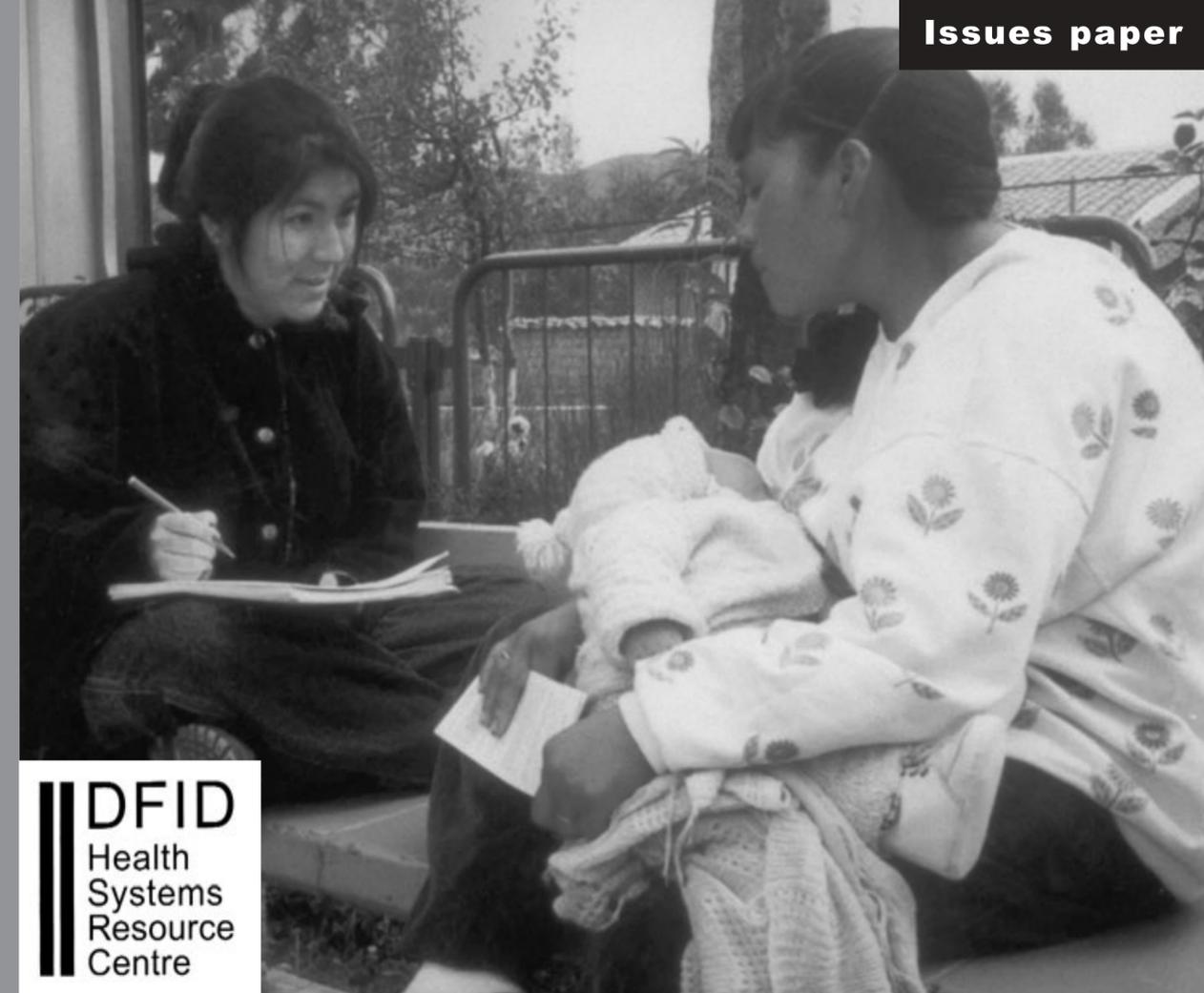


The ability to measure the health of the poor is growing in importance. This is not only because health and its equitable distribution are worthy and agreed goals in themselves, but also due to increasing awareness of the crucial role that health plays in the production, and reduction, of poverty. Furthermore, the current impetus for developing poverty reduction strategies requires an effective 'pro-poor' monitoring and evaluation process at country level.

This paper reviews the range of tools used in collecting data on health and socioeconomic status. It argues that very few of these methods are capable of providing information about the health of the very poor. The authors outline a strategy for building on existing data sources, such as Demographic and Health Surveys, through designing supplementary studies and using techniques such as poverty mapping.



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Assessing the health of the poor: towards a pro-poor measurement strategy

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The DFID Health Systems Resource Centre (HSRC) provides technical assistance and information to the British Government's Department for International Development (DFID) and its partners in support of pro-poor health policies, financing and services. The HSRC is managed on behalf of DFID by the Institute of Health Sector Development (IHSI).

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Executive summary

The problems of measuring the health of the poor are now becoming a priority area for development agencies. This is not only because of the consensus on equitable health status as a worthy and agreed goal in itself, but also because of the emerging understanding of the crucial role that health plays in the production of poverty. Furthermore, the current impetus for preparing Poverty Reduction Strategy Papers (PRSPs) requires an effective monitoring and evaluation process to be planned as part of each country's strategy.

Much data on the health of the world's poor is already collected on a regular basis in developing countries by the Demographic and Health Survey (DHS) programme. More information on the economic status of individuals in developing countries is also collected, less frequently and with less standardised questionnaires, by the World Bank under the Living Standards Measurement Survey (LSMS) programme. Other data on both health and income or wealth is also available from a range of uncoordinated sources. So far, the only focused attempt to measure the health of the poor uses DHS data to track health indicators for different 'wealth' groups, where wealth is measured by calculating household assets and amenities. Using DHS data as the main strategy for measuring health is the best way forward, given that it is the highest quality and most standardised scheme of data collection. The DHS is very unlikely, however, to include income in its questionnaire schedule, so that general agreement needs to be reached on the asset approach as an appropriate way forward, the alternative being a consistent set of health questions being included in LSMS surveys.

Apart from undertaking analyses of data which has already been collected, there should also be supplementary data collection undertaken to cover the shortcomings of the DHS in any given setting. According to the country characteristics in any given setting, the following range of techniques should be considered to supplement DHS and LSMS monitoring: poverty mapping from the most recent census; piggybacking poverty studies on already functioning population 'laboratories'; and undertaking new cluster surveys in new poor areas. It is also advisable to engage in a dialogue for undertaking new standardised surveys in-country such as DHS and LSMS. The latter is particularly amenable to flexibility of subject matter to be included in the questionnaire.



1 Introduction

Improving the health of the world's poor is increasingly an explicit objective expressed by the international development community. A number of major organisations in the health field, including the Department for International Development (DFID), now have the improvement of health outcomes for the world's poor, or the elimination of poverty, as their primary aim (Wagstaff, 2000). This is in recognition not only of the developmental importance of equity in health (following on from the Alma Ata ideal of 'Health for All') but also of the role of ill health in the production of poverty. Thus, raising the incomes of the poor may not be enough to reduce poverty if health and mortality are not also improved. A growing consensus has established that the 'vicious' cycle of poverty and ill health links the two outcomes inextricably (DFID, 2000).

More focused initiatives are therefore being requested which are 'pro poor', to address the health needs of the 'excluded billion' (DFID, 2000) or the poorest quintile of the world's population (Gwatkin et al, 2000). There are also calls for attention to be focused on the 1.3 billion that live on 'less than \$1 per day' (DFID, 2000). However, to address the needs of these people, it is necessary to measure accurately their levels of morbidity, mortality, and related health behaviours and service uptake. More specifically, the indicators that measure progress towards the International Development Targets (IDTs) must cover the poor end of wealth distribution. This paper argues that very little is known about these outcomes for the poorest of the poor, both because our current survey instruments do not capture them, and because we do not know to what extent our surveys miss the poor.

The extent of our lack of knowledge concerning the health of the world's poor is not clear, but it is likely that there is a measurement problem using existing systems and approaches. Not only are our current tools uncoordinated and not purpose built, but also the underlying sampling frames on which they depend are often outdated and can be biased towards wealthier people. We therefore cannot build poverty reduction strategies without a more systematic approach to capturing the possible missing millions and their true health status, or making estimates of the proportion of poor people missed. Given the imminent production of PRSPs by low income countries, it is now timely to develop concomitant measurement initiatives, without which the reduction of poverty cannot be demonstrated.



2 Background

The World Bank has recently developed a framework to strengthen poverty reduction strategies in developing countries. This framework is 'based on the experience of many countries, cross-country analytical work and current best practice in development assistance, and consultations with other international organisations and NGO representatives' (World Bank, 2000). Three key steps underlie the new approach, all of which imply a strong measurement imperative. These are:

- understanding the nature and locus of poverty
- choosing public actions that have the highest poverty impact
- selecting and tracking outcome indicators

The framework, which is designed to help prioritize interventions at the country level according to their impact on poverty outcomes, is being applied to the development of PRSPs, which will form the basis for World Bank (IDA) and IMF concessional assistance to low-income countries, including debt relief under the Highly Indebted Poor Countries (HIPC) initiative. Initial efforts will focus on supporting the development of PRSPs in countries expected to be eligible for assistance under the HIPC initiative. At the same time, the new approach will be introduced in a phased manner in all low-income countries receiving concessional assistance from the World Bank and the IMF.

In the light of this new initiative and the increasing calls for a pro-poor approach to health and development, it should be a priority to upgrade systematically the evidence base in equitable health. This is necessary for the effective collection of data to compile national benchmarking indicators (especially those that have been designated for IDTs), as well as to monitor indicators over time and to evaluate interventions. Knowledge of health determinants would also be greatly enhanced by a new focus on improving the evidence base. Although many sources of data and effective instruments are already available, the imperative is now to build on and extend existing data collection systems, and to make the current instruments pro poor as well as investing in new designs to reach out to excluded peoples. The systematic application of qualitative methods is also required to provide explanations for routes to ill health among the poorest of the poor in a range of settings. Encompassing these elements of data collection, a comprehensive strategy is now required which can underpin the new development consensus on equitable health.

To advance the debate on how to build such a strategy, this paper aims to review the existing methods and sources available to measure the health problems of the poor, their access to services, spending on health and mortality differentials. These current sources are examined in terms of their usefulness for producing indicators for the

various aspects of health, for monitoring the impact of interventions and for policy making. Building on existing sources, recommendations are made to form part of a new strategy to improve the evidence base, including what might work in different settings. Measurement of the key aspects of health are examined first, including IDTs, mortality, morbidity across the lifecycle, knowledge and attitudes about health, access to health services and spending on health. This is followed by an assessment of the major existing instruments and systems for data collection including Demographic and Health Surveys, censuses, and Living Standards Measurement Surveys. The final sections address the problems of integrating existing systems into a new pro-poor evidence base, and set out a package of new methods which can be used effectively to tackle measurement in developing countries.



3 Why measure health indicators among the poor?

The rationale for measuring the health of the poor is the link between poverty and ill health. 'Out of pocket' health costs for serious and unexpected conditions can be devastating for families and individuals. In addition, the loss of earnings associated with ill health rapidly impoverishes households. Individual wealth trajectories can vary considerably over time as families fall into poverty and recover themselves again. However, the main thrust of recent initiatives to promote the health of the poor is based on concern over inequity; the injustice associated with inequalities in the health status of individuals and groups.

The measurement of these two aspects of the health of the poor implies different strategies. If we aim to take lower income groups and measure their health status, then we will require a poverty line below which the poor population can be included. This approach would lead to a different proportion of each country's population being counted and health indicators would be based on that subgroup. Selecting poor subgroups alone would surmount the problem of monitoring national IDTs, which do not clearly show the progression of the health of the poor (IDTs can be achieved without any change in the health status of the poor). The proportion of poor people is a poverty measure in itself, but comparing the health status of parallel subgroups in different countries would yield comparative indicators which could clearly show how well a country's poor were progressing. The measurement problems inherent in this strategy, however, are not trivial. The establishment of a poverty line that is comparable over countries is problematic, as is the measurement of household income in non-cash economies.

The alternative approach to measuring the health of the poor, which gives a measure of health inequalities, compares the health of the poorest with that of the richest in a country. Gwatkin et al (2000), in their recent publication of health inequality measures based on DHS data, follow this method, taking indicators for the highest and lowest wealth quintiles of each country's population. This measures wealth inequalities as well as comparative levels of health status; a less comprehensible indicator, but much easier to calculate.

The approach used by Gwatkin et al (2000) uses household assets as a proxy for wealth. Although unconventional in economic analyses, which have tended to define poverty in terms of income or consumption, the measurement of assets rather than income to capture wealth status is gaining ground in the international literature (see, for example, Morris et al, 1999). This may be expedient; the accurate measurement of

income through standardised household surveys is notoriously difficult, mainly because of the length of time necessary to interview individuals about all their sources of income, particularly in non-cash economies. Even when the data is carefully collected, there are often doubts about income data validity, and there is little time to ask additional detailed health questions in the same interview schedule. Some evidence shows that the consumption–asset relationship is close and that asset variability is more sensitive to development indicators such as education, and proponents argue that asset measurement is a good proxy for income and consumption (Filmer and Pritchett, 1998; Montgomery et al 1997; Wagstaff et al 1991).

However, the use of assets rather than income as a measure of poverty has several important implications. The most commonly used asset indices are derived from the DHS, and thus are confined to the types of assets recorded in these surveys. Also, an asset index defines poverty in purely economic terms, and does not take into account such factors as gender, education and ethnicity, and hence concentrates on only one aspect of the multi-dimensional concept of poverty. However, a similar problem is encountered if income or consumption is used as a measure of poverty.

The choice of the individual assets that compose an asset index must reflect the particular sociocultural environment to which the index will be applied. In creating an index it is possible that the complex context of household wealth and its regional and ethnic variations may be ignored, and a fixed set of variables is not necessarily adequate to measure wealth in all environments. Gwatkin et al (2000) suggest that the creation of an index that uses a fixed list of assets allows for inter-country comparisons, and is easy to compute as all DHS contain a standard list of assets. However, including all variables entails a lack of consideration of the differing significance of the ownership of some assets in differing environments. Indeed, Filmer and Pritchett (1998), in their analysis of DHS data from 35 countries, found that the number of assets needed to create an adequate index of wealth varied from 9 to 17, indicating that an index using a fixed set of assets may not be the most appropriate for inter-country comparisons of wealth.

However, the inclusion of publicly provided resources such as sanitation and water within an asset score can be difficult to defend as an indicator of private household wealth. If the aim of an index is to measure household wealth, then the inclusion of variables relating to the presence of publicly provided services brings into the index factors that are not a product of the financial status of the household. However, it is possible to use factors relating to the presence of publicly provided services to create measures of the average wealth for a given geographic area; for example, to indicate the wealth of people living within a primary sampling unit who share access to the same public services.

Even though an assets approach involves fewer methodological difficulties, there are still problems. The method relies on a 'principal components' technique that isolates clusters of assets that are often owned in common by households, and builds an ownership score based on these clusters. Rural and urban assets are treated in the same way, even though rural land and livestock holdings are not comparable to urban commodity goods (Kausar, Griffiths and Matthews, 1999). The standardised DHS survey which is used to calculate asset-based health inequality measures is, however, a valuable source from which to build internationally comparable indicators. Although the gold standard would be complete data on all cash and non-cash incomes for each household, there are at present many problems encountered when collecting such data. Hence, the use of an asset index, which is known to be highly correlated with both income and consumption, provides a valuable proxy for measuring household wealth.

A common feature of all these measurements is that they rely on surveys to capture nationally representative samples. The extent to which poor people are covered by surveys based on recent censuses is debatable. Furthermore, the effectiveness of survey instruments in collecting good quality information from very poor people is not documented. Poverty zones are usually well known to local authorities in developing countries. In rural areas they are specific industrial and agricultural areas, tribal and nomadic villages, and known marginal areas outside of villages. Urban areas include known poor populations such as pavement dwellers, and slum pockets or ghettos, especially those located far from amenities in environmentally compromised locations. Some studies have focused on poor areas such as these and health indicators have been estimated, although not in a coordinated way and sometimes with small sample sizes.

The measurements of poverty discussed so far have concentrated on economic poverty. Falkingham (1999) notes that this focus on economic poverty fails to capture other important aspects of an individual's wellbeing, such as community resources, security and the natural environment. In response to this, McKinley (1997) has suggested shifting towards measuring capability poverty, which incorporates access to public services, assets, employment and income poverty. Capability poverty can be measured directly in terms of capabilities themselves, e.g. the level of malnutrition in a population, or indirectly, in terms of access to education and public services. For example, in a study of child wellbeing in transitional economies, Falkingham (1999) examined the levels of infant mortality, low birth weight, school attendance and educational attainment in order to assess the degree of capability poverty among children.

4 Measuring health

The indicators chosen by international organisations to represent progress in the health of populations are usually similar to DFID's IDT indicators. The areas covered are infant and child mortality, maternal mortality, reproductive health and HIV. More specifically these are:

- the infant mortality rate
- the under-five mortality rate
- the maternal mortality rate
- births attended by skilled health personnel
- the contraceptive prevalence rate
- HIV prevalence in 15–24-year-old pregnant women.

(1997 White Paper on International Development)

Other miscellaneous indicators, e.g. life expectancy, nutritional status, education and poverty indicators, are also quoted by DFID, but not as core measures. The targets themselves take the indicators and set a level which they should attain by a particular date, as follows:

- to reduce by two thirds the rate of infant and child mortality by the year 2015
- to reduce by three quarters the rate of maternal mortality by 2015
- to attain universal access to reproductive health services before 2015
- to achieve a 25 percent reduction in HIV infection rates among 15–24 year olds in the worst-affected countries by 2005 and globally by 2010.

The World Bank (Health, Nutrition and Population division) has announced similar indicators to be monitored, but also includes:

- immunisation
- diarrhoea – prevalence and treatment
- acute respiratory infection
- antenatal care (percent of births with at least one prenatal care visit by a health professional OR two or more prenatal care consultations from a medically trained person)
- delivery attendance
- modern contraceptive prevalence
- knowledge of HIV/AIDS prevention.

The core measures of the IDTs concentrate predominantly on child mortality and maternal health, and, with the exception of the HIV prevalence rate, they ignore the burden of adult mortality. The targets themselves are aimed at reducing child mortality and improving maternal health. Some of the additional indices remedy this to some extent; for example, the inclusion of life expectancy at birth takes adult mortality into account. However, life expectancy remains heavily influenced by the level of infant and child mortality. This is particularly a problem in transitional countries which are currently experiencing high levels of adult mortality in their poorest subgroups. In order to measure the health of the poor adequately in such settings, steps should be taken to include adult mortality in the overall measurement strategy.

All of the indicators listed above, excluding HIV infection rates, can be calculated from DHS surveys. Estimates of mortality rates should also be calculable from a combination of vital registration and census data, although the coverage of vital registration in most developing countries is far from universal, the poorest being the most likely not to be included in registration systems. Ministry of health information from countries themselves will also give calculations of these rates based on facility data collection. However, these often vary considerably from the DHS estimates and are unreliable. Maternal mortality can be estimated indirectly via the sisterhood method from DHS data, but DHS themselves have a rule that maternal mortality should not be measured more often than once in 10 years in any particular country. HIV among pregnant women can only be measured in antenatal clinics within surveillance systems in-country.

The maternal mortality ratio (MMR) is the most frequently cited indicator of maternal health because of the insights that the level of maternal mortality are thought to reveal about the conditions of women's lives. The WHO describes maternal mortality as the 'litmus test of the status of women' (WHO, 1996) and is also variously used as an indicator of poverty, equity, health system functioning, development and the general reproductive health status of a population. However, it is well documented that the death of a woman in pregnancy or childbirth remains one of the most difficult events to identify (Graham and Campbell, 1990). Identification relies on accurate classification and recording of maternal death, which depends on the quality, competence and willingness of medical staff to classify and record a death when and if identified. The inclusion of abortion-related mortality (estimated as 20 percent of global maternal mortality), which is less likely to be reported, exacerbates this problem. One obvious difficulty associated with a mortality of this kind is that the woman does not survive the event to report it herself. After her death, the break up of the family makes it difficult to trace her death, and the sisterhood method (where women, and sometimes men, are asked about the survivorship of their siblings) tends to overestimate the number of deaths through potential multiple reporting of the same event. The measurement of a relatively rare event is always problematic. While in total numbers there are many hundreds of thousands of women annually dying in tragic circumstances, when we compare this number to the total numbers at risk, the numbers of deaths make less of an impact. This is not to trivialise the enormous impact of a maternal death. But in statistical terms it is

very expensive to survey sufficient numbers in order to identify enough maternal deaths from which to calculate a meaningful MMR with reasonable confidence. For example, Maine et al (WHO 1987) calculate that to estimate a maternal mortality ratio of 500 per 100,000 live births a survey would need to cover an area with a population of half-a-million people to identify only 88 deaths in one year.

The measurement of near-miss maternal mortality, which tracks life-threatening obstetric episodes, offers some important possibilities for replacing or at least supplementing the MMR (Hulton et al, 1999). This becomes particularly useful when maternal mortality begins to decline and mortality measurement becomes increasingly difficult. The calculation of near-miss morbidity rates has a number of other advantages. First, women are alive to report the event and its longer-term consequences, and thus measuring near-misses tells us about the health of the living population. Secondly, the tracking of near-miss episodes also encourages the development of maternity information systems in hospitals, which improve efficiency and quality of care in maternity services. However, some problems do remain in the calculation of near-miss indicators, and more studies are needed to refine these indicators further. Medical expert opinion varies considerably as to what constitutes a severe morbid outcome in obstetrics, and various definitions have been used, mainly employing a retrospective study design through the use of case notes (Stewart and Festin, 1995; Ronsmans et al., 1997; Seoane et al., 1998).

Health and morbidity throughout the lifecycle are, however, also difficult to measure, and data are not routinely collected. Self-reported morbidity has some well known problems (see, for example, Fortney and Smith, 1999) when compared with medically specified illness, particularly in the context of some morbidities such as maternal ill health (Ronsmans, 1995). Furthermore, the reporting of ill health is almost always affected by socioeconomic status, such that highly educated groups are likely to articulate their own health status more effectively and more frequently than others. Hospital-reported morbidity, which is not reliant on lay perceptions of ill health, is also flawed, as those who eventually turn up at hospital are a socioeconomically select group.

Given the desirability of moving away from mortality-based indicators as measures of health status, the estimation of disease burden via Disability Adjusted Life Years (DALYs) (Murray et al 1996) offers a promising alternative. The rationale behind this approach, developed by the World Bank and WHO in 1993, emphasises priority setting by selecting health interventions that give the best value for money. The DALY is a single, comparable measure of health outcome designed to quantify both premature mortality and disability from groups of diseases at all ages. More specifically, it is a discounted and age-weighted composite indicator of the future stream of life lost due to premature deaths added to the future stream of healthy life foregone due to disabilities caused by disease. Having calculated DALYs lost from a disease or group of diseases, cost effectiveness is then measured in terms of cost of interventions 'per DALY saved'.

The calculation of life years lost due to mortality from disease is reasonably straightforward to calculate through the use of cause-specific mortality rates and subsequent comparison with 'ideal' life table rates, such as would be found in modern-day Japan. However, the cause-specific mortality data necessary for the calculation can be very hard to obtain in developing countries due to scarce death certification and the lack of good medical officers for cause attribution. The calculation of the magnitude of disabilities is even more problematic. DALYs lost through life lived with a disability are calculated by experts who estimate the incidence of disease, the age of onset, and the duration of disability for each specific disease derived from community-based data, health facility data or expert judgement. Disability weights are also applied. These are based on subjective opinions of disease experts using person trade-off methods, which determine the proportion of a year of healthy life deemed 'lost' in the presence of disabling disease. This calculation has been provided by wealth group by the WHO (2000), which demonstrates that the indicator can be used to show health inequality in a country. When disaggregated by wealth group, the mortality of children plays a large part in the calculations, as poorer children are more likely to die of infectious disease, immunisable disease and malnutrition.

Measuring access to services gives as an indicator of health status the ability to seek care rather than the eventual health outcome. In terms of reproductive health services, these types of indicators are very popular especially for measuring access to antenatal care. DHS surveys have a long experience of capturing such data. Another intermediate indicator is also the amount of money that an individual or family spends on health care. This will include public and private health care use, establishing access and including hidden costs. Some LSMSs have collected such information, but again the instruments suffer from long interview times. A final type of indicator includes individual attitudes and knowledge of health issues. Many knowledge, attitudes and practice (KAP) surveys have tried to capture this aspect of health, and effective questions have been framed. The DHS include some questions of this type.

Health can be measured from the supply side as well as from the demand side. Measuring the quality of the health systems provided can give a good indicator of the health of a population. However, there are obvious measurement problems associated with focussing on service provision. The WHO (2000) suggest 'responsiveness' as a measure of quality, including elements of respect for clients and client orientation. Analysts have aided the process of such measurements by creating frameworks of quality which break down quality of care into a discrete number of aspects (see, for example, Bruce, 1990 for family planning services; Hulton et al., 2000 for maternity care). However, as much of the experience of care is measured by clients' reports, a great deal depends on the questionnaire instruments and the environments in which clients are interviewed. (Exit interviews, for example, should be conducted in private with no health personnel present: even then the expectation of quality in services varies enormously between groups). Constructing indicators for the provision, rather than the experience, of care has been initiated by the 'situation analyses' conducted by the

Population Council, and these are currently being followed up by Service Provision Assessments (SPAs), which evaluate health facilities in great detail. Many aspects of provision can be measured, including levels of drug stocks, numbers of staff, qualifications and opening hours. However, technical competence of medical staff is more difficult to capture.



5 Existing sources of data

Routine data collection covering entire national populations has formed the backbone of population information in developing countries. Regular censuses are carried out in most countries, and vital registration systems, although sometimes covering only a small proportion of the population, are in place. In addition, three internationally supported standardised household survey programmes have contributed immensely to knowledge of health conditions, particularly those of children, in the developing world over the last three decades. These are the World Fertility Survey programme, the DHS programme and the LSMS. These programmes, along with other significant existing sources of data, are described below with particular reference to their capacity to measure the health status of the poor.

5.1 Censuses

This important source of data underpins the calculation of vital demographic rates such as fertility and mortality measures. Census data are also extremely important in the design of large-scale nationally representative surveys. Censuses in developing countries are now usually carried out regularly, and quality is improving. However, there is a variability of quality over countries, and even over time (some censuses are known to have been conducted well – this is usually locally known). To ascertain quality, most countries also operate a post-enumeration check. Some developing countries have a very long history of census taking (e.g. India, whose first census was conducted in 1871, and censuses have been carried out every 10 years subsequently). Others do not: Ethiopia was one of the last countries to adopt a census and Chad is the only remaining sizeable country without a census. The advantages of a census for pro-poor measurement are obvious; no sampling frame is used – the whole population is intended to be included. However, the amount of questions asked is normally minimal, and very few health indicators can be constructed, although it is possible to use indirect calculation methods to calculate early mortality indices from census data.

5.2 Vital registration

Vital registration is less reliable in developing countries. These systems often cover a very small proportion of the population (sometimes as little as 10 percent), even if it is against the law not to register births and deaths. In most rural areas of developing countries, there is little incentive to register, and systems are not in place to issue death and birth certificates. The situation also runs counter to covering poor populations, as normally poor people do not benefit from registering births; this is usually the preserve of richer, urban groups.

5.3 Demographic and Health Surveys and World Fertility Surveys

The DHS programme is run by Macro/ORC International with support from the United States Agency for International Development (USAID). This programme was initiated in 1985 and built on the experience of the preceding 43 World Fertility Surveys (WFS) operated from 1974 in a range of developing countries and funded by both USAID and the United Nations Population Fund. The DHS surveys are large scale, usually nationally representative, household surveys carried out using trained interviewers administering the survey instrument face to face at periodic intervals in approximately 50 countries across Asia, Africa, the Arab world, Latin America and the former Soviet Union. In each country the DHS programme collects information about a large number of health, nutrition, population and health service utilisation measures, as well as data on individual respondents' demographic, social and economic characteristics. The respondents selected from the sampled households are normally women of childbearing age, although partners of those women from within the same households are also sampled in some surveys (e.g. Zambia, Kenya and Uganda). The information is collected through a standard set of questionnaires that are similar in all countries and include questions about the respondent's household and community, as well as questions relating to the individual herself.

The DHS programme was initially launched as a follow-on from the WFS series, as a wide range of interest groups, including governments and international organisations, saw the information and indicators to be valuable. The programme is now in its fourth round, the latest round being the first under the new MEASURE consortium project. USAID is the largest funder of surveys, but, typically, there will be a consortium of donor agencies (including governments themselves) funding any particular survey, up to a maximum of eight funders. UNFPA and UNICEF are prominent among these agencies, especially when the country concerned is not a USAID-sanctioned country, in which case USAID will not participate. The DHS programme now aims to conduct a major survey in each of its covered countries every five years (a few interim surveys are also conducted). Every four years, there is a conscious effort to revamp and update the contents of the questionnaires, whilst retaining important indicators that have been found to have been useful over time. The core of the questionnaire is reckoned to be optimum if the interview time taken is at a maximum of 30 minutes, adding successive modules, which can take the total interview time up to 45–60 minutes in total. A typical initiation of the process of conducting a DHS survey includes an initial country visit to engage USAID missions and/or other major interested organisations, followed by a long series of meetings including all major stakeholders in which the content of the questionnaires is agreed. In the case of the recent Indian survey (the Indian National Family Health Survey), this process took 15 large meetings.

In DHS surveys, socioeconomic status is defined in terms of assets or wealth rather than in terms of income or consumption. The asset information is gathered through the

DHS household questionnaire, which includes questions, typically posed to the head of each surveyed household, concerning the household's ownership of consumer items. These goods range from a fan to a television or car, as well as dwelling characteristics such as floor material, type of drinking water source and toilet facilities used, and other characteristics that are related to wealth status. Questions on income have consistently been resisted by the DHS programme. In the occasional survey where it has been included, there have been doubts about the resultant data reliability. The main objection to the inclusion of economic information is the length of time taken in the interview to capture effectively income in all of its manifestations. It is estimated that a minimum of 15 minutes is required, which would add too much time to the total interview time. The assets approach is being defended by DHS as an adequate indicator of wealth, which correlates more strongly with health and educational variables than income. As part of their defence of pro-poor measurement, the DHS has recently targeted slum pockets explicitly in their designs, as in the 1998/99 India survey, where the three major cities included sizeable slum populations.

5.4 Living Standards Measurement Surveys

Neither the DHS nor the WFS have collected detailed economic information on households and communities. The World Bank's LSMS was designed to fill this need by studying the determinants and interactions of poverty, health, education, nutrition and labour activities. Since 1980 the surveys have collected a wealth of information about incomes, production and prices. Some LSMSs are funded through World Bank-financed projects, but many have received grant support from a variety of bilateral donors, the UNDP and other agencies. The programme has covered 21 countries, with nine of these having repeat surveys in their countries.

The LSMS conducts nationwide surveys that provide measurement of a broad range of social variables, such as employment, education etc., of which health is only one. The resulting data allow analysts to evaluate current living standards and track changes over time, which provide the basis for policy input. The first survey in a country typically requires, from the time it is commissioned to preliminary analysis of the compiled data, between 18 and 36 months and from US\$500,000 to US\$1,000,000. To obtain meaningful information about changes in household welfare over time, surveys are often repeated periodically; costs for subsequent surveys may be half those of the initial survey. Countries that commission LSMSs often do so as part of a broader effort to analyse poverty alleviation measures, and pay for the surveys with funds obtained through a World Bank loan or bilateral aid.

In terms of coverage of the poor, these surveys have the same set of problems as the DHS programme, as the frames on which they are based are constructed using census data in the same way. However, as the programme is less well established and the instruments are less standardised than the DHS, there is more of a question of poor quality associated with these surveys. Despite capturing economic and poverty variables

in full, they usually include only a few additional questions on health (although a few LSMSs do include a birth history, from which infant mortality can be calculated). Other aspects of development, including education, employment etc. are also covered. The DHS exclusively covers health, and there are other standardised surveys that aim to collect data on education or access to water. Any new strategies developed for the collection of data to measure the health of the poor must also have implications for the collection of data associated with other aspects of development.

The time required to conduct a typical LSMS is 21–46 months including a planning stage of 6–18 months, a fieldwork stage of 12 months and the first results after an additional 3–6 months. While the periodic collection of indicators is necessary, some users have also found the need for a poverty monitoring survey instrument with a short turnaround time. In Ghana the introduction of the Core Welfare Indicators Questionnaire (CWIK) provided a tool for the rapid collection of key welfare indicators, measuring access, utilisation and satisfaction for a select number of social and economic services.

5.5 Center for Disease Control surveys

The Center for Disease Control (CDC) based in Atlanta, USA, has recently carried out a series of nationally representative, health-related surveys in a range of countries, including some in Latin America, the Caribbean, Central and Eastern Europe and former Soviet countries. These are focused on reproductive health, and the programme has recently been linked to the DHS programme under the MEASURE initiative. There are four types of survey currently in operation. These are: reproductive health surveys (women of reproductive age); male reproductive health surveys; young adult reproductive health surveys (15–24 years); and reproductive health programme evaluation surveys. In terms of quality and pro-poor orientation, these surveys can be considered to have similar characteristics to those under the DHS programme.

5.6 UNICEF multi-indicator cluster surveys

These surveys are now carried out in many developing countries to allow UNICEF to calculate its development indices, particularly those published each year in its main publications 'State of the World's Children' and, more recently, 'Progress of Nations'. They are nationally representative, but have a very different design to DHS-style surveys. Although also mainly targeting women (and sometimes children themselves), the designs are cluster-based, with quotas to sample within each cluster. There are no callbacks to randomly selected households, as women are asked to participate and those who are difficult to obtain as participants are abandoned until the quota is reached. As such, the design may be biased towards those who have time to respond. The quality of these surveys is variable, although some are collected to a high standard. Availability of the data is not always easy, however, as, unlike the DHS data, there is no centralised website through which permission for use can be granted and data can be downloaded.

5.7 Population 'laboratories'

Population 'laboratories' have a long tradition in some developing countries and do well at tracking health variables over time. These take the form of panel surveys in which the same individuals are followed over successive survey rounds. The surveys are conducted within a specific geographic area and incorporate surveys and the continual surveillance of demographic events within households. The programmes are mainly operated in rural areas, as health problems have been seen as mainly rural until recently. With the realisation that urbanisation is now bringing us large pockets of poverty in all of the main urban conglomerations, the focus has shifted a little to urban areas.

These longitudinal studies provide an opportunity for tracking households during wealthy and lean periods in their evolution. Also, long-term health variables can be tracked over time, and childhood mortality rates can be accurately followed. These surveillance systems usually involve an initial baseline survey, followed up by interviews at regular intervals and checkups to keep track of additional births and deaths within families. The cost of the studies is very high, but their ability to provide a mechanism with which to evaluate interventions is very powerful. The following studies provide a selection of those currently operating in developing countries.

MATLAB. Matlab is a field station in Chandpur district, northeast of Dhaka in Bangladesh, where the International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR) has operated a longitudinal demographic surveillance system with monthly data collection since 1966. ICDDR has a hospital and a clinical and pathological laboratory in addition to its administration in the capital city. The coverage is 212,000 persons, and the initiative is one of the largest and earliest surveillance systems. The total cost has been approximately US\$200 million over the last three decades.

NAVRONGO HEALTH RESEARCH CENTRE. This project is based on the MATLAB initiative and was set up in 1993 by the Rockefeller Foundation in Kassena-Nankana district, in the upper eastern region of Ghana. The data is collected quarterly for most variables and the surveillance area covers 139,000 people.

HLABISA AFRICA CENTRE. Funded by the Wellcome Trust, this is a more recent initiative set up in 1999 in Mpukunyoni tribal area in Hlabisa district, Kwazulu-Natal Province, South Africa. A population of 75,000 people is tracked using quarterly questionnaires and a sophisticated database system.

AGINCOURT HEALTH AND POPULATION PROGRAMME. Also in South Africa, this demographic surveillance system covers a population of 63,000 people in Bushbuckridge region, Northern Province. Data on migrations and household relationships, as well as basic demographic information, have been collected annually since 1992.

There are a number of other such programmes, mainly based in Africa, and these are now coordinated by INDEPTH, which is Rockefeller funded. The organisation's website holds a database of 21 demographic surveillance systems which are full members of INDEPTH. Many other field sites are also documented by INDEPTH as associate members, potential studies or other demographic surveillance sites known to INDEPTH. Again, there is a predominance of such schemes in Africa, where many small schemes exist. The studies are overwhelmingly rural, covering rural poor populations, but the coverage of urban poor pockets is being initiated by the African Population and Health Research Centre. This is a Nairobi-based urban poor surveillance system that was launched in 1999. Additional urban information could be gleaned from existing sample registration systems, which are more common in Asia. The most famous of these is the Indian sample registration system (SRS). Although not a laboratory, this nationally representative sample is followed to estimate vital demographic rates, as vital registration is very poor. The survey employs surveillance in the same way as a population 'laboratory', and the quality is checked via a dual entry system. Potentially, such surveys are very useful data resources.

5.8 Other sample surveys

Many countries have their own national surveys that vary in quality. For example, India has a National Sample Survey which is run every year which does include some health variables. These are usually operated by the ministry of health in-country, although other government agencies may run surveys with health variables included. If there is a known, regularly conducted and high quality survey in any country, this should be considered as a possible way to collect health and poverty information.

5.9 Small area studies

Small area studies are conducted in most developing countries by a range of researchers. These are usually focused on a particular area of health and involve only a small sample (usually 300–2000, with various sampling designs and of varying quality). As the studies have a range of aims, they are uncoordinated and can usually only influence policy in small areas. Where there have been small studies in known poor areas, the results could be useful as a starting point for new initiatives to measure health in marginalised communities.

5.10 Facility surveys

As discussed above, information about selected health facilities in developing countries is available from the Population Council's 'situation analysis' programme, and more recently from MEASURE Evaluations' SPA surveys. The latter investigations are linked to DHS data collection by selecting facilities adjacent to enumeration areas and clusters from the DHS surveys. These data are potentially a very powerful tool for assessing the link between health service supply and demand. However, there are only a few countries

which have so far been covered, and the programme does not attract funders in the same way as the mainstream DHS surveys.

5.11 Market research studies

Some good field forces in developing countries can be found in the market research sector. For example, NIGERBUS now operates national health knowledge surveys in four sub-Saharan African countries, including questions on AIDS and condom use. However, these do have a low quality sampling design, and health questions are added to a survey which is essentially about marketing products. Despite this, they are repeated at regular intervals, costs are very low, and the capability on the ground is well developed.

5.12 Qualitative approaches

Qualitative methods are increasingly becoming recognised as an effective way to explain survey results or to pilot and develop survey instruments. Studies which include techniques such as focus group discussions, in-depth interviews, narrative methods and key informant interviews are essential in order to contextualise and give social meaning to calculated indicators. However, the methods are time consuming, especially in terms of analysis. To maximise their explanatory power, the methods can be tied into the survey cluster area such that outlying or surprising survey results can be explored in more depth (see, for example, Amin et al, 2000 for a good example of this approach).

5.13 Summary of main data sources

Type of data	Users	Advantages	Disadvantages	Suitability for measuring the health of the poor
Census	host government	<ul style="list-style-type: none"> ■ complete coverage 	<ul style="list-style-type: none"> ■ limited questions 	<ul style="list-style-type: none"> ■ aims to include all sectors of the population, but little health information included
	UN	<ul style="list-style-type: none"> ■ indirect calculation possible ■ post-enumeration checks available 	<ul style="list-style-type: none"> ■ can be prone to political influence ■ quality varies over time ■ boundary changes result in incomparable time series data 	<ul style="list-style-type: none"> ■ potential for creating poverty maps
Vital registration	host government	<ul style="list-style-type: none"> ■ calculation of vital rates (fertility and mortality) 	<ul style="list-style-type: none"> ■ very low coverage 	<ul style="list-style-type: none"> ■ biased towards high income groups
	UN	<ul style="list-style-type: none"> ■ good quality 		
DHS	host government	<ul style="list-style-type: none"> ■ long history of data collection 	<ul style="list-style-type: none"> ■ no direct collection of economic variables, e.g. income 	<ul style="list-style-type: none"> ■ asset approach doesn't necessarily capture household economics
	international agencies researchers NGOs	<ul style="list-style-type: none"> ■ standardised questionnaire ■ large range of health indicators, including IDTs ■ nationally representative ■ fast turnaround time ■ can track changes over time ■ nationally representative 	<ul style="list-style-type: none"> ■ sample frames don't necessarily cover poor ■ sample only includes women of childbearing age ■ does not include marginalised groups, e.g. pavement dwellers 	<ul style="list-style-type: none"> ■ covers a wide range of variables at individual, household and community levels ■ data easily accessible ■ measures of health inequalities have been developed (poverty quintiles)
LSMS	World Bank	<ul style="list-style-type: none"> ■ detailed information on household economics 	<ul style="list-style-type: none"> ■ sample frames don't necessarily cover poor 	<ul style="list-style-type: none"> ■ possible to investigate interactions between poverty and other social variables, including health
	host government researchers international agencies	<ul style="list-style-type: none"> ■ a broad range of social variables available 	<ul style="list-style-type: none"> ■ instruments are less standardised than DHS 	<ul style="list-style-type: none"> ■ limited health variables available (IDTs not included)

Type of data	Users	Advantages	Disadvantages	Suitability for measuring the health of the poor
		<ul style="list-style-type: none"> possibility for more flexibility in questionnaire content nationally representative 	<ul style="list-style-type: none"> long turnaround time less international coverage than DHS does not include marginalised groups, e.g. pavement dwellers 	
CDC	host government researchers international agencies	<ul style="list-style-type: none"> nationally representative special modules can be added to answer questions specific to the country 	<ul style="list-style-type: none"> focused only on reproductive health very limited international scope no direct collection of economic variables, e.g. income sample frames don't necessarily cover poor does not include marginalised groups, e.g. pavement dwellers 	<ul style="list-style-type: none"> useful only for measuring specifically reproductive health of poor populations questionnaire includes limited economic information (basic assets only)
UNICEF MICS	UNICEF international agencies	<ul style="list-style-type: none"> nationally representative can calculate development indices 	<ul style="list-style-type: none"> quota sampling variable quality do not include marginalised groups data not easily accessible 	<ul style="list-style-type: none"> internationally comparable indices only few indices can be calculated sampling unreliable and coverage of poor not known
Population laboratories	Researchers international agencies	<ul style="list-style-type: none"> long tradition of expertise wealth of data available can track variables over time possibility of adding new modules 	<ul style="list-style-type: none"> predominantly rural based very high cost geographically specific surveillance system creates synthetic environment 	<ul style="list-style-type: none"> within study areas, poor are included and carefully monitored useful methodology to supplement national surveys



6 Combining health and poverty measurement: the challenge

It is likely that very few of the currently operating surveys described above really capture the health of the very poor. Most of the surveys depend on the most recent census to provide the sampling frame, and this can be out of date, especially where poorer communities have grown up in a short time and established poor areas have become more prosperous. Censuses themselves give a more complete picture, although quality varies from country to country (and from census to census); the poor are the first to be missed in a low quality census. In terms of instruments for collecting health data, many good instruments exist, but none bring together all the aspects of health discussed above. Any new instruments developed for a specifically pro-poor measurement exercise could draw on the existing instruments to bring together a total health package. Care, however, should be exercised in piloting existing instruments in very poor communities, where survey questions that have worked elsewhere may not operate successfully among the very poor.

Strategies aimed at measuring the health of the poor need to be country specific. Therefore, as well as monitoring IDTs and internationally comparable poverty and health indicators, the entire socioeconomic range and distribution of poverty should be considered. This will involve the examination and use of all existing survey data as well as additional initiatives to establish the extent and diversity of poverty and the health of the poor in each country.

The DHSs represent the most consistent existing set of quality-monitored health data over a large range of developing countries. This provides a reliable core for the calculation of national and sometimes regional indices. However, the instrument does not include economic and poverty information such as income, which is more systematically collected in the LSMS family of surveys. Combining these elements would give a more satisfactory set of poverty data, as DHS indicators for the poor are currently built on household goods and amenities as a proxy for wealth. However, this would still not get over the problem of sampling bias towards the more prosperous.

In a few countries (Panama, Nicaragua, Ecuador), overcoming the wealth bias has been attempted by means of poverty maps. These aim to construct reliable measures of living standards by mapping LSMS survey data onto census data. Using a quantified relationship between income and household characteristics derived from the survey,

income is imputed for census respondents, thus arriving at a more complete and realistic income distribution than it was possible to obtain from the survey alone. The use of this technique assumes that the census penetrates into the poor communities more successfully than the survey, which is likely to be true in most settings. Regional allocation of resources has been the aim of poverty mapping thus far, although the technique could be adapted to determine which part of the income distribution of a country is represented in a DHS survey.

These and other techniques need to be developed to build a systematic pro-poor measurement strategy. Using existing sources must be a central tenet of the strategy, as this will maximise benefit. However, if this is the case, then pro-poor measurement will need to be considered country by country, as the existing sources in developing countries vary considerably in coverage, frequency and sample size as well as in quality. In addition, the understanding that underpins trends in the health of the poor should incorporate complementary qualitative techniques that focus on unusual or outlying results from surveys of poor people's health. This technique has been used very successfully with DHS data (see Amin et al., 2000), but pro-poor adaptations would need to be made to the approach.



7 Options for measuring the health of the poor using existing information

Data from population ‘laboratories’ such as Matlab and Agincourt are very expensive to generate, but have two important advantages. First, they are available and the data collection is ongoing, so that, in the countries where they are located, they should be investigated for their pro-poor potential. Second, they have a prospective ‘panel’ design, which means that the same households are followed up for a long period. The first of these advantages means that much information on health equity can be gathered cheaply, with marginal costs, in specific countries. It is not recommended that new laboratories be initiated as part of a measurement strategy for the poor. The second advantage, relating to panel designs, means that families can be followed up through periods of poverty and relative wellbeing, to track the dynamics of equity and health. Existing ‘laboratories’ should be investigated to see if the original design and sampling system was pro poor. If so, additional questions could be added, perhaps at a marginal cost, to obtain a very rich source of information about poverty and health. Where samples have used outdated census frames, and it is likely that poor households have been omitted, it is possible that purposively selected new poorer households could be added to the data collection system, also at marginal cost. In particular cases, such as the Nairobi surveillance system run by the African Population and Health Research Centre, the sample is already selected from very poor areas; in this case, data on poverty and health should be collected if it can be arranged with the study leaders.

As a separate but complementary technique, the idea of poverty mapping, as described above, could be adapted for the purposes of measuring the health of the poor. Where census information is recently available, and coincides roughly with a DHS survey, indicators of health and mortality derived from the survey (such as under-five mortality rates or uptake of antenatal care) can be mapped onto census populations using household type as the key. This means deriving a relationship between wealth (as defined by assets) and health from the survey and linking this with household type (e.g. head of household, household structure, educational level and location) also from the survey. As the distribution of basic household types is known from the census, each household’s health and wealth status can be ‘imputed’ using the relationship found in the survey. (Imputation is a method by which unknown variables not collected by the census can be ‘estimated’ given the information that is collected and the relationship between collected and required variables.)

This would reveal the extent of the mismatch between the sample survey and the census in terms of health outcomes. This calibration exercise would produce an indicator of health cut-off caused by the wealth bias of the survey, and would serve as a comparator between countries as well as a measure of quality and coverage for the DHS.

Using these two techniques, advances could be made in the quest to measure the health of the poor. Focused qualitative work could also enhance this work considerably. For example, carrying out focus group discussions and in-depth interviews in selected areas of the 'laboratory' region or in specially selected census enumeration areas would be a powerful approach. However, the problems of pro-wealthy sampling and lack of required information from censuses (as well as poorly executed censuses) can still be a problem in some regions. Existing data will not always be sufficient and a new data collection initiative is clearly a necessary part of any coherent pro-poor measurement strategy. This could effectively and cheaply take the form of panel surveys using a cluster design in known poor areas.



8 A new pro-poor measurement strategy using low cost evaluation techniques

Much good quality information about health status can be found from the DHS, which covers the mass of the populations in developing countries. This resource represents our most useful source of both comparative and in-depth country data from which to build indicators. Furthermore, most developing countries, and all priority countries have had at least one of these surveys. (It should be noted that Pakistan has only had one survey and this is one of the only DHS surveys that has serious quality problems.) DHS information should be seen as the starting point for measuring the health of the poor.

The basis of the DHS should be examined and the census gap considered. Poverty mapping should be conducted, if possible, to try to determine the extent to which the DHS has covered poor areas. If a survey with more economic variables, such as LSMS, is also available, this could be used further to enhance information about wealth distribution in the country. Depending on the mismatch between the DHS coverage and the known poor population, additional information could then be obtained by accessing and adding questions to existing population 'laboratories' or other sample surveys. In addition, further data can be collected in a special sample of poor areas by means of cost-effective new panel studies using a cluster design in known poor zones. Qualitative techniques can help to set the findings in context.

New data collection initiatives that cover the gap between existing sources and the reality of poor areas would be most effective if changes over time could be tracked. However, the full demographic surveillance systems included in population 'laboratories' are too expensive to be cost effective. More appropriate would be the approach taken by the occasional DHS (for example, Morocco), which goes back to the same clusters after an intervening period. The difficulty inherent in this strategy is finding a sampling frame for reference where the census may be out of date. If a poverty map has been possible, this can give a starting point for required sample sizes and poor regions, where the most recent DHS or LSMS has missed poor areas. Otherwise, knowledge of recently expanding urban poor areas or rapidly changing industrial or large-scale agricultural zones can be obtained from local authorities and census officers. Re-mapping of selected clusters would be essential at each survey round, as well as updating at subsequent rounds to include new clusters and to follow up on original clusters.

The table below shows countries that may benefit from variants of the pro-poor strategy.

DFID priority countries and their main recent sources of data			
Country	DHS and related surveys	LSMS	Census
Ghana	DHS: 1988, 1993, 1998 Special 1999	1988, 1989	1984, 2000
Nigeria	DHS: 1990, 1999		1991
Zimbabwe	DHS: 1994, 1998, 1999 Special 1999		1992
Zambia	DHS: 1990, 1992, 2000		1990
Malawi	DHS: 1992, 2000 KAP 1996 Special 1998		1998
Kenya	DHS: 1989, 1993, 1998 SPA 1999		1999
Tanzania	DHS: 1992, 1996, In-depth 1995 Interim 1999	National 1993 Kagera 1991	1998
Uganda	DHS: 1988, 1995, 2000 In-depth 1995		1991
Russia	Special 1999	1991, 1992 (CDC in 1996)	1989
Kazakhstan	DHS: 1995, 1999		1999
Kyrgyz Republic	DHS: 1997	1993	1989
Peru	DHS: 1986, 1992, 1996, 2000 In-depth 1993	1985, 1990, 1991, 1994	1993
Bolivia	DHS: 1989, 1994, 1997	1989 (5 rounds)	1992
Brazil	DHS: 1986, 1991, 1996	1997	1991
Nepal	DHS: 1996, 2000	1996	1991
India	DHS: 1993, 1999		1991
Bangladesh	DHS: 1994, 1997, 2000 SPA: 1999		1991
Pakistan	DHS: 1991	1991	1998
Cambodia	DHS: 2000 Special: 1998		1962
China		Hebei and Liaoning provinces: 1997	1990



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Annex 1 DHS technical details

Demographic and Health Surveys are based on a sample of census enumeration areas selected according to a multistage cluster design (this is a survey which selects a sample in successive stages: first, an area is chosen, within this an enumeration area, then households, and finally individuals are selected). In terms of sampling, the normal DHS procedure is quite rigorous. The target population is private households, excluding institutions and street dwellers. Slums are always included on the frame. After regional areas are agreed, smaller areas are chosen from each region based on a stratified list of the most recent census enumeration areas, stratification domains typically being based on urban/rural location, literacy, ecological zones etc. The number of areas selected is then based on the size of the strata, estimated by the totals produced by the most recent census (this is referred to as PPS sampling: probability proportional to size). Thus the multiple stages of the survey are typically:

- region within country (all regions selected), then
- stratified areas or clusters within each region (number of areas selected using PPS – the clusters are usually referred to as primary sampling units or PSUs), then
- households within clusters (systematically sampled, usually 1 in 25–30 households depending on total sample size and efficiencies required).

Finally, all eligible women (of childbearing age, usually defined as 13–45 years) are interviewed in each selected household. In those areas selected, a complete mapping and listing is carried out, so that outdated local frames from the previous census are superseded.

In many developing countries, this methodological approach was already in place, especially where WFSs had previously operated. As the predecessor of the DHS programme, the WFS laid down the foundation in terms of survey instruments as well as survey methodology. The core WFS questionnaire was primarily concerned with fertility and fertility-related behaviour; for each eligible woman it included a birth history, recording the date of each birth and, if the child had died, the age at death. This information base has provided much of what is known about child mortality trends and the relationships between child mortality and birth spacing, maternal education and household characteristics. The DHS questionnaire, in addition to a birth history, includes questions about immunisations, health care behaviour and other aspects of child health, as well as, in the most recent round, questions on women's reproductive health and domestic violence. It is now estimated that half of the questionnaire concerns health rather than fertility or background details, this proportion having risen substantially over the life of the programme.