of the under-represented groups. Exit surveys may also provide useful information on the reasons why people use a given facility and don't use others. For example, exit interviews could be an efficient way to find out why people are seeking care at referral-level institutions for problems that could be addressed at a primary-care level.

### **Community surveys using rapid assessment methods**

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Ongoing community surveys are often conducted by sectors other than health, about issues with marked effects on health and/or the use of health care services, e.g., transportation, labor, sanitation/water, nutrition. A number of relatively low-cost rapid assessment techniques for conducting community-based surveys have been developed and piloted extensively in industrialized and developing countries.(Nordberg, 1988; Selwyn, Frerichs, *et al.*, 1989; Rosero-Bixby, Grimaldo, *et al.*, 1990; Oyoo, Burstrom, *et al.*, 1991; Vlassof and Tanner, 1992; Anker, Guidotti, *et al.*, 1993; Satia, Mavalankar, *et al.*, 1994) For example, community surveys using rapid assessment methods can be conducted to obtain information on the health services that people use (public versus private, and the type and level of facilities), the reasons why some people do not use health services, and the reasons why they do or do not use services closest to where they reside. Such surveys can uncover important disparities in the perceived quality and appropriateness of health services. (It should be noted that school-based health surveys will have limited utility for assessing equity if the poorest children do not attend school.)

**□ “Sentinel population” or “sentinel territory” surveillance**

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Convenience sampling is used when it is not feasible to obtain a statistically representative sample (e.g., because of inadequate data quality and completeness) but when data could be reliably collected from one or more “typical” subgroups of the target population. “Sentinel population” or “sentinel territory” surveillance has become a relatively popular approach to convenience sampling for epidemiologic monitoring (Andersson, 1989; Ramzy, 1994; Chandiwana, 1997) and should be considered when developing a community survey to assess equity. Monitoring sentinel populations/territories must be distinguished from sentinel site monitoring, where only clinical facilities are sampled; the former is population-based, the latter facility-based (see discussion of sentinel site surveillance below under “Facility-based data: some words of caution”). Sentinel surveillance has proven useful for management purposes, to provide rapid feedback to guide program operations; for example, Cutts (Cutts 1988), argued for the advantages of sentinel surveillance over cluster survey sampling for monitoring immunization coverage in Mozambique for program management purposes. Sentinel surveillance may or may not be inexpensive; as noted above, low-cost rapid assessment techniques can be applied to statistically representative samples as well as to “typical” samples selected for sentinel surveillance. Information from convenience samples (including from sentinel territories) may be most helpful as a supplement to information from representative samples, permitting more timely data collection and more in-depth exploration.

The obvious weakness of convenience sampling is the risk of bias; the very factors that make a population convenient to sample often make that population non-representative, e.g., geographic accessibility or an unusually high degree of cooperation and commitment from health authorities or the population. Systematic criteria must be used to select a sentinel population or territory that is most likely to be representative of the reference population as possible. Whether statistically representative or convenience samples are used, data should be collected according to carefully defined criteria and protocols; recommendations have been developed for a number of convenience sampling techniques. Regardless of the data collection strategies used, the implications of the choice of methods for conclusions about equity must be carefully and specifically considered.

### **□ Qualitative or quantitative information from knowledgeable community informants**

Qualitative and/or quantitative information from knowledgeable informants (e.g., traditional healers, tribal or religious leaders, and teachers) can be crucial both to identify the social groups and issues of concern and to supplement deficiencies in information from the census or vital records. In some settings, key community informants may be the most reliable source of information on births and deaths. Even when quantitative data are available, qualitative data from focus groups (Prevention of Maternal Mortality Network, 1992; Satia, Mavalankar, *et al.*, 1994) and key informants can be a crucial supplement to formulate specific hypotheses to be tested and to inform action. For example, qualitative data can be crucial for understanding the population’s perceptions of the quality of available services, the principal obstacles to good health, and the most promising directions for action. To avoid bias, there must be systematic criteria for constituting the

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focus groups, selecting key informants, and conducting discussions. Particular concerns are to ensure that focus groups adequately represent vulnerable people (who often do not use health care facilities because of a range of barriers). Key informants must include members of the public along with providers of health/social services, who generally are only aware of those who use services; in addition, providers' perspectives are shaped by their own backgrounds and concerns, which may differ from those of the general public in important ways.

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#### **IV. C. Methodologic considerations in selecting indicators to assess equity in health**

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This section is divided into sub-sections addressing selected methodologic considerations that arise when selecting indicators in each of the following major categories of indicators:

- health status;
- major determinants of health status apart from health care; and
- health care, further sub-dividing indicators of health care as follows:
  - health care financing;
  - health care resource allocation; and the
  - utilization and
  - quality of health care.

General criteria for selecting indicators to monitor equity are presented under Step 5 in Chapter II; those criteria apply to all of the indicator sub-categories covered in this section.

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#### **Indicators of health status**

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##### **Important general methodological considerations in selecting indicators of health status to assess equity**

Following are several general methodologic considerations that often apply when selecting indicators of health status to assess equity:

- Positive indicators of good health, rather than indicators of sickness or death, would be ideal.** The specific options recommended in this document, however, are restricted to measures of morbidity and mortality, primarily because measures of good health are

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not now available in existing data sources. A high priority should be given to developing practical measures reflecting good health that could be applied to monitoring and research on equity.

- ❑ **Statistical power is a recurrent concern** that must always be considered in selecting indicators of either morbidity or mortality data for making comparisons among subgroups. For example, child mortality, infant mortality, or even low birth weight may not occur frequently enough in a district or a particular group of people to permit comparisons from year to year. Sometimes data can be aggregated over multiple years, and sometimes indicators of different conditions (either morbidity or mortality or both) can be combined together to give greater statistical power. However, grouping conditions can make the analysis and interpretation of policy implications considerably more difficult.
  
- ❑ **The recommended list of indicators is weighted heavily toward measures of maternal and child health, with relatively little representation, apart from the life expectancy measure(s), of indicators reflecting non-communicable diseases in adulthood.** In part this reflects the lack of population-based data on chronic and non-communicable diseases of adults. However, there are additional considerations. The “epidemiologic (or health) transition” denotes a shift in the disease profile of low- and middle-income countries to include an increasingly significant burden of chronic non-infectious disease associated with longer life expectancy, while high rates of infectious disease and premature mortality due to infectious causes persist. Because of the epidemiologic transition, it seems important to include in any monitoring system some indicators of health status that reflect chronic and non-communicable disease as well as infectious disease. On the other hand, it should be kept in mind that infectious diseases, nutritional disorders and the other major problems of maternal and child health that are highly preventable continue to disproportionately affect the least advantaged population groups in all countries. These conditions are therefore heavily represented in the list of recommended indicators of health status for monitoring equity.

❑ A recent study by Gwatkin and Heuveline took data from Murray and Lopez (Murray, Lopez, *et al.*, 1996) on global burden of disease and disaggregated it according to measures of overall per capita income for specified geographic regions. With this approach, they found that:

➤ *“Non-communicable diseases were responsible for most (56%) deaths in the world in 1990. But a closer look at the figures shows that these deaths were unevenly distributed across social class. For example, non-communicable diseases caused a notably smaller percentage of deaths (34%) among the poorest 20% of the world’s population and a much higher percentage (85%) among the richest 20%. The situation for communicable, maternal, and perinatal diseases was the reverse: they caused 33% of*

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*deaths overall but 56% of deaths among the poorest [20% of the world's population] compared with only 8% among the richest.” (Gwatkin and Heuveline, 1997)*

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**❑ Mortality: Recurring challenges when using indicators of mortality to assess equity in health and health care**

Carr-Hill (Carr-Hill, 1990) discusses several important methodologic issues regarding the use of mortality indicators to assess equity. Options for and limitations of the use of mortality data are summarized in a 1989 PAHO publication. (Pan American Health Organization, 1989) Mortality data generally are derived from vital records. Problems in using mortality as an indicator of a population's health status to monitor equity include:

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**Most indicators of mortality occur too rarely at the local level to permit monitoring their rates, except in very populous districts; grouping causes into relevant categories can be helpful.**

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Numbers of deaths are often relatively small at the district or sub-district levels. Comparisons of mortality rates even at the provincial level between population subgroups within a province (e.g., very poor, poor, and non-poor) may be unreliable. Data from multiple years may be aggregated to obtain more stable rates. Where cause-of-death data are of reasonable quality, large groupings of causes (e.g., infectious diseases) rather than single causes (tuberculosis deaths) generally should be used in order to have sufficient numbers to analyse data at subnational levels. The broad cause-of-death groupings used in the WHO Global Burden of Disease study (Murray, Lopez, *et al.*, 1996) can be useful for monitoring equity, but only in countries where cause-of-death data are of good quality. Communicable, maternal, perinatal, and nutritional conditions (Group I) disproportionately afflict poor people and also are recognized as particularly highly preventable with basic public health measures, making this a meaningful category for the purposes of policy-oriented assessment of equity. Injuries also are likely to disproportionately affect the poor and to be relatively preventable with basic public policy measures (outside the health-care sector); hence they may be an important group to assess alone or even when grouped together with Group I for certain assessments requiring larger numbers.

**Broad cause-of-death categories used in Global Burden of Disease study:  
(Murray, Lopez, *et al.*, 1996)**

**I: Communicable, maternal, perinatal, and nutritional conditions;  
II: Noncommunicable diseases (including mental health conditions and cancer);**

**and**

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**III: Injuries (including intentional and non-intentional injuries)**

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**Deaths are more likely to be under-reported in disadvantaged groups; neonatal and infant mortality are particularly likely to be under-reported, compared with deaths among older children and adults.**

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Deaths are under-reported in general in many countries, whether their source is vital records or hospital data; disproportionate under-reporting of mortality in the most disadvantaged groups is of particular concern in monitoring equity. The Brass method (Kralay and Norris, 1978; Palloni, 1979; Bicego, Augustin, *et al.*, 1989; Woelk, Arrow, *et al.*, 1993) and other techniques were developed for "estimating unregistered and/or undiagnosed deaths... by age, sex, and cause group." (Pan American Health Organization (PAHO), 1993) In some countries with very poor death registration among large populations who are highly impoverished, traditional birth attendants or community leaders may need to be officially involved in the ongoing routine reporting of births and deaths in order to achieve more complete vital registration in the near future. (Jewkes and Wood, 1998)

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**Cause-of-death data are often of poor quality, and the quality is likely to vary among social groups or geographic areas.**

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Cause-of-death data are often of poor quality, even in many high-income countries. Of particular concern in assessing equity, however, is the fact that there is often *differential quality* of cause-of-death data for different populations or territories, with the most vulnerable populations and least advantaged territories likely to have substantially poorer quality data.

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**Mortality is an extreme end-point and does not reflect quality of life.**

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Another limitation of mortality measures is that, as an extreme occurrence and endpoint, mortality does not reflect quality of life. Measures such as Quality-Adjusted Life Years (QALYs) or the more recently developed Disability-Adjusted Life Years (DALYs) were formulated in part to compensate for this limitation. Concerns have been raised regarding the equity implications of the

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way in which disability- or quality-adjusted life-years have been used as the basis for resource allocation decisions. (Wagstaff, 1991) However, a distinction should be made between how such measures have been widely used until now and their potential use for assessing equity, i.e., if applied to make comparisons between and among social groups with different levels of social advantage. Comparisons among more and less advantaged social groups of the DALYs lost overall or due to particular causes, could be extremely useful for assessing equity, because of the information omitted when considering mortality only. Attempting to compensate for the lack of data to permit disaggregation of morbidity or mortality statistics at either the individual or the microgeographic levels, Gwatkin and Heuviline (Gwatkin and Heuviline, 1997) took a creative approach to attempting to look at data on DALYs disaggregated according to per capita income of large geographic regions being compared with each other, which might be applied to making comparisons between sub-national territories.

Although the potential use of DALYs as an indicator for research on equity should be explored carefully, DALYs and related measures are not included in the list of recommended options at this time, not only because of the complexity of their calculation even from reliable data but primarily because their calculation relies on sources of data that are unavailable on a routine basis in most countries. Calculating DALYs requires population-based data on cause of death and on disability. As noted above, in many countries the quality of cause-of-death data in death records is not only generally deficient, but there is differential quality among more and less advantaged social groups. In addition, the limitations of facility-based data for estimating disability follow from the general limitations discussed earlier, i.e., they reflect users of services, among whom the most disadvantaged people are likely to be under-represented.

❑ **Morbidity: Recurrent problems in using morbidity indicators to monitor equity in health and health care**

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**Population-based data on morbidity are even more scarce than population-based data on mortality.**

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In a number of countries, there may be ongoing sentinel surveillance systems with acceptable population coverage, monitoring the incidence and/or prevalence of a number of diseases that are highly relevant to equity (e.g., guinea worm, malaria, tuberculosis, HIV seroprevalence). In such cases, incidence or prevalence data on these diseases may be useful for monitoring equity between different geographic areas.

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**Statistical power is also a recurrent concern in monitoring morbidity, unless the illnesses or conditions are very common.**

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Statistical power is generally less of a problem in monitoring morbidity than when monitoring mortality. However, for many diseases (or their precursors or key risk factors that could be used as markers for the diseases), it still may not be possible to monitor subgroup differences in otherwise relevant illnesses that occur too rarely for reliable estimates of differences in rates.

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Indicators of major determinants of health  
apart from health care

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Five very well established determinants of health status have been included in the table of indicators in this category that are recommended for consideration:  *water and sanitation*,  *food security*,  *adequate housing*,  *poverty (based on income, expenditures, or assets)*, and  *education*. Each of these factors should be measured if possible at both the individual and group- or area-levels. The table of indicators, comparisons, and data sources makes comments on each of these indicators. In addition, the reader is referred to material on measures of education and of income, expenditures, or assets discussed in Chapter IV.A. In addition to the five very traditional indicators of major determinants of health status apart from health care that are listed in the accompanying table, an additional, less universally accepted factor also is included for consideration:  *income inequality* within the population of a given territory.

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**Indicators of the major determinants of health status apart from health care cannot be used to make comparisons among socioeconomic groups that are defined using the same criteria. All of the health determinants apart from health care are strongly and directly related to socioeconomic status, and hence these factors are the basis for most measures classifying people into socioeconomic groups. Although this may be a source of potential confusion, it is essential to include indicators of the major determinants of health apart from health care within any framework for assessing equity in health.**

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Because of the potential for confusion about the difference between (a) a factor used to define a way of classifying social groups to be compared with each other, versus (b) a factor that

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is the basis for constructing an indicator whose distribution is to be compared among different social groups, it is tempting to eliminate this category of indicators of determinants of health apart from health care. However, it is not possible to do this because the biggest threat to health equity is overall socioeconomic inequity. The powerful relationships between individuals' socioeconomic status and health have been demonstrated repeatedly.(Feinstein, 1993; Kaplan and Keil, 1993; Pritchett and Summers, 1996; Krieger, Williams, *et al.*, 1997) Overall, factors such as poverty, safe water and sanitation, food security, housing, and education are likely in fact to be more powerful determinants of health status than almost any health care service.

As noted above, **□ income inequality** within the population of a given territory is suggested for consideration as a key indicator of determinants of health to be monitored in addition to the five very traditional indicators reflecting water/sanitation, food supply, housing, poverty, and education. This indicator is only meaningful to assess differences at the group- or area-level, and the only comparisons that are suggested to be made with this indicator are comparisons among geographic groups. As noted earlier, evidence is accumulating that indicates strong associations between the level of overall socioeconomic inequalities and poor health in populations that cannot be explained by absolute levels of poverty.(Wilkinson, 1992; Wilkinson, 1992; Kaplan and Keil, 1993; Kaplan, 1996; Kaplan, Pamuk, *et al.*, 1996; Kennedy, Kawachi, *et al.*, 1996; Wilkinson, 1996; Kawachi and Kennedy, 1997; Lynch, Kaplan, *et al.*, 1998) While this perspective is not universally accepted, it has been viewed as sufficiently worthy of consideration to appear among the very limited number of key indicators currently used by the Pan American Health Organization (PAHO/WHO) for routine monitoring of health in the countries of the Americas (Pan American Health Organization/ World Health Organization, 1997) and has been used by the United Nations Development Programme as an important variable for assessing overall development within countries.(United Nations Development Programme, 1996; United Nations Development Programme, 1997)

There also is increasing evidence that a range of characteristics of the communities in which people live and work are strongly and independently associated with the health status of the individuals in those communities, even after taking into account many individual factors. In addition to more obvious characteristics of the environment such as poverty levels or levels of crime, violence, or unemployment in a community, a role as important determinants of health has been suggested for diverse social factors including social networks, the degree of community cohesion, and the degree of income inequalities.(Kaplan, 1996; Kaplan, Pamuk, *et al.*, 1996; Bartley, Blane, *et al.*, 1997; Lynch and Kaplan, 1997) The table of suggested indicators does not include such measures of social factors among the few determinants of health listed, primarily because more research is needed to clarify both which group- and area-level factors would be most useful to include in routine monitoring and how to measure those factors in a standardized way; these are important areas for future research. The use of microgeographic markers (see discussion in Chapter IV. A. on microgeographic markers of socioeconomic status) can permit one to link individual factors with a range of factors measured at the area level.

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## **Indicators of health care**

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While not the only determinant of health status, health care is an important factor. Many health services -- including immunizations, basic obstetric care, family planning, curative services for the most common childhood infectious diseases, care for victims of trauma, screening and treating women at elevated risk for cancer of the uterine cervix, and early detection and treatment of tuberculosis, to mention only a few examples -- have well documented effectiveness in improving health. Furthermore, the degree to which a society provides an equitable allocation of health care services is itself an important measure of equity in that society.

Equity in health care means that health care resources are allocated according to need, health services are received according to need, and payment for health services is made according to ability to pay. Indicators should be chosen to reflect each of these aspects, and the following section is divided into subsections on four different aspects of health care:  financing,  resource allocation,  utilization, and  quality of health care.

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### **Indicators of health care: financing of health services**

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Indicators are needed to reflect the distribution across different social groups of the burden of payment for health services. An equitable situation is one in which payment is made according to ability to pay; this would require that groups with fewer economic resources pay less not only in absolute terms but also as a proportion of their resources (generally assessed in terms of income or expenditures, although in many cases disparities would be even greater if wealth and assets were also taken into account). Progressive general taxation is the most equitable form of financing health services, while out-of-pocket payment is the least equitable; social insurance schemes generally fall somewhere in between. Another WHO document, "Methods for evaluating effects of health reforms," (McPake and Kutzin, 1997) provides an excellent discussion and examples of issues to be considered when selecting indicators of the financing of health services.

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### **Indicators of health care: resource allocation**

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Documenting how resources for health care are allocated provides evidence of the theoretical availability or capacity of services for different social groups, which should be

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distinguished from the actual receipt of services by the population (discussed below under Indicators of the Utilization (or Coverage) of Health Care Services. Measures of health care resource allocation should include: measures of financial allocations for health care; measures of the distribution and capacity of health care facilities; and measures of the distribution and capacities of health care personnel. Clearly, the allocation of resources in many other social sectors (e.g., transportation, education) has a major influence on the accessibility of health facilities, but describing appropriate measures of the allocation (or utilization) of services outside the health care sector is beyond the scope of this document.

Information on resource allocation according to geographic area is routinely available in administrative data within the health care sector. Routine data do not, however, reveal how resources are allocated among different socioeconomic, ethnic, or other groups. In addition, among the most important challenges in developing methods for monitoring equity in health and health care are the lack of routine data that reflect the actual functional capacities and types of facilities and the actual activity levels and types of personnel.

Merely counting personnel or facilities per population, without differentiating the type or level, is insufficient to assess equity. In many countries, there may be numerous health care facilities with very little capacity to meet people's basic health-care needs because of inadequate equipment, supplies, or personnel. Similarly, there may be many health-care personnel assigned to work in an area, but there is limited benefit to the population if the level of training of the personnel is ill-suited to the population's health needs, or, as happens in many cases, if the positions officially noted in administrative data have little relationship with the actual staffing levels because of entirely unfilled positions or positions filled with part-time personnel.

Routine data rarely reflect adequately the actual capacity of a facility, including the kinds and quantities of services that a given facility could actually provide; actual capacity is limited by such factors as the facility's size, the availability of essential drugs, basic supplies and equipment, and the state of functioning of the facility's equipment. Simply comparing numbers of health care facilities per population will not adequately assess equity in health care resource allocation. Minimally, the level of each facility needs to be characterized (e.g., primary, secondary, tertiary/ quaternary) according to uniform national criteria. Facilities that do not meet established quality standards for the designated level should not be counted as facilities functioning at that level. For example, a district hospital that lacks essential drugs, functioning x-ray equipment, or basic laboratory equipment cannot be compared with a fully equipped hospital. A facility's capacity would also be related to the number of personnel and the times they are staffing the facility, as well as the range of services offered. To be useful for considerations of equity, simple measures must be developed to describe the actual capacity of facilities. Because such measures are not currently available, one must exercise caution in interpreting data indicating the geographic location of facilities even when it is known whether the facilities are deemed to operate at the primary, secondary, or tertiary/quaternary levels.

Levels of budgetary expenditures and measures of the distribution and actual activity

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levels of qualified personnel should reflect the actual functioning of facilities, and are therefore more highly recommended as measures of health care resource allocation to supplement information simply describing the geographical location of health care facilities of different levels (primary, secondary, tertiary/quaternary).

Routine administrative data in the health sector also rarely adequately reflect the actual activity of health personnel. Often, information on physicians or nurses per population is specified by the number of places that were theoretically allotted to a given territory, although positions for qualified professional are largely unfilled in rural/remote areas. Even when activity levels (e.g., as percentages of full-time equivalents based on uniform national definitions) are noted, the overall numbers of health care personnel per population are not a useful measure for assessing equity in health care resource allocation without specifying the professional level of the personnel. A disadvantaged population may have the same number of health care personnel as a more advantaged population, but the mix of auxiliary personnel and qualified professionals could be often completely different.

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### **Indicators of health care: the utilization and quality of health services**

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Equity in health care implies a commitment to ensuring high standards of real (not only theoretical) access, quality, and acceptability in health services for all. Real access requires active effort to remove a range of important obstacles--financial, geographical, physical, or other logistical barriers (e.g., conflicting family or work responsibilities); linguistic, cultural, or educational barriers; or a perception of low quality of the services--that prevent certain groups from receiving services available to others. Measuring the actual utilization of health services -- rather than the theoretical availability based on geographic location, for example -- is the only way to detect the effects of the full range of factors that can act as barriers to access.

#### **❑ What does “access” mean? Actual utilization versus theoretical availability of services**

To assess equity, it is essential to measure health care utilization, i.e., the actual receipt of services or the actual coverage of the population with services, in addition to the availability of services. Actual utilization is distinguished from the theoretical "availability" of health services reflected by where and how facilities and personnel are allocated.

Some scholars disagree about whether utilization of services is an acceptable measure of "access," because it does not take into account the effect of different "preferences." (Mooney, Hall, *et al.*, 1991) This controversy notwithstanding, it is only by measuring the actual utilization of

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health services, rather than the theoretical availability of services, that one can determine whether health care actually is or is not delivered. There are multiple obstacles to obtaining access to health services in addition to obvious financial, geographical, and linguistic barriers. Obstacles include, for example, a lack of awareness of the need for a given service or of how to obtain it, fear of adverse legal or social consequences of receiving care, or other beliefs that could deter care-seeking. Perceived low quality of care can be a powerful barrier to utilization even of "free" services, especially when time costs (travel and waiting times) to receive services are substantial. If such powerful influences are not taken into account, the concept of "access" may not be very meaningful and may result in a tendency to "blame the victim." Approaches to the delivery of health care that are suitable for some social groups may not be appropriate for others with fewer advantages (lower levels of education, less access to comfortable transportation, or loss of income associated with the time required to receive health care).

Dutton (Dutton, 1978) has pointed out that discussion of use of care among the poor has tended to overestimate the role of "attitudes" and to underestimate the role of modifiable barriers within delivery systems. Social networks have been found to be strong influences on use of prenatal care (St. Clair, Smeriglio, *et al.*, 1989), and strategies depending on mobilization of community social networks have been used successfully to promote increased use of prenatal care by vulnerable groups.

Measuring actual utilization implicitly takes all significant barriers to realized access into account. A limitation of this approach, however, is that one needs to consider whether under particular circumstances certain groups may freely choose not to seek certain services considered beneficial by the society at large. An example would be a religious group that, despite reasonable efforts to provide understandable information on associated risks and benefits, believes that certain procedures should not be performed. (In this case, one still might ask whether members of that group were truly free to make an informed choice about whether or not to receive a given service.) While such instances of truly free and informed choice to forgo specific services do occur, the far more usual circumstance is that in which a population group at particular risk of underutilization does not receive a given service (at all or in a timely fashion) in large part because they lack sufficient information and/or support to overcome ameliorable obstacles. It is important to consider whether the health sector (collaborating with institutions in other sectors where appropriate) has made a reasonable effort to reduce modifiable barriers, and whether an individual's choice not to receive services is truly made freely, based (at a minimum) on an informed decision. The "preference" of an individual who has not been adequately informed (in a manner that individual can understand) of the importance of a given service or who requires and has not received special support represents a manifestation of lack of access, rather than free choice. For example, an individual's decision, conscious or otherwise, to meet her or his family's basic food, shelter, or educational needs rather than paying to receive health care represents a lack of access. Aday distinguishes between "potential access" and "realized access," the latter measured by utilization of services as evidence "that people actually got into the system and obtained specific services".(Aday and Andersen, 1981; Aday and Andersen, 1984; Aday, Fleming, *et al.*, 1984)

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**❑ Concerns arising from lack of evidence of the effectiveness of many health care services**

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**If the effectiveness and quality of care are not considered, data showing increasing use of health services by disadvantaged groups could give a misleading or overstated impression of progress toward equity; disadvantaged groups could be receiving more unnecessary and/or harmful services or procedures.**

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Another difficult theoretical issue that arises in trying to select indicators of utilization for monitoring equity relates to the effectiveness of many health services for improving health outcomes. Musgrove (Musgrove, 1986) discussed the need in a truly comprehensive consideration of equity in health care to focus not only the "probability of needing medical care" and the "conditional probability of receiving treatment, given the need for it," but also the "probability of being cured by a treatment" and the "probability of recovering without treatment." Presumably such considerations could be broadened to relate not only to disease cure but also to health promotion and disease prevention. Some authors have argued that one should only consider access to services that have demonstrated links to improved health outcomes. (Weissman and Epstein, 1994) However, it is important to recognize that rigorous research linking most individual health services with health outcomes has been limited. The "gold standard" for establishing the effectiveness of a given service is evidence from randomized clinical trials, which can be extremely expensive to conduct, particularly with adequate statistical power and generalizability to diverse populations and settings. Requiring definitive evidence of measurable benefit for every publicly-funded health service could lead to the denial of almost every health service (including most prenatal care and well-child care services other than immunizations) for persons depending on publicly-funded services, while more affluent persons continued to receive such services as a well-established standard in the private sector.

Reasonable skepticism about the effectiveness of services is important, especially when global indicators such as numbers of visits or hospital days are used and information is lacking on the content or outcomes of the services in question. Wyszewianski and Donabedian (Wyszewianski and Donabedian, 1981) pointed out that, if the effectiveness and quality of care are not considered, data showing increasing use of health services by disadvantaged groups could give a false or overstated impression of progress toward equity; disadvantaged groups could be receiving more unnecessary and/or harmful services or procedures. Furthermore, Csasz (Csasz, 1990) points out that all institutions, including health services, have a vested interest in "self-perpetuation and self-projection" and therefore tend to focus on indicators that are more likely to justify continued resource allocation for existing services, regardless of their effectiveness and regardless of the existence of alternative interventions in other sectors.

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## ❑ Quality of care, not simply quantity

Under contemporary circumstances in virtually every country, assessing equity in health care requires data describing the content and quality, and not just the quantity, of services. Differences in perceived quality of care available to different social groups often explain differences in utilization. Various approaches to measuring quality can be taken. One of the most important approaches involves the routine collection of qualitative data (e.g., via focus groups, key informants, or rapid assessment community surveys) on different groups' perceptions of the quality of services and reasons for use and non-use.

Wyszewianski and Donabedian (Wyszewianski and Donabedian, 1981) discussed some of the challenges in examining equity in the quality of care. Donabedian distinguished three components of quality of medical care to be assessed: *structural aspects* (the appropriateness of settings and providers of care); *process aspects* (the content of the care received, including consideration of patient satisfaction and considering both the technical and interpersonal performance of providers (Donabedian, 1988)); and *outcomes* (the actual impact of care on health status). Examples of process measures of quality could include: appointment/clinic waiting times; whether treatments/medicines are included in a visit or must be sought separately; and satisfaction with services. Rutstein (Rutstein, Berenberg, *et al.*, 1976) recommended monitoring the occurrence of several highly preventable conditions to indicate severe problems with the quality of medical care. An efficient approach to assessing equity in the quality of care could be to have at least some routine data for ongoing quality assessment/monitoring collected in a way that differentiates more and less advantaged social groups.

As discussed above, considerations of quality entered into the recommendations of indicators for monitoring health care resource allocation. Counting numbers of facilities and numbers of personnel without regard to the nature of the services provided, the capabilities of the facilities, and the qualifications of the personnel is likely to seriously underestimate inequity in most low- and middle-income countries today.

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#### IV. D. Selected analytic issues: additional comments

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This section discusses selected analytic issues regarding monitoring equity, including: **□ quantifying differences between groups**; **□ issues that arise in making comparisons among social groups defined according to different domains of equity/inequity (geography, gender, ethnicity, etc.); and □ additional analytic issues of recurrent concern in assessing equity, including □ the use of composite indices to reflect the magnitude of inequalities in health and □ assessing horizontal and vertical equity by describing patterns in social inequalities in health and health care.**

##### **□ Quantifying differences between groups**

To assess the magnitude of gaps between groups using relevant indicators, a few very basic and familiar analytic methods are suggested for comparing different social groups: *rate differences* and *rate ratios*; and, where appropriate, *absolute differences* and *relative ratios*. Rate differences and rate ratios are used to assess social disparities by comparing the *rates* of a given indicator in groups with different levels of social advantage. A rate difference would describe the size of the gap between one group and another in terms of the difference between the rates in the two groups assessed by subtracting one rate from the other; for example, a gap of 20 infant deaths per 1,000 live births between income quintile 5 (Q5, the richest) and income quintile 1 (Q1, the poorest). A rate ratio would examine the relative magnitude of two rates expressed as a proportion, by dividing the rate in one group by the rate in another, for example; the infant mortality rate in income Q5 is 50% of that in income Q1 (or, alternatively, the rate in Q1 is 200% or twice that in Q5).

For indicators expressed as absolute numbers, e.g., life expectancy or potential years of life lost, comparisons to assess social disparities in health would be made by examining the absolute differences (by subtraction) and relative ratios (by dividing the absolute number in one group by the absolute number in another group). For example, one could say that there is a 10-year gap in life expectancy between Q1 and Q5 (absolute difference) or that the life expectancy in Q5 is 1.25 times that in Q1 (relative ratio).

In each case, the statistical significance of observed differences should be assessed using standard methods, i.e., t-tests to assess the significance of differences between quantities expressed as absolute numbers and  $X^2$  tests to assess differences between proportions (ratios); consult any standard statistical reference. When population groups or subgroups are small or when the rate of occurrence of a given indicator is relatively low, differences between small numbers can reflect random variability and be misleading. In such cases it can be helpful to consider aggregating multiple years of data to achieve more stable estimates of absolute levels and the magnitude of gaps.

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**❑ Issues that arise in making comparisons among social groups defined according to different domains of equity/inequity (geography, gender, ethnicity, *etc.*)**

Assessing equity patterns requires making comparisons among social groups with different levels of social advantage. Comparisons among socioeconomic groups are essential to assess equity, but they are not the only comparisons that are needed. Other important comparisons include:

➤ **Comparisons between different geographic areas.** In general, geographic groupings should be defined to describe the smallest area possible given (a) the available information for the indicators being compared and (b) the need to have sufficient numbers of people in each geographic area to be able to make reliable comparisons between the areas and within an area over time. When one is able to disaggregate data using geographic areas that are small enough so that people living within them are relatively homogeneous socioeconomically, the geographic location itself becomes a useful marker of socioeconomic status; as noted above, such measures are often called “micro-geographic” markers.

➤ **Comparisons between males and females.** Some health indicators that are relevant to other equity concerns may not be helpful for assessing gender equity. For example, comparing rates of low birth weight among male and female infants is not useful in itself as a reflection of gender equity, while comparing rates of undernutrition or poor growth, or rates of immunization coverage, for example, among boys and girls would be useful.

➤ **Comparisons between different ethnic or religious groups.** There is particular danger of misleading inferences when making ethnic comparisons. Many observed differences in health and health care between ethnic groups are more related to socioeconomic factors than to intrinsic “cultural” differences; furthermore, race- or ethnic-specific data are often used to make inferences about underlying biological differences that are not supported by scientific evidence. Such inferences can provide a rationale for not taking measures to reduce observed health or health care disparities among ethnic groups.

➤ **Other comparisons to assess equity.** Other comparisons can reflect important concerns about equity in a given setting. These include comparisons between: people with and without health insurance; people in different occupations; different age groups (children, non-elderly adults, and the elderly); and people with and without certain socially stigmatized diseases or disabilities.

It may be important to compare groups defined by more than one type of characteristic. Looking at only one dimension of inequity at a time can understate the degree of disadvantage that many people face, because multiple dimensions of inequity often coexist and interact with

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each other. For example, disabled people in rural areas, poor women who are members of an ethnic minority, or poor elderly people suffer multiple disadvantages that could damage their health in many ways. In practice, it often will be difficult to obtain routine data permitting ongoing monitoring of differences between groups defined by multiple characteristics. However, this issue should be kept in mind when interpreting policy implications of observed disparities.

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**The table of indicators, data sources, and comparisons at the end of this document suggests a number of comparisons between social groups that may be useful for describing patterns of social inequalities in health and its determinants using selected indicators.**

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#### **□ Additional analytic issues of recurrent concern in assessing equity**

Four additional analytic issues are mentioned here: □ the need to reassess data quality during the process of analysis; □ comparing the social groups at the extremes of advantage and disadvantage, versus including comparisons with groups at intermediate levels of disadvantage; □ composite indices of equity; and □ horizontal versus vertical equity.

□ **Data quality.** The process of analyzing and presenting information on patterns and trends in equity should include a careful re-assessment of whether the data are reliable enough to yield valid, useful information on the issues under consideration. Although assessment of the quality of the data on a given indicator should have been a key consideration in selecting data sources and indicators, one may become more fully aware of potential data quality problems during data analysis. For example, results that are not biologically plausible, or results that are highly inconsistent when one uses different alternative measures, should raise questions about potential problems with data quality.

□ **Comparing the extremes only versus examining how the groups in the middle are doing.** A major area of discussion among researchers working in the field of measuring socioeconomic inequalities in health is concern about what information is lost when one only makes comparisons between two groups that represent the extremes (e.g., the top and bottom income quintiles), leaving out information on the groups in the middle (the second, third, and fourth income quintiles). Marked gradients in health outcomes such as mortality have been observed when populations are divided into several socioeconomic groups. For some indicators, however, it is possible that there may be a “threshold” effect, with middle groups at a degree of disadvantage that is fairly similar to that of the lowest- or the highest-risk group rather than intermediate between them.

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**❑ A recurring methodologic issue: the use of composite indices to reflect the magnitude of inequalities in health**

Because of the limitations of simple analytic comparisons for assessing equity in health (e.g., the desire to include information on how groups in between the extremes are doing, mentioned above), a number of researchers have developed and assessed the utility of composite indices to measure health inequalities across all socioeconomic groups in a population and/or to reflect the relative sizes of the different socioeconomic groups. Composite indices (also referred to as “summary indices” because they “summarize” multiple measurements) that assess socioeconomic inequalities in health include: the Gini coefficient (and the related Lorenz curve); the Index of Dissimilarity (absolute and relative versions); the Relative Index of Inequality and the Slope (and Relative) Indices of Inequality; the Concentration Index; and the Population Attributable Risk (Etiologic Fraction) expressed as a proportion or an absolute number. The Population Attributable Risk could be used to give an estimate of the amount or proportion of disease or mortality in an entire population that would be eliminated if all groups experienced the same amount or rate of disease or mortality as the most socially advantaged group; this measure incorporates information both on the differences in rates of ill health between the most advantaged group and all other groups and on the relative sizes of the various groups.

Reviews of the advantages and disadvantages of different composite indices have been published by Mackenbach and Kunst (Mackenbach and Kunst, 1997) and Wagstaff, Paci, and Van Doorslaer (Wagstaff, Paci, *et al.*, 1991); researchers interested in using composite indices are referred to those sources. Based on those reviews it appears that, apart from the Population Attributable Risk (PAR), most composite indices have very serious limitations. For example, most are generally very difficult to understand or interpret, even by highly technical health professionals, and are unlikely to have intuitive meaning when presented outside very limited academic circles. Mackenbach and Kunst have noted that some of the composite measures “have a complex interpretation and easily lead to misunderstanding.”(Mackenbach and Kunst, 1997) In addition, the composite measures rely on a series of assumptions, each of which may be debated. Furthermore, a single summary measure combining multiple comparisons may be less useful to guide policy decisions than a series of separate measurements, performed with simple techniques, that permit consideration of specific issues. Kunst and Mackenbach themselves have recommended that researchers make multiple comparisons using simple methods (such as absolute differences and ratios, or rate differences and rate ratios) and rely on composite measures primarily to confirm or disconfirm the findings using the simpler measures; the results of the simpler analyses should be presented to the public and decision-makers. (Mackenbach and Kunst, 1997)

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**❑ Measuring patterns of social inequalities in health:  
composite indices versus multiple simple comparisons**

- ❑ For the purposes of ongoing policy-oriented monitoring, simple comparisons (e.g., rate ratios and rate differences, or absolute differences and ratios) are useful to assess health inequalities between different social groups. The meaning of these simple comparisons can be further explored by performing additional analyses: (a) using different ways of grouping the population; (b) comparing indicators across multiple subgroups in addition to the two groups representing the extremes of advantage and disadvantage; and (c) repeating comparisons using different indicators of health and health care. Complex composite indices may be useful to explore further and confirm or cast doubt on findings based on simple measures. Whenever possible, the simple comparisons, rather than the complex measurements used to confirm them, should be presented to the public and policy-makers.**
- ❑ Sound, rigorous research on social inequalities in health does not require an ability to use composite indices. Work with composite indices can be part of more complex methodologic research performed by specialized investigators who have the particular skills and training needed for this activity; the results of that research should be applied to help improve monitoring efforts in the future.**
- ❑ The Population Attributable Risk should probably be considered more often as a potential tool for assessing social inequalities in health; one of its advantages is that it may be more easily understood by lay audiences than other composite measures.**

**❑ Assessing horizontal and vertical equity by describing patterns in social inequalities in health and health care**

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“Horizontal equity” is defined as the allocation of equal or equivalent resources for equal need; that is, two individual with similar health problems should not receive different treatment because one has greater ability to pay. “ Vertical equity” refers to the allocation of different resources for different levels of need. See earlier comments on the difficulty of defining and measuring “need”. Vertical equity would require, for example, that a person with poorer health status and fewer economic resources receive different and probably greater health care resources than a more affluent person who has better health or who has more ability to purchase health care using personal funds. Vertical equity is often more controversial than horizontal equity.

Horizontal and vertical equity might be assessed as follows. Horizontal equity might be assessed by first showing the distribution among the populations living in different districts of selected indicators reflecting need, e.g., poverty levels, availability of safe water and sanitation, and rates of stunting among children. If neighbourhoods are small, it may be necessary to aggregate multiple years of data to achieve reliable estimates of differences between neighbourhoods. One could then describe a measure of health care resource allocation, e.g., the distribution of per capita public expenditures on health care among the different districts. Inequities would be indicated by a mismatch between need and resource allocation. Districts with similar levels of need (as reflected by health status and major determinants of health status) should have similar levels of resource allocation; horizontal inequity would be the absence of such parity. Vertical equity would require that the districts with higher levels of need receive higher levels of resource allocation.

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### Table of Selected Indicators, Data Sources and Comparisons to Monitor Equity in Health

**Abbreviations and terms:** **DHS** = Demographic and Health Surveys; **geographic area** = any subnational geographic territory, e.g., a province, district, neighborhood or village; **LSMS** = Living Standards Measurement Study surveys; **MCH** = maternal and child health including family planning; [?] denotes that the relevant data source may not be available at a given geographic level; “recommended” = consider first.

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| General type of indicator                             | Specific indicators and recommended comparisons   | Data sources   | Geographic levels at which the indicator may be measurable  | Rationale? Reflects policies in which sectors?   |
|---|---|--|---|--|
| <b>A. Health status indicators</b>                    |   |  |   |  |
| <b>A. 1. Children's growth and nutritional status</b> | <p>Low height-for-age (stunting) rate = % of children &lt; 5 years old with height-for-age &lt; 2 standard deviations below international norms is particularly recommended. Also useful: low weight-for-height (wasting), low weight-for-age (underweight), and, where relevant, obesity.</p> <ul style="list-style-type: none"> <li>✓ Nationally, compare socioeconomic groups, girls and boys, ethnic groups, other social groups if relevant</li> <li>✓ Compare geographic areas within the country</li> <li>✓ Within a geographic area, if data sources and numbers permit, compare socioeconomic groups, girls and boys, ethnic groups, other social groups</li> </ul> <p>☞ Socioeconomic information is in DHS and should be added to all monitoring systems and surveys</p> | <p><i>Recommended:</i></p> <ul style="list-style-type: none"> <li>✓ Ongoing household surveys (e.g., DHS or national MCH surveys)</li> <li>✓ Routine community-based monitoring systems (if representative)</li> </ul> <p><i>Alternate:</i></p> <ul style="list-style-type: none"> <li>✓ Community surveys using rapid assessment methods</li> </ul> | <ul style="list-style-type: none"> <li>· rural: urban</li> <li>· province</li> <li>· district (DHS [?], MCH surveys, community surveys, community-based monitoring systems)</li> <li>· sub-district [?]</li> </ul> <p>(community surveys or community-based monitoring systems)</p> | <p>Stunting and wasting reflect chronic and acute malnutrition, respectively. Low weight-for-age can be harder to interpret. Obesity reflects parents' education. Malnutrition reflects impacts of: macro-economic, agriculture, nutrition, &amp; education sectors; comparatively minor role for health</p> |

### Table of Selected Indicators, Data Sources and Comparisons to Monitor Equity in Health

**Abbreviations and terms:** **DHS** = Demographic and Health Surveys; **geographic area** = any subnational geographic territory, e.g., a province, district, neighborhood or village; **LSMS** = Living Standards Measurement Study surveys; **MCH** = maternal and child health including family planning; [?] denotes that the relevant data source may not be available at a given geographic level; “recommended” = consider first.

| General type of indicator              | Specific indicators and recommended comparisons  | Data sources  | Geographic levels at which the indicator may be measurable   | Rationale? Reflects policies in which sectors?  |
|--|--|---|--|---|
| <b>A. 2. Child (under-5) mortality</b> | <p>Under-five child mortality rate = the number of children who die before reaching their 5th birthday divided by 1,000 live births; and if possible, separate components of child mortality (see below)</p> <ul style="list-style-type: none"> <li>✓ Nationally, compare socioeconomic groups, girls and boys, ethnic groups, other social groups if relevant</li> <li>✓ Compare geographic areas within the country</li> <li>✓ Comparisons of groups within a geographic area may not be possible except perhaps in very large provinces</li> <li>☞ Where the quality of vital registration and numbers permit, also look at neonatal, postneonatal, infant, and 1-4 year-old mortality rates separately. Gender comparisons on postneonatal and 1-4-year-old mortality may be more meaningful than comparisons on neonatal or child/infant mortality overall</li> <li>☞ Changes needed in vital registration: add socioeconomic measures and report by residence of deceased, not where death occurred</li> </ul> | <p><i>Recommended:</i></p> <ul style="list-style-type: none"> <li>✓ DHS permits socioeconomic/ social comparisons at national and provincial levels. ✓ other MCH surveys</li> </ul> <p><i>Alternate:</i></p> <ul style="list-style-type: none"> <li>✓ Vital registration (doesn't permit subgroup comparisons unless information is added)</li> </ul> | <ul style="list-style-type: none"> <li>· province</li> <li>· rural: urban differences can only be distinguished if recorded by residence of deceased rather than occurrence of death which is often in an urban referral facility;</li> <li>· probably not feasible at district level</li> </ul> <p>☞ may need to combine 3 or more years of data for sufficient numbers</p> | <p>Macroeconomic and environmental policies, and all social sectors including health care. Neonatal mortality reflects health care more strongly than postneonatal or 1-4-year-old mortality, which more strongly reflect overall economic/environmental conditions</p> |

### Table of Selected Indicators, Data Sources and Comparisons to Monitor Equity in Health

**Abbreviations and terms:** **DHS** = Demographic and Health Surveys; **geographic area** = any subnational geographic territory, e.g., a province, district, neighborhood or village; **LSMS** = Living Standards Measurement Study surveys; **MCH** = maternal and child health including family planning; [?] denotes that the relevant data source may not be available at a given geographic level; “recommended” = consider first.

| General type of indicator    | Specific indicators and recommended comparisons  | Data sources   | Geographic levels at which the indicator may be measurable   | Rationale? Reflects policies in which sectors?  |
|------------------------------|--|--|--|---|
| <b>A. 3. Life expectancy</b> | <p>Life expectancy at birth (or at age 5); or related measures such as Potential Years of Life Lost (PYLL).</p> <ul style="list-style-type: none"> <li>✓ Compare geographic areas (sex-specific life expectancy in area)</li> <li>✓ Nationally, compare women and men</li> <li>☞ Comparisons among socioeconomic (and other) groups are a high priority for future; this requires adding a socioeconomic measure, e.g., years of education (and measures identifying other social groups), to death certificates</li> <li>☞ If also monitoring child or infant mortality, recommend using life expectancy at age 5, or premature mortality among adults, (vs. life expectancy at birth) to avoid redundancy</li> <li>☞ Other life expectancy indicators to consider: Measures combining disability/suffering with mortality would be ideal but will not be feasible in most settings. The % of all deaths (or of all adult deaths) occurring at ages &lt; 65, or the % of all deaths occurring at age &lt; 15, are rough indicators that are particularly simple to calculate and may be useful at times.</li> </ul> | <ul style="list-style-type: none"> <li>✓ Vital registration: ideally should be recorded by residence of deceased, not occurrence of death</li> </ul> | <ul style="list-style-type: none"> <li>· province</li> <li>· rural: urban differences can only be distinguished if deaths are registered by residence of deceased rather than occurrence, province</li> <li>· probably not feasible at district level</li> </ul> | <p>Macroeconomic, health care, education, overall social policies, and environmental policies. Shorter life expectancy of males may be avoidable with reduced occupational hazards, changes in societal expectations of males, and/or reduced exposures to alcohol or tobacco</p> |

### Table of Selected Indicators, Data Sources and Comparisons to Monitor Equity in Health

**Abbreviations and terms:** **DHS** = Demographic and Health Surveys; **geographic area** = any subnational geographic territory, e.g., a province, district, neighborhood or village; **LSMS** = Living Standards Measurement Study surveys; **MCH** = maternal and child health including family planning; [?] denotes that the relevant data source may not be available at a given geographic level; “recommended” = consider first.

| General type of indicator       | Specific indicators and recommended comparisons   | Data sources  | Geographic levels at which the indicator may be measurable  | Rationale? Reflects policies in which sectors?                           |
|---------------------------------|---|---|---|--|
| <b>A. 4. Maternal mortality</b> | <p>Maternal mortality ratio = number of deaths among women while pregnant or within 42 days of termination of pregnancy, per 100,000 live births</p> <p>✓ Compare maternal mortality ratios among different provinces; this will require multiple years of data in most countries</p> <p>☞ Note that reporting of maternal mortality is often very unreliable and subject to change. Maternal mortality ratios could appear to increase if a campaign improves the reporting of maternal deaths. So particular caution is advised when interpreting differences in maternal mortality between groups and over time</p> <p>☞ Comparing maternal mortality among different socioeconomic groups (or other social groups) would require adding socioeconomic information (and information identifying other social groups) to death certificates. This should be a high priority</p> | <p>✓ Vital registration: should be reported by locale of residence of deceased not occurrence of death; otherwise may be unable to distinguish rural from urban mortality</p> | <p>· province (multiple years)</p> <p>· rural: urban differences can only be distinguished if deaths are reported by residence of deceased (not by occurrence of death which is often in an urban referral facility)</p> <p>☞ often will need to combine 3 or more years of data for sufficient numbers</p> | <p>Health care, education, macroeconomic, and environmental policies</p> |

### Table of Selected Indicators, Data Sources and Comparisons to Monitor Equity in Health

**Abbreviations and terms:** **DHS** = Demographic and Health Surveys; **geographic area** = any subnational geographic territory, e.g., a province, district, neighborhood or village; **LSMS** = Living Standards Measurement Study surveys; **MCH** = maternal and child health including family planning; [?] denotes that the relevant data source may not be available at a given geographic level; “recommended” = consider first.

| General type of indicator  | Specific indicators and recommended comparisons   | Data sources   | Geographic levels at which the indicator may be measurable  | Rationale? Reflects policies in which sectors?   |
|--|---|--|---|--|
| <b>A. 5. Chronic non-infectious disease (for example, as reflected by tobacco use, a major modifiable risk factor)</b> | <p>Tobacco use rate = % of persons aged 15 and older using tobacco (any form, any quantity/frequency)</p> <ul style="list-style-type: none"> <li>✓ Nationally, compare socioeconomic groups (and other social groups, e.g., ethnic groups, if relevant)</li> <li>✓ Compare geographic areas</li> <li>☞ If available in population-based data, consider measures of disability, including disability due to mental health problems. In countries with household examination surveys, could also measure prevalence of uncontrolled hypertension and/or uncontrolled diabetes. Note that facility-based data on morbidity are usually not an acceptable data source to assess equity because they exclude people who don't receive services and they under-represent under-users.</li> <li>☞ High priority to develop methods for assessing disability, including disability due to mental health problems</li> </ul> | <ul style="list-style-type: none"> <li>✓ Community surveys using rapid assessment methods</li> <li>☞ Note that facility-based data only give numbers of visits for a given disease or condition, not the numbers of individuals who have these conditions</li> </ul> | <ul style="list-style-type: none"> <li>· rural: urban</li> <li>· province</li> <li>· district</li> <li>· sub-district</li> </ul>  | <p>Education sector; laws on tobacco advertising; health care (to a lesser extent)</p> <ul style="list-style-type: none"> <li>☞ Globally, tobacco use is a major cause of avoidable chronic disease</li> <li>☞ Social disparities in tobacco use can reflect the extent to which health promotion efforts are reaching different groups</li> </ul> |
| <b>A. 6. Other mortality measures that may be useful to assess equity when reliable data are available</b>             | <ul style="list-style-type: none"> <li>☞ The following measures of the proportion of mortality due to highly preventable causes could be useful if cause-of-death data are of sufficient quality (see also options to consider under A.3.):</li> <li>✓ Proportion of deaths due to injuries (accidents or violence)</li> <li>✓ Proportion of deaths due to communicable diseases</li> <li>✓ Proportion of deaths due to maternal, perinatal, or nutritional causes</li> <li>✓ Proportion of deaths due to any of the above causes (use this grouped indicator when numbers are insufficient for any 1 cause)</li> <li>☞ See suggested comparisons and comments under A.3.</li> <li>☞ Also consider: mortality due to cancer of the uterine cervix</li> </ul>  | <ul style="list-style-type: none"> <li>✓ Vital registration: ideally should be recorded by residence of deceased, not occurrence of death</li> </ul>   | <ul style="list-style-type: none"> <li>· rural: urban</li> <li>· province</li> <li>· unlikely to be feasible at district or sub-district levels unless very large populations</li> <li>☞ may need to combine 3 or more years of data for sufficient numbers in any 1 mortality group</li> </ul> | <p>Each broad category of preventable mortality reflects the roles of multiple sectors in addition to health care. Cervical cancer mortality strongly reflects health care because it is highly preventable with timely screening and treatment.</p>   |

| General type of indicator                                     | Specific indicators and recommended comparisons  | Data sources  | Geographic levels at which the indicator may be measurable   | Rationale? Reflects policies in which sectors? |
|---|--|---|--|--|
| <b>B. Major determinants of health apart from health care</b> |  |   |  |  |
| <b>B. 1. Safe water and sanitation</b>                        | <p>Ideally, measure the % of households with <u>both</u> clean water and <u>and</u> adequate sanitation according to national norms (e.g., clean water within 100m and adequate sanitary facilities within 10m of household) May be necessary to examine safe water and sanitation separately.</p> <ul style="list-style-type: none"> <li>✓ Compare geographic areas (down to the smallest area possible).</li> <li>✓ Compare socioeconomic or other social groups if data sources permit and if this comparison is helpful</li> </ul> | <p><i>Recommended:</i></p> <ul style="list-style-type: none"> <li>✓ Census</li> <li>✓ Routine records of environmental sanitation inspectors</li> </ul> <p><i>Alternate:</i></p> <ul style="list-style-type: none"> <li>✓ Community surveys using rapid assessment methods</li> </ul> | <ul style="list-style-type: none"> <li>· rural: urban</li> <li>· province</li> <li>· district</li> <li>· sub-district</li> </ul> | Environmental and macroeconomic policies       |
| <b>B. 2. Food supply</b>                                      | <p>The % of the population group with an adequate nutritional intake (considering caloric and other requirements)</p> <ul style="list-style-type: none"> <li>✓ Compare geographic areas</li> <li>✓ Compare socioeconomic or other social groups if data sources permit and if comparison is helpful</li> </ul>   | <ul style="list-style-type: none"> <li>✓ Routine nutritional surveys, or may also be available in some living standards surveys. May be monitored by agriculture or commerce sectors</li> </ul>   | depends on data source   | Macroeconomic and agriculture/land policies    |

|   |   |   |  |  |
|---|---|---|--|--|
| <b>B. 3. Housing</b>  | <p>% of households with adequate housing conditions according to national norms (e.g., not more than a specified number of persons per room; constructed of safe materials providing adequate shelter from cold, rain, heat, etc.)</p> <p>✓ Compare geographic areas<br/>         ✓ Compare socioeconomic or other social groups if data sources permit and if comparison is helpful</p>  | <p><i>Recommended:</i><br/>         ✓ Census<br/>         ✓ Routine records of housing inspectors</p> <p><i>Alternate:</i><br/>         ✓ Community surveys using rapid assessment methods</p>  | <ul style="list-style-type: none"> <li>· rural: urban</li> <li>· province</li> <li>· district,</li> <li>· sub-district</li> </ul>    | <p>Macroeconomic, environmental, and housing policies</p>  |
| <b>General type of indicator</b>  | <b>Specific indicators and recommended comparisons</b>  | <b>Data sources</b>   | <b>Geographic levels at which the indicator may be measurable</b>  | <b>Rationale? Reflects policies in which sectors?</b>  |
| <b>B. 4. Poverty (based on income, expenditures, consumption, or economic assets)</b> | <p>The % of households who are very poor, poor, and nonpoor according to specified absolute standards for subsistence, and measured using household income, expenditures, consumption, or economic assets.</p> <p>✓ Compare geographic areas, female- versus male-headed households, ethnic groups and other relevant groups. Note: this indicator will not be used to assess disparities between socioeconomic groups categorized according to poverty levels, because that would be tautological.</p> | <p><i>Recommended:</i><br/>         ✓ Census (or inter-census estimates)<br/>         ✓ Periodic poverty assessments by any social/economic sector or agency</p> <p><i>Alternate:</i><br/>         ✓ Community surveys using rapid assessment methods</p> | <ul style="list-style-type: none"> <li>· rural: urban</li> <li>· province</li> <li>· district</li> <li>· sub-district [?]</li> </ul> | <p>Most directly reflects effects of macroeconomic policies. Costs of health care are a major cause of impoverishment of households in many countries.</p> |

|                                  |   |   |  |   |
|----------------------------------|---|---|--|---|
| <b>B. 5.<br/>Education</b>       | <p>Educational attainment (years or level of formal schooling completed). E.g., the proportion of the population with (a) no formal schooling or incomplete primary level, (b) primary level completed with or without incomplete secondary schooling, or (c) secondary level or higher level completed. Or other groupings, using number of years or levels/categories. Information on literacy also is useful as a supplement, and may be used if information is unavailable on years of schooling.</p> <p>✓ Compare geographic areas, female- versus male-headed households, ethnic groups and others as relevant. Note: this indicator will not be used to assess disparities between socioeconomic groups who are defined according to educational attainment, because that would be tautological.</p> | <p><i>Recommended:</i></p> <ul style="list-style-type: none"> <li>✓ Census (or inter-census estimates)</li> <li>✓ Periodic poverty assessments by any social/economic sector or agency</li> </ul> <p><i>Alternate:</i></p> <ul style="list-style-type: none"> <li>✓ Community surveys using rapid assessment methods</li> </ul> | <ul style="list-style-type: none"> <li>· rural: urban</li> <li>· province</li> <li>· district</li> <li>· sub-district [?]</li> </ul> | <p>Reflects policies on education and also strongly reflects macroeconomic and general social policies, since one of the prime obstacles to formal schooling is poverty (even when tuition, books, uniforms, and transportation are free, school attendance is associated with the household's loss of the child's labor)</p> |
| <b>General type of indicator</b> | <b>Specific indicators and recommended comparisons</b>  | <b>Data sources</b>   | <b>Geographic levels at which the indicator may be measurable</b>  | <b>Rationale?<br/>Reflects policies in which sectors?</b>   |

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| <b>B. 6. Income inequality in the society</b>              | <p>The proportion of total income earned by the highest income quintile divided by the proportion of total income earned by the lowest income quintile.</p> <p>✓ Examine time trends in income inequality at the national level; also may be relevant to examine at provincial or district levels (making comparisons between geographic territories and over time) where permitted by data sources and by population numbers.</p>  | <p><i>Recommended:</i></p> <ul style="list-style-type: none"> <li>✓ Census (or inter-census estimates)</li> <li>✓ Periodic poverty assessments by any social/economic sector or agency</li> </ul> <p><i>Alternate:</i></p> <ul style="list-style-type: none"> <li>✓ Community surveys using rapid assessment methods</li> </ul> | <ul style="list-style-type: none"> <li>· national</li> <li>· province [?]</li> <li>· district [?]</li> <li>· probably not suitable at sub-district level</li> </ul> | <p>Reflects macroeconomic policies and general social policies. This indicator is suggested because of increasing evidence of an independent association between income inequality and mortality, even after controlling for many potentially confounding factors</p> |
| <b>General type of indicator</b>                           | <b>Specific indicators and recommended comparisons</b>  | <b>Data sources</b>   | <b>Geographic levels at which the indicator may be measurable</b>   | <b>Rationale? Reflects policies in which sectors?</b>   |
| <b>C. Health care financing and resource allocation</b>    |   |   |   |   |
| <b>C. 1. Households' burden of payment for health care</b> | <p>The average monthly expenditures for health care by households (in a given group or area) as a % of the same households' average monthly total expenditures (or total non-food expenditures)</p> <ul style="list-style-type: none"> <li>✓ Nationally, compare socioeconomic groups, female- versus male-headed households, and other social groups if relevant</li> <li>✓ Compare geographic areas</li> </ul> <p>☞ Note: In some countries, whether or not a person or family has health insurance may be a helpful proxy for the burden of payment for health care, especially if actual expenditure data are unavailable</p> | <p><i>Recommended:</i></p> <ul style="list-style-type: none"> <li>✓ Ongoing household surveys on living standards/ expenditures, e.g., LSMS</li> </ul> <p><i>Alternate:</i></p> <ul style="list-style-type: none"> <li>✓ Community surveys using rapid</li> </ul>   | <ul style="list-style-type: none"> <li>· rural: urban</li> <li>· province</li> <li>· district [?]</li> </ul>  | <p>Health care financing policies. The burden of payment for health care often impoverishes households</p>  |

| General type of indicator                        | Specific indicators and recommended comparisons   | Data sources   | Geographic levels at which the indicator may be measurable                      | Rationale? Reflects policies in which sectors?   |
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| <b>C. 2. Public expenditures for health care</b> | <p>Per capita total public expenditures on health care including expenditures for personnel, supplies, equipment, and facilities</p> <p>✓ Compare geographic areas</p> <p>☞ Note: ideally one would also want to have information from the private sector, including non-governmental organizations, and to examine public, private, and total expenditures; but information on private sector often unavailable.</p>   | <p>assessment methods</p> <p>✓ Routine health sector information</p> | <p>· rural: urban</p> <p>· province</p> <p>· district</p> <p>· sub-district</p> | <p>Within provinces and districts, it will be difficult to assess the extent to which expenditures for referral facilities benefit a larger catchment population versus only people nearby. See indicator D.4.</p> |
| <b>C. 3. Qualified health care personnel</b>     | <p>The ratio of the number of persons per the number of full-time active qualified health-care personnel in public sector in different categories (e.g., medical doctors, professional nurses, mental health professionals, pharmacists, midwives, medical assistants, auxiliary nurses, mental health technicians, pharmacy assistants). (Alternatively, one may prefer to use the number of personnel per capita) ☞ Do not count unfilled posts; add up part-time posts to calculate full-time “equivalents”. For example, 10 doctors who each work ½ day per week = 1 full-time-equivalent doctor.</p> <p>✓ Compare geographic areas</p> <p>☞ Note: ideally examine public sector, private sector, and total personnel, but private sector information often unavailable</p> | <p>✓ Routine health sector information</p>                           | <p>· rural: urban</p> <p>· province</p> <p>· district</p> <p>· sub-district</p> | <p>Health care policies. Within provinces and districts, it will be difficult to assess the extent to which personnel serve a larger catchment population versus people nearby. See indicator D.4.</p>             |

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| <b>C. 4.<br/>Geographic<br/>distribution of<br/>primary,<br/>secondary,<br/>and referral<br/>facilities</b> | <p>The ratio of the number of persons per the number of primary, secondary, and referral facilities per capita, in a given geographic territory; alternatively, one may prefer to use the per capita number of facilities. In some settings it may be worthwhile also to monitor the following but a survey is required: % of the population in a given geographic territory who must travel more than a specified time or distance (according to national norms) to reach the nearest primary, secondary, and referral facilities; time needed to reach a site may be a better reflection of transportation difficulty than distance itself.</p> <p>✓ Compare geographic areas</p> <p>☞ Note: ideally examine public, private, and total facilities, but private sector information often unavailable</p> | <p>✓ Routine health sector information should describe geographic location of facilities; census data or inter-census estimates should give population denominator. Surveys would be needed to determine the % of the population who had to travel more than a specified time or distance.</p> | <ul style="list-style-type: none"> <li>· rural: urban</li> <li>· province</li> <li>· district</li> <li>· sub-district</li> </ul> | <p>Reflects health care policies. Transportation sector policies also will be a key factor in determining geographic access.</p> <p>Within provinces and districts, it will be difficult to assess the extent to which facilities serve a larger catchment population versus people nearby; see indicator D.4.</p> |
| <b>General type<br/>of indicator</b>  | <b>Specific indicators and recommended comparisons</b>   | <b>Data sources</b>  | <b>Geographic levels at<br/>which the indicator<br/>may be measurable</b>  | <b>Rationale?<br/>Reflects policies in<br/>which sectors?</b>  |
| <b>D. Health care utilization and quality: utilization/coverage</b>   |  |  |  |  |

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| <b>D. 1.<br/>Immunization coverage</b>  | <p>Immunization coverage of infants = % of all infants age 12-23 months who have received all the recommended immunizations for their age</p> <ul style="list-style-type: none"> <li>✓ Nationally, compare socioeconomic groups, girls and boys, other social groups</li> <li>✓ Compare geographic areas</li> <li>✓ Within geographic areas, compare socioeconomic, gender, and other social groups if helpful</li> </ul>   | <p><i>Recommended:</i></p> <ul style="list-style-type: none"> <li>✓ Ongoing household surveys (e.g., DHS or other MCH surveys)</li> </ul> <p><i>Alternate:</i></p> <ul style="list-style-type: none"> <li>✓ Routine community-based monitoring systems if representative</li> </ul>  | <ul style="list-style-type: none"> <li>· rural: urban</li> <li>· province</li> <li>· district [?]</li> <li>· potentially sub-district (if there are community-based monitoring systems)</li> </ul> | <p>Primarily health care, but also macroeconomic and education policies because these affect care-seeking</p> |
| <b>D. 2.<br/>Reproductive health care coverage:</b><br><br><b>(a) Antenatal care coverage</b><br><br><b>(b) Safe delivery coverage</b><br><br><b>(c) Contraceptive prevalence</b> | <p>Each indicator below should be specified further according to national norms and compared:</p> <ul style="list-style-type: none"> <li>✓ Nationally among socioeconomic groups (and among other social groups if relevant); and</li> <li>✓ among different geographic areas.</li> </ul> <p>(a) % of live births for which the mother received adequate antenatal care</p> <p>(b) % of live births attended by a trained attendant (or occurring in a qualified health care institution)</p> <p>(c) % of sexually active women aged 15-49 who are using a modern contraceptive method in the recommended way</p> | <p><i>Recommended:</i></p> <ul style="list-style-type: none"> <li>✓ DHS or similar ongoing MCH surveys</li> </ul> <p><i>Alternate:</i></p> <ul style="list-style-type: none"> <li>✓ Community surveys using rapid assessment methods</li> </ul> <p>☞ DHS has socioeconomic information; socioeconomic information should be added to MCH surveys if not already included</p> | <ul style="list-style-type: none"> <li>· rural: urban</li> <li>· province</li> <li>· district [?]</li> </ul>   | <p>Primarily health care, but also macroeconomic and education policies because these affect care-seeking</p> |

| General type of indicator  | Specific indicators and recommended comparisons   | Data sources   | Geographic levels at which the indicator could be measured   | Rationale? Reflects policies in which sectors?   |
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| <b>D. Health care utilization and quality</b>  |   |  |  |  |
| <b>D. 3. Quality of primary health care as reflected by the availability of essential drugs (or other specified and measurable quality criteria)</b> | <p>The % of primary health care facilities in the public sector that have all the essential drugs on a standard number of surveillance visits (or that meet other specified and measurable quality criteria)</p> <ul style="list-style-type: none"> <li>✓ Compare geographic areas</li> <li>☞ It may also be worthwhile to assess drug availability at secondary and/or tertiary facilities if this is a suspected equity concern</li> <li>☞ Other quality indicators chosen according to local concerns should also be considered, e.g., % of primary health care facilities with adequate water, sanitation, and communications equipment; % of secondary facilities with adequate diagnostic and treatment resources including equipment and supplies</li> </ul> | ✓ Routine quality monitoring by health care sector   | <ul style="list-style-type: none"> <li>· rural: urban</li> <li>· province</li> <li>· district</li> <li>· sub-district</li> </ul>                       | <p>Health care.</p> <p>☞ The availability of essential drugs is a basic requirement and may be more feasible to measure than other aspects of quality.</p> |
| <b>D. 4. Access to health care referral services</b>   | <ul style="list-style-type: none"> <li>✓ Nationally, and in each geographic area, compare the % of attenders at a representative sample of public sector referral facilities (secondary, tertiary, or quaternary care) who are in the lower socioeconomic groups, with the % of the catchment population who are in the lower socioeconomic groups</li> <li>✓ Similar comparisons should be made regarding people who live in remote geographic areas, or people in other disadvantaged social groups</li> </ul>  | ✓ Exit interviews with patients at a sample of facilities, using rapid assessment methods. Sampling may rely on sentinel sites | <ul style="list-style-type: none"> <li>· rural: urban</li> <li>· province</li> <li>· district</li> <li>· sub-district (in a large district)</li> </ul> | <p>Health care; also education and transportation policies, which influence care-seeking</p>   |

