

**Proceedings of the Workshop on  
Using Demographic and Health Survey (DHS) Data  
for Health Sector Reform**

**Harvard School of Public Health  
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**USING DEMOGRAPHIC AND HEALTH SURVEY DATA**  
**FOR HEALTH SECTOR REFORM**  
**HARVARD UNIVERSITY SCHOOL OF PUBLIC HEALTH**  
August 2-20, 1993

**EXECUTIVE SUMMARY**

This Workshop was based on a very simple idea - to present the two different viewpoints from which the assessment of a nation's public health can be considered. One, familiar to doctors and health professionals, uses the statistics generated from within the health sector, such as hospital records, data on clinic attenders, and doctors' records. Another perspective is provided by population-based studies, national household surveys, censuses and surveys (such as the DHS), which are generally conducted by demographers, statisticians and epidemiologists. The two groups of people generating and using these data rarely meet and do not often make use of each other's results. This Workshop made these connections between what we might refer to as the "medical" and the "demographic" views of public health by presenting a selection of topics under three general rubrics, each corresponding to a week of the Workshop.

Week 1:        How best can the health status of a population be assessed?

In the first week, the stress was on the assessment of health from a variety of data sources, both the routine data collected by most governments and other health providers on a regular basis, and the periodic cross-sectional surveys which are increasingly common around the world. Health is measured in a variety of ways, but in the first week, the focus was on mortality, recent self-reported morbidity, and nutritional status since these dimensions of health are assessed in both routine data sources and cross-sectional survey data.

Week 2:        How can we measure the contribution of the health sector, in addition to other factors, to the determination of the health status of the population?

In the second week, a different set of questions was asked. Here we are trying to measure the impact of the current set of health sector activities on public health. The question is more complex than it seems since historical as well as contemporary factors are involved. Some disease-specific interventions turn out to have synergistic effects on other causes of death and illness and the relations between intervention and impact are not always the same in different

environments. Issues of distribution and access cloud the purely epidemiological picture.

Week 3: Given some knowledge of the health status of the population and some understanding of how health is determined, how can health systems and the health sector in general be made more effective?

The third week suggested ways in which these assessments of the public health and the effect of current measures to improve health can be used for reform of the health sector. Many changes are being proposed in connection with health financing and the provision of health services.

The ultimate goal of the Workshop was to send participants home with a tangible agenda for research and action. This was achieved not by providing specific answers to every question posed but by the development of generic thinking about problems and their solution.

The participants were asked to complete an evaluation form at the end of the workshop to rate the quality of the program. Overall, the participants agreed that the workshop was excellent and 78% felt that it would help them in their job. They gave high marks for the range of topics covered and for the depth in which they were handled. One participant stated, "I particularly appreciated the broad range of issues which were combined during the workshop." The participants enjoyed the link between classroom and computer laboratory; "I find the workshop extremely useful for me! SPSS classes (were) great..." Some of the participants' suggestions for the future were follow-up by sending out literature and information to the participants, technical support from Harvard for participants' country projects, and organization of more DHS workshops.

oOo

## INTRODUCTION

Underlying this Workshop is a very simple idea. There are at least two different viewpoints from which the assessment of a nation's public health can be considered. One, familiar to doctors and health professionals, uses the statistics generated from within the health sector, such as hospital records, data on clinic attenders, and doctors' records. These data are rich and varied, serving many purposes, from patient management to the administrative control of the resources of the health sector. They provide detail on illness and health unavailable in alternative sources. Their main failing is that they necessarily refer only to that section of the population in contact with the formal health services. Another perspective is provided by population-based studies, national household surveys, censuses and surveys (such as the DHS), which are generally conducted by demographers, statisticians and epidemiologists. The strength of these data is their coverage: their weaknesses include their irregularity and their lack of details on medical aspects of health or on the workings of the health facilities.

The two groups of people generating and using these data rarely meet and do not often make use of each other's results. This Workshop will try to show the benefits which accrue when the two groups do meet and discuss their different views on the assessment of needs and the setting of priorities for reform of the health sector.

The Workshop will try to initiate this dialogue between what we might refer to as the "medical" and the "demographic" views of public health by presenting a selection of topics under three general rubrics, each corresponding to a week of the Workshop.

### Week 1:        How best can the health status of a population be assessed?

In this first week, we stress the assessment of health from a variety of data sources, both the routine data collected by most governments and other health providers on a regular basis, and the periodic cross-sectional surveys which are increasingly common around the world. Health is measured in a variety of ways, but in the first week we focus on mortality, recent self-reported morbidity, and nutritional status since these dimensions of health are assessed in both routine data sources and cross-sectional survey data. They are also the most frequently used measures of outputs from the health sector. Some common assumptions are challenged and some new methods of assessment and analysis are presented and illustrated with worked examples. During the first week, participants will begin their analysis of the Ghana DHS data which we will use throughout the Workshop. In addition, planning for the final report (see separate note) will also begin.

### Week 2:        How can we measure the contribution of the health sector, in addition to other factors, to the determination of the health status of the population?

In the second week, we pose a different set of questions. Here we are trying to measure the impact of the current set of health sector activities on public health. The question is more complex than it seems since historical as well as contemporary factors are involved. Some disease-specific interventions turn out to have synergistic effects on other causes of death and illness and the relations between intervention and impact are not always the same in different environments. Issues of distribution and access cloud the purely epidemiological picture.

Week 3: Given some knowledge of the health status of the population and some understanding of how health is determined, how can health systems and the health sector in general be made more effective?

The third week tries to suggest ways in which these assessments of the public health and the effect of current measures to improve health can be used for reform of the health sector. Many changes are being proposed in connection with health financing and the provision of health services. It is not clear whether such radical modifications of the workings of the health systems around the world will improve or endanger public health. Some tools for the comparing the effectiveness of different interventions as well as the methods recently adopted by the World Bank for comparing the impact of different diseases on disability-adjusted years lived.

The ultimate goal of the Workshop is to send participants home with a tangible agenda for research and action. The Workshop cannot produce answers to every question posed. We are more concerned to develop viable methods for the resolution of issues than to produce snap answers to particular problems.

Inevitably, participants will be leaving with the expectation that more work and study of the issues is necessary. In every case, some more detailed assessment of the state of health in each country will be needed before any reforms can be instituted. In addition, some evaluation of the effectiveness of the large matrix of public health interventions will also be a necessary precursor to action.

Finally, all reform involves politics but we hope to show that scientific information presented in digestible ways can have a considerable bearing on the direction of the political debate. Reforming the health sector of any country involves many different disciplines, skills and processes. This Workshop cannot be totally comprehensive but by selecting some key issues, we hope to provide a solid introduction to the main topics of dispute and to offer some guidelines on where to turn for advice on topics not covered in the Workshop agenda.

oOo

Allan G. Hill  
30 July 1993



## PROCEEDINGS

Monday 8/2

### Official Opening

Allan Hill introduced Dean Harvey Fineberg, who welcomed workshop participants on behalf of the School of Public Health. HF called attention to the universality of the aspiration for better health. The mission of Harvard School of Public Health is to marry the high ideals of students to the analytical foundation necessary for scientific progress. Moving from data to knowledge is a major challenge, and the theme of this workshop.

Lincoln Chen welcomed participants on behalf of the Department of Population Sciences and International Health. He gave a brief history of the department's origins in the merger of previous departments of Tropical Public Health and Population. This change was in recognition of the fact that today's global health problems transcend the 'we-they' distinction between regions that had become implicit in the Tropical Public Health viewpoint.

LC set out the basic background of Demographic and Health Surveys. They ask many of the same questions as the World Fertility Surveys that preceded them, but with the addition of a health component. Academics, analysts, and national ministries of health use them. They remain to be refined so as to supply better information to everyone who makes health decisions, including mothers, health workers, and district health officers.

Julia Walsh welcomed students on behalf of Data for Decision Making. The project's starting point is the recognition that much data exist, yet people do not use them to make decisions. DDM is based at Harvard and affiliated with the Research Triangle Institute, the Institute for Health Communication, and the CDC health analysis module.

JW suggested that the workshop should help participants to use data to meet the major challenges facing the health sector. These include affordable, efficient, high-quality services; meeting the changing health needs of communities; and sustaining gains in infant and child survival and family planning.

AH appealed for a collaborative approach between developed and developing countries. Each has much to learn from the other. When the workshop ends, participants should maintain contact with each other. Harvard also would like to stay in touch with them, in order to pursue common research interests. In addition, for those who wish to pursue further formal education, Harvard offers degrees and additional short courses.

## Allan Hill: Introduction to the workshop

AH observed that two separate views of health currently exist. One arises out of information gathered routinely by doctors and clinics about what happens to individual patients. This is the information decision makers in the health sector rely on most. The other optic on health derives from data that is produced by cross-sectional surveys and reflects what happens to whole populations. It thus includes some people may not appear in doctors' records--for example, the poor and those who live far from health services. While general in nature, this information is very valuable for some specific purposes, such as assessing the demand for health services.

The purpose of the workshop is to combine these two views into a maximally powerful and perspicacious view of health.

AH summarized the workshop syllabus. The first week will be devoted to the measurement of health status; the second to the assessment of health services, both formal or informal, to determine how well they are working and where improvements might be made; and the third to the use and presentation of data to change the way people organize and deliver health.

AH posed a hypothetical problem. Suppose your country has adopted a policy of giving more decision making responsibility to peripheral units. People at the local level don't know how to make a community health profile.

Ghana undertook such a decentralization of health services. Some people reported, anecdotally, that elderly people then started disappearing from polyclinics. When Ghana introduced user fees for health services, maternity services were said to collapse. Was it true? If so, why? These are some of the kinds of issues the workshop will equip participants to explore.

During the workshop, participants will produce a report based on data from the Ghana DHS survey. This should be a template for similar reports participants might generate in their own countries. It will specify the data needed to assess a question of interest and analyze the question as far as possible using the data at hand. At the end of the workshop, participants will present their reports together with policy recommendations based on their findings.

AH remarked that gathering data in itself can positively influence health. When midwives in the United Kingdom started visiting new mothers at home to weigh their children, the incidence of sudden infant death syndrome fell. Apparently, the midwives relayed a good deal of health information and confidence building while operating the scales.

Presentation is another important aspect of using data. It is more powerful to say that a woman in Gambia has a 1/17 chance of dying during her lifetime than to say that one maternal death occurs in every 1,000 births. Both statements represent the same arithmetic, but the former can influence people

to act.

AH introduced Robert Gardner, who has formatted the Ghana data for computer. RG will teach participants who don't already know how to use the computer program SPSS, and will assist in the computer analysis of the Ghana data. Nancy Pollock and Susan Yazdgerdi will provide additional computer expertise and assistance.

## **Tuesday 8/3**

Allan Hill: Measuring mortality when vital registration is inadequate

### 1. Mortality as an outcome measure.

The IMR and under-5 mortality rates, in particular, have both technical and political significance. UNICEF and other organizations use them as indices of overall health status in countries where most deaths occur among children. When presented in a comparative or rank-order way, they can catch the attention of the public and policy makers, and motivate action.

AH listed some basic strengths and weaknesses of mortality measures as summary health indicators. On the positive side, they are simple and unambiguous ("you're either alive or you're dead, there's not much in between"); they capture gross effects of social factors or public health interventions fairly well; when they are made age-specific, they can be used to make direct comparisons between populations. On the negative side, they are nonspecific as regards cause of death; seasonal and other factors typically cause them to fluctuate widely over the short term, rendering them clumsy tools for measuring the effects of programs and interventions that have not been in place for a long time.

AH invited the participants to add to the list.

--Paul: Mortality measures don't tell anything about the quality of life for survivors.

--Joyce: Noted that in many countries registration is poor. AH moved from this point to describe counterproductive features of some registration systems. Countries that delay routine birth registration until children enter school cannot use these data to measure child mortality, because the entire cohort of children who die before age 5 has already left the population before. Charging people for registration, or taking advantage of their presence to press for back taxes, is a deterrent and results in an undercount.

--Justin: Proposes that mortality is a better baseline measure than indicator of short-term change.

--Hussein: Where the composition of a population changes drastically--for instance, in a

squatter settlement or refugee camp--measured changes in mortality may be difficult to interpret.

--Paul: Social disruption and violence may inhibit data collection.

--Clifford: Before deciding whether or not to use data, one needs to consider the methodology used in collecting it.

AH summarized the point of the discussion as a need to be skeptical about the use of mortality data as a general indicator of health.

## 2. Models of mortality change

Using overhead projections of flow charts, AH recounted the evolution of theories of mortality causation in three stages from Malthus' crudely economic model, through Mosley and Chen's proximate determinants model (which incorporates such additional factors as environmental pollution and personal illness control), to Van Norren and Van Vianen's model. The advantage of the last lies in its orientation to communities rather than individuals. Typical community surveys directly supply all its data requirements and permit comparison between populations.

AH introduced the question of the relative effects of general infrastructural versus medical improvements on mortality. A graph shows that the bulk of mortality decline in industrialized nations began around 1910, coincident with public works projects to improve sanitation and water supplies, but previous to medical inroads against most major infectious diseases.

In a similar vein, a country whose average per capita income goes up almost always enjoys a rise in life expectancy, too. The magnitude of the increase in longevity depends in large measure on the baseline absolute income level. Poor countries whose economies improve a little can make big gains in average longevity, while wealthy nations whose economies expand the same amount are less likely to benefit as much. These relationships exist without reference to the health system or medical resources.

## 3. The standard measures of mortality

AH briefly reviewed the life-table measures of mortality, remarking that these will be covered in more detail as the workshop proceeds.

Death rates; translation of death rates into probabilities; probability of surviving as unity minus the probability of dying; life expectancy; cumulative probability of surviving. Life expectancy at birth is a standard tool for comparing mortality between populations.

Break

Workshop participants who volunteered Tuesday to chair project groups proposed objectives,

following which all participants affiliated with one group or another.

Paul, in charge of the 'inequities' team, would analyze how health care coverage and illness outcomes vary with age, gender, geographic location, socioeconomic characteristics, and a variety of other parameters. Giorgio suggested dividing the inquiry into three stages, to follow the trajectory of the workshop lectures, as follows: Week 1: Current health status; Week 2: Coverage/role of the health services; Week 3: How to improve the situation. Paul, Giorgio, Tabitha, and Riti comprise this group.

Joyce, chair of the 'health transition' team, would examine the trends in health service utilization and the prevalence of various diseases. She expressed doubts about being successful, given that the participants will be working with data from one single DHS survey. Giorgio suggested focusing on maternal-child health, since the DHS data is richest in this area. AH proposed treating data on rural mothers and children as baseline, and data on urban mothers and children as post-transition. This corresponds to reality in some degree, and while not entirely satisfactory, will permit the inquiry to go forward. Joyce, Boris, Luciano, and Komla comprise this group, whose title is changed to 'health problems and health services provision.'

Muna, point person of the 'contribution of the private sector to public health' group, would try to define the extent of use of private and public health services, the socioeconomic descriptors of the users of each, and the comparative quality of services. Muna, Kokou, Azra, and Reuben [the latter two volunteered in absentia] comprise this group.

Clifford, leader of the 'decentralization' group, would try to define the reasons why decision makers might want to shift some authority toward the peripheral components of the health care system; identify the data requirements and priorities for rationalizing and carrying out such a project; outline sources and methods for obtaining such data; and discuss ways to use data in advocating desirable changes. Clifford, Justin, Hussein, Koffi, and Sandra comprise this group.

AH asked each group to collectively prepare a paragraph outline of their aims and methods to give to him 8/4. It will help to divide the task into assessing current status, assessing current coverage, and identifying strategies for improvement.

AH introduced the DHS data from Ghana. Basic principle: A household survey is the ideal context for individual surveys (hence it is best if national censuses contain questions on fertility and mortality). For example, the Ghana census contained questions permitting indirect measurement of child mortality (by the surviving children method) and fertility. Although these vital rates are not age-specific and cannot be used to gauge short-term trends, they are reasonably accurate for 20 years back or so. An important advantage is that they can be used to tell whether the women interviewed in a follow-up individual survey are truly representative of the whole population of women.

AH made the point that details are important in the design and filling out of interview forms. As

an example, his experience has been that it's a good idea for interviewers to fill in the names of children first, then add the birth dates of children for whom there are corroborating documents such as vaccination cards, then put in the birth dates for other children. Looking at the documents may aid the interviewee's recall of the provenance of the undocumented.

--Hussein: How much can you rely on people's memory to be accurate, especially concerning births and deaths that happened long ago. AH elaborated this issue generally, and made the point that demographers have learned to recognize that approximate memory changes the straight line of constant fertility levels into a symmetrical bulge. The point is that good data interpretation gives due weight to factors influencing the data, such as memory.

AH explained that DHS files are arranged in a woman-based format and require reshaping into a birth-based format before mortality rates can be derived. (The participants will do this on computer.) This led into a general discussion of period versus cohort rates. Touching a main theme of the workshop, AH noted that medical studies tend to follow cohorts, while public health studies generally base mortality comparisons between populations on period rates. He noted that the 'baby boom' resulted from a combination of period and cohort effects: a large cohort of women all deciding to have more children at the same time.

Clifford reiterated the problem of deriving information about mortality change from general mortality surveys. AH offered, as a solution, converting cohort measures to period measures by reference to the year of birth. The limitation of this method is that it may be necessary to group several-year periods in order to have enough births to analyze in each.

AH described the most-recent birth technique of measuring early mortality. Merely by asking women who seek delivery services whether or not their previous child is still living, health care workers can closely estimate the probability of dying before age 2 in populations where the average birth interval is around 30 months. The method works almost as well when women are questioned at antenatal care visits, or at a child's first immunization.

The data derived from this technique give a good rolling picture of the progress of mortality, as opposed to the cross-sectional view provided by the DHS. They illustrate that women, not children, are the best targets for interventions to lower child mortality.

### **Wednesday 8/4**

Allan Hill: Health Interview Surveys: Methods and Results

Yesterday's discussion demonstrated problems and ambiguities in the use of mortality data, and

specifically of the type gathered in DHS data, to assess the overall health of a population. Perhaps differentials in morbidity data reflect health impacts more sensitively.

AH passed out four papers, addressing four core issues in the interpretation of morbidity data. The remainder of the lecture glossed the major points of these papers. 1. Riley reviews whether changes in morbidity parallel changes in mortality. Only developed countries have produced data that is copious and reliable enough to serve as the basis for examining this relationship. Two striking observations emerge:

a. Surveys that ask people about their health give very different impressions than tabulations of findings on actual random physical examinations. People report much less disease than physicians diagnose, perhaps because there is a tendency to report that one is in good health as long as one doesn't feel noticeably worse today than yesterday. Increasingly, surveys pose the question of health in terms of capacity or incapacity to perform various activities rather than asking about specific ailments. This functional approach should yield a measure of population health status that is more meaningful for policy making and more conducive to comparison between groups.

b. In Japan, the United States, and elsewhere, increases in life expectancy have been accompanied by steep rises in disease and injury. AH asks the participants whether this is a contradiction, or would they expect similar relationships in their own countries?

--Paul: Improved control of infectious disease means more chronic disease. In South Africa, this pattern is apparent in the contrasts between two sectors of the population. AH remarked that there is a middle ground, too: Some infectious diseases that are not prevented but do respond to treatment leave sequelae--for instance, measles damage to eyes.

AH defined prevalence as the product of incidence and duration. Because chronic disease lasts longer, a relative increase in chronic as opposed to acute illness produces higher prevalence. In addition, some interventions such as oral rehydration therapy for diarrhea may actually increase the incidence of acute disease, since more children survive to have recurrent episodes. Finally, the older the age distribution of a population, the more disease there is likely to be.

Summation: Numerous factors influence the results of surveys of morbidity. "The explanations are not altogether clear."

2. Murray and Chen's paper contains the perhaps surprising information that among US citizens over 45 years old, episodes of acute illness are more common in those with incomes above \$35K than those with lower incomes. How can we account for this?

--Clifford: It's selection bias. Wealthier people receive more diagnoses because they have more access to doctors.

AH: Along the same lines, the US has much higher rates of reported morbidity than India-- though it's difficult to believe that Americans are sicker than Indians.

--Clifford: Another mechanism of selection bias might be at work here. People in developing countries have less incentive to report illnesses because they've learned that the clinics often don't have the necessary knowledge and supplies to help them.

--Riti: Contrasting perceptions of illness figure here. Some conditions Americans call sickness may seem normal to Indians.

AH: New disease definitions can raise or lower morbidity.

--Peter: Raised the general issue of methodology, whether it is comparable in the US and India surveys being compared.

AH: Felt that methodological issues probably are not a problem in the present paper. Morbidity measurements can be subtly skewed by methodology, however. AH once participated in a survey in the flood zone of Mali that found unrealistically low malnutrition. The reason was that the data were gathered for a very heavy mortality population, and hence reflected a "healthy survivor" effect.

3. A paper on National Household Survey Capability Programs was discussed next.

Supposing the workshop participants would like to include a health component in their household surveys: How should they go about it? This paper, written for statisticians who had been collecting data on other subjects but needed to learn how to collect health data, warns of various pitfalls.

AH skimmed salient items from the table of contents, and commented: "These are boring but important technical questions that have to be faced when designing a survey." One very important consideration is the use of international standards for data collection and analysis. The interpretive problems discussed in the paper are real and vexing, but they should not stop people from going to the field to collect data.

4. Ross and Vaughan's paper asks the question: What have we learned from health interview surveys? AH called attention to a table summarizing 10 cross-sectional health interview surveys. Results of only a few can be compared because the questions and interview methodology were not standardized. Some kinds of questions can be standardized more readily than others. For example, the general question "Compared to a year ago, is your health better or worse or about the same?" automatically standardize for varying quotients of stoicism in different populations. In England, it also predicts attendance at clinics better than asking about health in more absolute terms, and is more useful for measuring short-term changes in morbidity.



Changing questions changes answers. You get different impressions of contraceptive use when you ask [as in the older DHS], "Have you ever used a modern contraceptive" and when you ask [as in the newer DHS], "Some people use various methods to avoid pregnancy. Have you heard of [name methods]? Have you used any of them? Are you currently using it?"

Although the DHS surveys were designed in large part to assess health behaviors and use of health services, they have not provided a very good reflection of this variable. The main reason has been noncomparability of data. When designing a DHS survey, it is important avoid elaborating too much on the standard questions.

AH recommended that the participants read the four papers as background for tomorrow's discussion of DHS surveys. He mentioned that DHS has fellowships for people to work in-house developing survey modules, and anyone who is interested should approach the DHS representatives who will attend later workshop sessions.

--Hussein: Questioned the usefulness of general morbidity data. What we really want to do is find out what are the most important diseases so we can attack them.

--Clifford: There's an inherent tension between the goal of comparability and that of isolating the important features of the local situation.

AH: Granted, it may be necessary to compromise between the goals of comparability and serviceability for local data users. The DHS did try to take this into account, so hopefully the compromise won't be too painful.

The inventors of "Disability-Adjusted Life Years" faced some of these questions very squarely when preparing Appendix B of the new World Development Report. In addition to attempting to put morbidity and mortality on the same scale, they created a unitary dimension on which the impact of having one disease could be directly compared to that of having any other. There's much room for discussion of their choices.

Michael Reich: Political Mapping Theory and Concepts

Today introduces the concepts and procedure of political mapping. Tomorrow MR will guide the participants in an example from Ghana. The objective is for workshop participants to be able to use the technique on their own.

How do participants define health sector reform?

--Clifford: Activities, improvement of health services --Koffi: Involves policy decisions --

Justin: Is directed to community health needs --Paul: Changes occur in power relations between providers and users, also among different provider groups --Joyce: Decentralization --Justin: Good planning is crucial --Giorgio: Affects intersectoral relationships (e.g. transport, education) to improve efficiency --Muna: Specific targets.

MR: Health sector reform is political. Why? It involves social and economic changes, taking from some people and giving to others. Providers may have to change their activities. The relationship between the private and public sectors may change. Reforms may affect election outcomes, or may be affected by the nearness of elections.

Ultimately, health sector reform is political because:

1. It depend on value systems. Utilitarian/consequentialists call for a formula to calculate the benefit of health. Their approach, which is apotheosized in the World Development Report, boils down to a criterion of cost effectiveness when setting health standards. Libertarians believe instead in the supreme value of the free market. Communitarians would let every community decide on its own standards of health.
2. It has distributional consequences.
3. It involves competition among groups to influence reform.
4. It is sensitive to the timing of various events, including elections, disasters, economic shocks (for example, it may be harder to make reforms at the end of a regime than the beginning).
5. It can affect the stability of regimes. In extreme circumstances reforms or the lack of them may push governments out of power or sweep them in.

Data--information--has weight in this process. People who design and conduct studies sometimes neglect to consider their political ramifications.

Political mapping aims to explicitly state in a logical framework ideas that many people carry loosely in mind. It is a tool for making health sector reform feasible.

The method:

A prerequisite is a counterpart within the organizational system whence the reforms are to be generated. Feedback from decision makers is also needed.

Political mapping also has risks. It can expose hidden agendas; reduce the maneuvering space ambiguity provides for some principals; anger some participants; create conflict.

Currently, MR has political mapping projects ongoing in Cambridge, MA; with the Federal Government; and in Cameroon and Ghana.

MR outlined the six procedural elements of the method:

1. Effects: What do the change makers want to accomplish?
2. Who's for it, who's against it?: Groups sometimes are more willing to talk about others than about themselves. Public and private positions on issues sometimes diverge. Principals may be friends, potential friends, or enemies.
3. Stakeholder Analysis: In the case of the Ghana project, the Rockefeller foundation was a minor stakeholder, since the amount they invested was only a minor portion of their budget. For the Ghanaian Ministry of Health, it was a large project.
4. Map: A schema depicts how each principal in the proposed change relates to every other one. The proposed change in Ghana raised the classic dilemma of whether a research advisory board is better positioned within or without the organization that uses research.
5. Transitions assessment: What changes and adjustments will the organizations undergo?
6. Strategies for change: What can you do to empower friends, win over potential friends, and persuade enemies to reevaluate and maybe adjust their goals and attitudes?

MR: Any questions?

--Giorgio: Isn't it often better to think in terms of individuals within organizations, rather than the organizations? This is often how things get done.

MR: Individuals are important. It's hard to systematize at the individual level, though. This is on the agenda for further development of the technique.

Paul expressed discomfort with the value-free nature of political mapping.

Afternoon

Julia Walsh: Health Delivery Systems and Health Outcomes

Statistics from around the world document a marked decline in the under-5 mortality rate. Life expectancy and the median age at death have risen almost everywhere, including the places where one

would least expect it, such as the sub-Saharan.

What accounts for these improvements? The determinants of health are many and interrelated in complex ways, but they can be sorted into three sets of factors: household and community, biologic, and proximate. Public programs can affect health primarily via the first two. For health planning, it is important to consider how much investing in education and other community assets can improve health indicators, and compare that effect to what can be achieved through immunization, clinical services, and other biological interventions.

A series of graphs from the 1993 World Development Report and other published studies provides some insight into these issues. A chart tracking per capita income versus life expectancy for a range of poorer and richer nations shows that smaller increments in income were associated with greater gains in life expectancy in 1993 compared to 1900. This progress reflects improvements in material infrastructures and knowledge about how to maintain health. With respect to knowledge, a graph comparing mothers' and fathers' educational levels with child mortality rates shows that the mother's education is a much stronger predictor of children's health.

Turning to medical inputs that affect biologic determinants of health, a study in Kerala (India), Costa Rica, and Sri Lanka revealed no strong correlation between per capita health expenditures and life expectancies. According to Caldwell et al, effective monetary investment needs a climate of high political will together with an advanced socioeconomic status for women. The targets of investments must be calibrated to actual need. For example, countries may reasonably divide their health budgets in various proportions between hospitals and community health centers, but it is impossible to imagine that investing the entire health budget in hospitals--as Sierra Leone did in the early 1980s--could make sense anywhere. [--Clifford: We've come away from that now.] A final graph related nutritional status to child mortality in specific age ranges, demonstrating the central importance of nutrition as a proximate determinate of health.

Efficacy studies are another way to evaluate the impact of initiatives to improve health. They have shown that measles vaccine can reduce child mortality by 30% (Bangladesh); malaria treatment by 50% (Kenya); oral rehydration therapy by 20-25% (in many places); antibiotic therapy for acute respiratory infection by 20%; pneumococcal vaccine by 20%; and vitamin A supplementation by 20%. Providing care for mothers during delivery can reduce maternal mortality 60%, infant mortality 20-30%. These figures represent results obtained by intensive, single minded efforts, and may not be reproducible in more usual field conditions. The efficacy of any intervention delivered to a community is the product of the following elements: its biologic efficacy, the percentage of the target population who receive it, the accuracy with which the target population is identified, the degree of provider compliance, and patient compliance.

All these factors are highly variable in field conditions. The proportion of the population using health services varies from place to place, as does that of the people with a facility within 'accessible' distance of 5 miles. Other program shortcomings need to be addressed via improvements in training of health workers. Some countries succeed much better than others at getting mothers to bring children in for all three DPT immunizations. A survey showed great variability between health workers in their ability to recognize, intervene in, and educate clients about acute respiratory infections. Another survey found that the number of households that possessed sugar and salt for oral rehydration solution was low in some African countries.

In summary, policy actions can be taken in a number of domains to achieve better health. Available mechanisms include regulations; incentives/disincentives/subsidies; public health programs; and clinical services.

Any questions or comments?

--Hussein: The statistics overestimate the impact of medical interventions. They're not credible.

--JW: These figures come from carefully controlled studies. The data from Matlab (Bangladesh) in particular was derived from a very large natural experiment.

--Hussein: How sustainable are donor-funded programs to give vaccines and antibiotics?

--JW: Sustainability is a legitimate concern. However, one cannot foresee the future in any case. And for as long as they are in place immunization programs incontestably save lives. Some children never get the disease who would. Others get the disease when they are older and less likely to die from it, since the vaccine spreads out inter-epidemic periods.

--Clifford: There is a need for qualitative studies of the factors underlying the quantitative picture received from DHS-style surveys. What are the attitudes that underlie utilization? The Bamako initiative recommends introducing user costs for public health services, but how can you do that when

nobody is using the services to begin with?

--Giorgio: Poor access and nonutilization of health services are problems that developing and developed countries share. The two tiers have much to learn from each other.

### **Thursday 8/5**

Michael Reich: Exercise in Applied Political Mapping

Workshop participants were given an exercise in political mapping to prepare at home for this class. Based on their readings of supplied data from Ghana, each one was asked to identify an important objective for health care reform and then work through the political mapping process.

MR asks: What are the main problems you found in Ghana?

--Azra: Eighty percent of schoolchildren are infected with schistosomiasis. A deworming program would lower these rates, indirectly improving general nutritional status and reducing children's susceptibility to diseases other than schistosomiasis. ....

--Muna: Children's learning ability would also improve.

--Clifford: Health education is needed to tell people how to prevent schistosomiasis.

--Paul: Baseline studies are needed so that the program's efficacy and cost effectiveness can be evaluated later.

--Joyce: Schools would be the best place to implement the program, because there's a captive audience.

--Peter: We need to consider sustainability before jumping into the program.

--Azra: The cost-effectiveness equation also involves comparison with other possible interventions on health, such as putting in latrines.

--Koffi: The benefits equation should also include on the positive side whatever impact it has in promoting general health awareness.

--MR: That's right, and the impact might be considerable, since schoolchildren also influence behavior at home.

--Giorgio: The program also sets a foundation for the Ghanaian educational system to be involved in subsequent health projects.

MR had the class tell him how they filled in the boxes on six political mapping grids. The first, "Policy consequences", listed in a vertical column all groups and organizations with an interest in the proposed program; the horizontal columns were for the supposed consequences of the program for all groups who would be implicated financially, geographically, or symbolically; the time when the group would experience these consequences; and whether the group would regard them as having high, medium, or low importance. For example, one donor organization would put hundreds of thousands of dollars into the program, with disbursements from July 1992 to July 1994, and would consider the program of prime importance. MR recorded the participants' answers on the blackboard, commenting on them and sometimes supplementing them.

The remaining grids followed the outlines set forth in the political mapping flow sheet: position map, stakeholder analysis, policy network analysis, transitions assessment, and strategies for change. The participants seemed well prepared and spoke up quickly at first, then became more laconic as the routine nature of the task became established. In the end, MR showed how he had filled in the chart for his actual effort in Ghana. The Ghana program is currently on hold, largely because there has been no single strong organization within the government to take responsibility for it. Discussions are going forward, however.

MR asked for questions and comments.

--Koffi: Can we have copies of your completed grids?

--MR: No. They are sensitive documents, since we are still trying to reach agreement with the various parties in Ghana.

--Justin: The possible strategies raised by the class include some that are "negative", such as polemics or boycotts against opponents of an initiative. Really, would you ever do this?

--MR: An example was a campaign to encourage drug purchasers in Europe and developing countries to boycott Bayer pharmaceuticals in response to their refusal to supply deworming medication at a price Ghana could afford. It didn't work. Conceivably, however, situations might arise where negative tactics could sway people.

--Giorgio: The mapping strategy needs to include more on how to assess the interests and approachability of individuals within organizations. Maybe the charts are too complicated, and could be boiled down.

--Paul: Given the frank assessment of individuals and organizations political mapping calls for,

wouldn't it be best to develop your charts with a few friends first, before proceeding to a larger group?

--MR: Agreed, it is potentially controversial.

--David Anderson: What resources and how long did the Ghanaian mapping require?

--MR: Approximately 3 weeks of information gathering by a library assistant and a collaborator within the Ghanaian government. MR then spent 10 days on the analysis.

Break

Allan Hill: The DHS Approach to the Measurement of Morbidity

The session referred to four publications that were distributed at the beginning: DHS Comparative Studies #1 and #4, DHS Conference Procedures; DHS Model "A" Questionnaire.

DHS had narrow goals. The surveys were intended not to describe populations as a whole, but rather to investigate the use of health services. Secondly, they were directed to provide socioeconomic information about the users of health services. Finally, they were to be used to standardize such definitions as "coverage rates" to facilitate intergroup comparisons. These objectives determined the design and implementation of DHS. They did not result in a tool that was well adapted for measuring and interpreting morbidity patterns.

DHS were primarily oriented toward children. Doctors had no input into the basic questionnaire, although in some countries physicians took control of the survey and added lots of questions about morbidity. This would seem a natural way to gather more information about morbidity. However, the gathered data contain clear indications that DHS questionnaires have already reached the limit of what people will tolerate. A spike in the proportion of children who are six years old suggests that some interviewers add years to younger children's ages to save work, since the survey instructions call for weighing and measuring all children under six. "No response" or "not known" are appearing on the forms with growing frequency, probably indicating that interviewers are not pursuing answers.

Many countries scheduled DHS for the seasons when travel throughout the countryside was easiest. The resulting season-specific portrait is adequate for assessing health care utilization, but can give a seriously skewed impression of the overall burden of disease. A combination of DHS data and medical data that is gathered routinely by doctors and clinics can give a comprehensive image of a population's health status. Medical records reflect seasonal differences in disease patterns and lack the socioeconomic input of the DHS.

AH referred the class to pages in the DHS interviewer's manual to point up specific problems with core questions. Some countries accepted a mother's word when she said her child had been



immunized. Others required a card certifying the event. In any one place, the two policies would yield different coverage rates. To facilitate international comparisons, the policy should be standardized one way or the other.

Again, mothers were asked whether children had fever in the previous 2 weeks. Yet what people call fever is not the same everywhere. Most countries asked about illnesses during the past two weeks, but some asked about illnesses during the past 2 months. People tend to be loose about when was 2 weeks ago, anyway. The lack of standard diagnostic indicators for cough or acute respiratory infections softens the accuracy of international comparisons of those rates, too.

--Giorgio: Suggested starting by asking about illnesses for which help was sought, then asking about illnesses for which help was not sought.

--AH: People tend to classify their illnesses according to severity. They go to ethnic healers and hospitals for mild and serious illnesses, respectively. They do nothing for slight and grave illnesses--thinking the latter to have "spirit" causes.

--Clifford: The Ghana survey asked about specific illnesses, but not general morbidity levels? How could you compare Ghana's disease burden with that of other countries?

AH: "Days in bed" is sometimes used as a functional definition of morbidity.

The participants found this measure less than satisfactory, largely because of differences in the readiness with which people of various groups take to bed.

--Riti: An open question about sickness would be useful in-country, but not very helpful for comparisons between countries.

AH drew attention to some questionable DHS results in the Comparative Studies #1 volume. All countries did not report the expected peak of diarrhea among children around the first birthday. Longer breast feeding in some countries may account for part of this discrepancy. In some surveys urban areas had higher rates of diarrhea than rural areas, despite the presumed advantage of more abundant toilet facilities.

--Clifford, Giorgio, Azra: Diarrhea is sufficiently multifactorial that one shouldn't anticipate strong rate associations with any single factor.

--Giorgio: The old rural-urban differentials are breaking down due to migration, the rise of shanty towns, and urban deterioration.

Reported rates of fever vary from 4% to 61%. Countries whose climatic similarities would lead one to expect similar rates of cough reported that from 4% to 40% of interview subjects had the

symptom. Something must have gone wrong with the surveys to produce such discrepancies. Perhaps it has to do with the ways different people interpret the questions, or with seasonal variations, or with respondents not having an idea that anything's at stake for them in the interviews. The DHS did reveal the important fact that respiratory ailments have a much stronger association with socioeconomic status than diarrhea does. Other studies have confirmed this.

Summary points: DHS data contains much information that can be of use. By and large, they suggest relationships that seem believable. It's safest to use them to study relationships between variables rather than absolute levels.

DHS data is gathered by statisticians and captures all sectors of the population. It can enhance the value of medical data fivefold by revealing how--and how much--people who use medical services differ from the general population.

DHS data alone cannot give a useful health profile of a country. It can fill in pieces that are missing from routinely collected health data.

Afternoon

Preliminary progress reports on group projects. AH stressed that he would like the final reports to resemble those consultants present to Data for Decision making. Laura Nyhagen will make appointments with the group leaders to demonstrate the formats.

Rosario Cardenas: Impact of maternal-child health services in the Arab world.

As an example of the use of DHS data for evaluating a program's impact, RC described some aspects of a survey she and Carla Obermeyer have been conducting in Tunisia, Morocco, and Egypt. Adopting the DHS variable of contraceptive use as a sign that a household has access to maternal health services, the researchers' analysis aims to identify socioeconomic characteristics--particularly those revolving around women's status--that influenced women's decisions to take advantage of these available services during their most recent pregnancy. Many of the socioeconomic variables being tested are drawn from the DHS, such as household size, the "crowding index" of persons per room, education, and endogamy (interpreted here as an indicator of low socioeconomic status). In this way, it will be possible to gain an impression of how utilization patterns have changed since the DHS.

The researchers' conceptual model posits that health services utilization is a mediating variable between a range of population characteristics and health outcomes. Hence, they are comparing results of their own survey with baseline statistics drawn from the most recent DHS to document changes in age-specific pregnancy rates, the incidence of low birth weight, and other outcomes occurring in the various socioeconomic groups.

Analysis will be by multivariate techniques. The goal is to find associations and not to quantify levels of difference.

--Giorgio: Contraceptive use is a highly biased indicator for access to health services. It's not an appropriate proxy.

--Hussein: Do people need to go to the health services to get contraceptives or can they buy them elsewhere--in which case they may not be a good proxy for access?

RC: Obviously, this isn't an ideal proxy. Looking at the DHS, we thought it was the best available.

AH: DHS don't tell much about the supply side of health services. In some surveys, countries attempted to enumerate the services available within 30 km of interviewees. They didn't ask about the quality or convenience of the surveys, which are important components of accessibility.

In response to a question by AH, roughly half the participants said they knew how to use multiple regression techniques for statistical analysis. AH briefly introduced the concepts of continuous, binary, and contextual (which can be converted to dummy) variables. Susan Yazdgerdi will elaborate and explain basic regression techniques tomorrow.

### **Friday 8/6**

Karen Peterson: Selection of nutritional status indicators for different public health purposes

KP asked the workshop participants to introduce themselves and describe their interests, particularly in regards to nutrition.

--Giorgio: Is a pediatrician heavily involved with maternal-child health and child survival programs in developing countries.

--Tabitha: Is a lecturer in demography. She wants to learn how to combine surveys, censuses, and other routine data.

--Hussein: Is trying to help the victims of the Somalian civil war.

--Joyce: Wants to learn how to obtain and use survey data.

--Kokou: Anticipates receiving plans for a nutrition program in Togo, which it will be his task

to analyze.

--Riti: Her country, Bangladesh, has much malnutrition. Riti has participated in field nutrition surveys in Bangladesh for 8 years.

--Azra: Desires to learn how to coordinate routine and survey data.

--Boris: Has data on famine mortality and period life tables in the USSR during the period of collectivization in the 1930s. [KP: Nutrition status in the former USSR is an interesting question. Walter Willett is beginning to work on this topic with WHO.]

--Luciano: Fifteen percent of children in his province (Ceara) in Brazil are acutely malnourished, and 40% chronically.

--Clifford: Works with a maternal-child health program whose objectives include assuring adequate nutrition. His unit recently brought in the results of a two-stage survey to assess seasonal variations in nutritional status. He also has routine survey materials to analyze. One problem is the relative weakness of the routine data compared with the well-conducted specialized surveys. How much weight should one give them?

--Komla: Malnutrition is one of the top health problems in Togo. The country has conducted a growth-monitoring survey using a complete set of 4 nutritional indicators.

--Koffi: Malnutrition is indeed a key issue in Togo. Their survey is part of the AID-sponsored WINS (Woman-Infant Nutrition Survey) program, and includes assessment of micronutrient deficiency.

--Muna: Works with UNICEF in Jordan and has a background in survey management. Jordan conducted a nutrition survey in 1991, but the data has not been analyzed.

--Sandra: The most important nutritional problem in Brazil is poverty. Many people can't afford food. Others have plenty of money and good nutritional status.

--Peter: Is a statistician with a particular mandate to evaluate nutrition monitoring projects.

--Paul: Is a lecturer in community health and a volunteer in the health department of the African National Congress. The immediate challenge facing South Africa is to grasp the general picture of the population's nutritional status. It is clear despite the lack of good information that there are discrepancies by region and socioeconomic sector. Tomorrow the ANC intends to start a campaign against the government's current nutrition program, which is not based on sound nutritional principles.

KP projected the WHO and US definitions of nutritional surveillance, stressing the key concepts. These include ongoing, regular observation of a population both for nutritional status and factors--sociological, biological, and other--that affect nutrition. The ultimate aim is to "make decisions to improve nutrition" (WHO).

Numerous indicators reflect nutritional status, but care must be taken to choose those that can be reliably measured in the field. The framework for analysis of malnutrition, its extent and causes, is uniform everywhere; but epidemiologic differences will make one or another element assume importance in different places.

Planners must consider what data are required to support nutrition programs and policies. KP projected an overhead of the information systems used to justify three types of actions: long-term nutrition monitoring, evaluation of program impact, and timely warning and intervention to prevent epidemics of severe malnutrition. KP elaborated and gave examples for each. For instance, most evaluation is done on the basis of local data for specific populations being served rather than national data. Timely warning systems involve some of the most complex and fascinating considerations. Usually the timing of intervention is based on only a few variables--sometimes only one--that determines who is at risk of dying without food assistance. In Indonesia low income and poor rice seasons can lead to deaths, in Bangladesh floods.

KP briefly reprised the history of international nutrition surveillance, from its origins in the 1974 World Food Conference in Rome to the United Nations First Report on the World Nutrition Situation in 1987. Workshop participants have received copies of the recent Second Report.

A conceptual model gives shape to the analysis of a population's nutritional status and problems. The researcher should be wary of fitting reality to the model rather than vice versa. The central task is to identify the ways variables interact to affect nutrition in the specific setting for the study. Sometimes subjective data is needed on whether or not people feel well nourished.

--Boris: Russia tends to have an economic policy rather than a nutrition policy.

Break

Karen Peterson: Anthropometric data: commonly used indices and their interpretation

KP reviewed the range of variables used as indicators of nutritional status. The body mass index ( $\text{weight/height}^2$ ) is the best for estimating risk for malnutrition-related morbidity and mortality. The indicators divide into five types, one of which can be assessed well using DHS data. Among those that don't show up directly in the DHS are:

1. Clinical criteria: Signs and symptoms are the only way to diagnose and document

protein/calorie malnutrition. Clinical information on large groups is complex and difficult to gather, particularly in developing countries lacking coordinated high-capacity information systems. Each diagnosis requires a number of observations. Diagnostic standards vary between medical centers and between physicians.

2. Biochemical: Laboratory tests of hemoglobin and ferritin levels can diagnose anemia. The latter is more accurate, but also more expensive. Expense and unavailability of adequate lab facilities render many desirable tests impractical in developing countries. The Centers for Disease Control and UNICEF are currently testing for micronutrient deficiencies in a number of countries.

3. Functional: These are the "so what" indicators that show how malnutrition weighs on people's lives. They include measures of fertility, fecundity, pregnancy outcome, work capacity. Short-term changes in growth velocity are good indicators of a child's susceptibility to infection. His or her cognitive capacity in the school environment might be the most sensitive indicator nutritional deficits, but internationally applicable standards are lacking for this variable.

4. Food availability and consumption: This data is usually presented in terms of the "mean dietary energy supply", defined as the total production and utilization of food in a country, including imports. Does good mean dietary energy supply mean everyone has good nutrition?

--Joyce: Not if the food is distributed unequally. In Jamaica, lots of food goes to hotels for people who are not members of the population.

--Azra: Cultural factors may affect supplies available to subgroups in the population. For example, in Pakistan women eat last. Biologic factors, such as a woman's need for more calories during pregnancy, also influence whether malnutrition develops.

Whatever indicator is examined, science and politics come together in the choice of a cutoff value for the definition of malnutrition. In developed countries it may be set at one standard deviation below the population mean for a given indicator. In countries where the government doesn't have money to bring everyone up to this standard, a person may not be considered malnourished until he or she falls 1.5 to standard deviations below the mean. Until recently, WHO considered that people whose energy intake provided less than 1.2 times the basal metabolic rate were malnourished. They recently raised this figure to 1.54 times the BMR.

--Hussein: Where did this 1.2 BMR come from?

KP: The Sukotme hypothesis held that people adapt their BMR downward when under food stress. In fact, people can barely drag themselves around when they're in this condition.

KP projected a chart of mean dietary energy supply showing rising trends from 1970-1989 in

all regions except South America and sub-Saharan Africa. KP asked what the chart suggested to workshop members about their areas.

--Clifford: In many African places food production is increasing, but population is growing faster.

--Luciano: Economic crisis and political instability caused the worsening in South America.

--Hussein: Do the statistics graphed here include food aid?

KP: Not sure.

--Peter: Food aid tends to come very late in a crisis.

A chart showed the proportion of regional populations who were underfed between 1970 and 1990 according to the new WHO definition of malnutrition. Again, sub-Saharan Africa and South America ran counter to the downward tendency prevailing in Asia, Middle and South America, and the Near East.

--Azra: Cash cropping for export can result in the apparent paradox of higher dietary energy supply and more nutrition among a population.

KP: Correct. Again, dietary energy supply doesn't guarantee access. On the other hand, the number underfed will always exceed those with frank malnutrition. When making policy, you need to keep both food availability and anthropometric measures in mind. The numerical relationship between the two varies in different settings.

The methodology for the use of nutritional indicators relies on basic statistical principles. The key considerations are the validity of the indicator and its interpretation. As an example, weight-for-height has proved sensitive to nutritional changes, but exactly which nutritional deficit it reflects is not known.

--Peter: How do genetic factors affect nutritional status?

KP: There are important genetic differences between people. Usually, however, socioeconomic variables explain more.

KP discussed the ways researchers select indicators for malnutrition. To describe the prevalence of the problem, they commonly choose a cutoff of two standard deviations below the mean of some anthropometric measure in a reference population (generally from an industrialized country). To assess changes in status over time, the ideal is to resurvey the same population; but sometimes researchers use an 'equivalent' group. For epidemiologic research on the consequences of malnutrition, wide geographic and social variations in nutritional status favor the collection of good regional rather than national data. The interface with the health system is a political and economic issue: How poor should a person's nutrition be before he or she is referred to a feeding program?

--Clifford: Negative two standard deviations would be too high in Sierra Leone. There isn't enough food to give to everyone in that situation. Developing countries need to set local standards for a number of nutrition-related triage criteria. For example, Sierra Leoneans generally have lower hemoglobin levels than Europeans. We have to take the risk and operate on people whose hemoglobin levels would be considered a contraindication in Europe, or a considerable portion of patients would die for lack of emergency surgery.

Another question bearing on the use of an indicator for treatment referral is, who is likely to benefit most? For example, protein-calorie supplementation during pregnancy adds more weight to the offspring of thin than non-thin women. So even among the neediest, some may be more appropriate targets for intervention than others.

In epidemiologic research, the best indicator is the one that best specifies the population you wish to target. Multiple indicators may be needed to predict the risk that nutritional deficits will lead to a poor functional outcome. In Bangladesh, Chen showed that children who fell into the tails of the normal curves for weight-for-height and weight-for-age had a much higher death rate--245/1000--than children who placed low in only one of these curves. These were the children who needed help fast. Using the Harvard standard, there is a clear threshold of malnutrition beyond which the risk of death rises sharply.



KP next reviewed the anthropometric measures available in the DHS. The most important is birth weight, followed by attained-size-for-age-and-sex; weight-for-height; arm circumference (reliable because it is easy to measure and changes little in the first 5-6 years of life); mid-arm circumference; body mass index; and skin folds (often problematic because of inter-rater variability).

--Hussein: In famines, the prevalence of malnutrition varies a lot depending on whether it's defined by weight-for-height or arm circumference. We are now following up to see which measure is more closely associated with mortality.

KP: The two measures reflect slightly different things, but they should give similar figures for malnutrition providing the cutoff values for defining malnutrition are coordinated between them. You are probably seeing an apparent variation in prevalence because of incoordination of these cutoffs. KP offered to discuss this issue further after the presentation, and supply references for studies of the reliability of arm circumference as an indicator of nutritional status.

A number of countries have developed their own reference standards for identifying malnourished citizens. A number of issues can arise. For example, it might seem reasonable to take the measure of the children of the best-off classes, and then try to bring everyone up to this standard. However, the elite classes may be genetically distinct from the others.

Break

Karen Peterson: Definitions of malnutrition using DHS data

The DHS anthropometric data can be used to define malnutrition according to 3 criteria:

1. Percentile: Subgroups can be compared to the whole population to see how their percentile rankings compare. In Roxbury, Massachusetts, for example, 10% of children have height-for-age below the level of the national 5th percentile for this measure. Hence, they have an "excess prevalence" of chronic malnutrition.

KP asked if a child in the bottom 5th percentile for this indicator was necessarily chronically malnourished.

--Giorgio: No, five percent fall into that group merely by virtue of the normal distribution. This could also be a child who had lots of infections that held back his growth.

--Azra: Disagrees. Malnutrition is malnutrition whether it's due to decreased intake or increased energy requirements.

KP: There is a complex interaction between intake, infection, biology, and other factors. If you could get the data, it could be analyzed using logistic regression.

2. Percentage of the median: What percentage of the 50th percentile weight-for-age is this child's weight-for age? The Gomez and Waterlow criterion for malnutrition--already calculated in DHS survey reports--is based on this statistic. It correlates well with the risk for mortality.

One potential problem with the G&W criterion is that the same percentage of the median has different significance at different ages. One who weighs 75% of the mean weight-for-age at 6 months is above the fifth percentile, but one who weighs 75% of the mean weight-for-age at 3 years is well below this cutoff. Hence, this criterion can underestimate malnutrition at higher ages and overestimate it in the very young.

3. Standard deviation score: This criterion automatically corrects for the age bias seen in the G&W criterion. It is easy to work with statistically.

KP next discussed low birth weight, referring readers to an article by Gale relating this occurrence to low weight-for-age. In developed countries, about 6%-7% of babies are born light, almost all on account of prematurity. In developing countries prematurity is estimated to be about as common, and up to another 18% of babies have low birth weight due to intrauterine growth retardation. Children who are born prematurely and those who have experienced growth retardation only during later pregnancy can catch up to normal birth weight children if they receive sufficient food early in life. Those who were malnourished only during later pregnancy can be differentiated from those who were malnourished throughout pregnancy by their body proportions.

Low birth weight is a good predictor of what will happen to the child in his or her first 5 years and beyond: school performance, learning disability, behavioral problems, increased morbidity. It signals an accelerated mortality regime, especially in countries with high infant mortality rates. Finally, it tells a lot about the mother, her environment, and socioeconomic status.

### **Monday 8/9**

Karen Peterson: Characteristics, sources, quality, and interpretation of nutritional status data

KP recapitulated the main points of Friday's lecture: A survey of basic indicators of nutritional status and the basic principles of their selection and use. The reliability with which data about the indicator can be collected is as important as the absolute validity of the indicator. A most important consideration is the selection of an appropriate cutoff value to define malnutrition. For example, ferritin level is a better absolute indicator of iron status than hemoglobin, but seldom used as an indicator because it is expensive and difficult to measure.

Whatever indicator is used, the nutritional status of the population under study usually is compared to that of a reference population. The indicator's sensitivity and specificity in the population together determine its suitability. Also the predictive positive value: How many extra people am I screening?

KP answered a question of Azra's from Friday: The Graham quotient referred to in a paper by Chen is used to eliminate the age bias seen with the percent of percentile criterion for malnutrition. It is not completely successful, and the standard deviation measure is generally a better way to handle the problem.

KP led participants in a discussion of the interpretation of the most commonly used indicators. If the child's length is more standard deviations to the left of the mean of the normal weight distribution than its height is to the left of the mean of the normal for the height distribution, the child is short and heavy relative to its length. Symmetry or asymmetry of stunting is an important sign. Why?

--Azra: Children with asymmetric stunting can catch up to normal children in growth, those with symmetric stunting can't.

In answer to a question of Hussein's from Friday, KP showed results from a study in which a population's prevalence of malnutrition was set at 13.5% using arm circumference as a measure, but was much lower using weight-for-height. Researchers have not yet established the best way to integrate arm circumference with other anthropometric measures. Possibly, the arm circumference has a built-in age bias. Another chart demonstrates the differing sensitivities and specificities of arm circumference, weight-for-height, and weight-for-age.

--Hussein: Our problem is to know the specificity of arm circumference with respect to possible mortality.

--Azra: Small arm circumference indicates chronic malnutrition and low weight-for-height indicates acute malnutrition. Any study will uncover more chronic than acute malnutrition. ....

KP made the point that there is seldom a quick and easy way to solve the mysteries of one's data. One must explore different ways of thinking about it.

KP turned to what a child's low birth weight tells about its mother. An article by Kramer identified four factors that explained about 75% of intrauterine growth retardation and low birth weight in a population having a 40% population attributable risk for these outcomes. They are primiparity, the mother's pre-pregnancy weight, low caloric intake or weight gain during pregnancy, and malaria. All except primiparity are treatable. In some settings, smoking contributes strongly to low birth weight outcomes.

--Joyce: In Jamaica, toxemia too.

KP: Suppose you wanted to address low birth weight in Jamaica. What easy and accurate data could you collect?

--Giorgio: Maternal depletion. The length of the interconceptual interval.

--Muna: The number of hours worked each day is a marker for depletion.

KP: How would you intervene to reduce the prevalence of short stature?

--Azra: Give antenatal attention to women at high risk.

KP drew attention to a handout itemizing the indicators used in the US to flag women at risk for giving birth to small babies. The handout is a good example of how to present data, but each country needs to select indicators for risk that are appropriate its own situation.

Qazi [a visitor today]: In developing countries it can be hard to collect data--such as in used in the US--on the maternal height, weight--and even on the baby's birth weight.

KP referred the class to an article by Rainer Sauerborn that ties the mother's and child's arm circumferences to the risk and occurrence of low birth weight, respectively. Traditional birth attendants can be trained to take these measurements, and WHO endorses this practice. The Sauerborn paper argues that standards for arm circumference, once thought to be universally applicable, need to be fixed and tested for use locally.

KP introduced the subject of socioeconomic status and resource variables that relate to nutritional status. A number of schemes exist for linking these variables to national, community, household, and individual outcomes. This type of data usually comes from administrative sources which have not collected it in a randomized manner, so a rigorous statistical analysis isn't warranted. Use it to investigate who's in trouble vis a vis nutritional status, who needs food supplementation or other help--and make your report in a descriptive rather than quantitative format.

What are the contrasting groups in your countries?

--Hussein: In Somalia, nomads, pastoralists, and agriculturalists.

--Boris: In Russia, ethnic and linguistic groups.

--Clifford: In Sierra Leone, urban versus rural.

KP: In India, religion--Buddhist, Hindu, and Moslem.

--Azra: In Bangladesh, high and low income.

--Koffi: In Togo, the north where there is a single rainy season, as opposed to the south where there are two.

KP summarized the characteristics of data from administrative and survey sources. In using administrative data, keep in mind that it tells you only about the portion of the population that is covered in routine collections. Designing the protocols for gathering the data, training and retraining workers, equipment costs, and quality control can all be headaches. A compensating advantage is that the results can usually be disaggregated on a local level for all the subgroups who are included. KP contrasted this with a recent multimillion dollar US survey that turned out to give truly representative results for very few segments of the population and to be completely unreliable concerning the homeless. Finally, to be sound, long-term planning usually requires a well-designed study to document causality of the factors that will be the targets of intervention.

Most countries conduct household surveys. The common difficulties in these efforts include poor translation between languages; overlong interviews; response bias that can occur despite representative sampling.

--Hussein: Some people don't report deaths for fear of having their food ration cut.

--Clifford: Use a subsample to check for validity if you suspect such goings-on.

Allan Hill: Longitudinal as opposed to cross-sectional surveys have been key in isolating the genetic component of nutrition and other outcomes in developed countries. For example, the Douglas cohort in the United Kingdom has been tracking a cohort of children identified by their being born on specific days. They're now following the children of the original cohort as well.

This continuity enables them to look at patterns in marital breakup, living arrangements, and more. The power of conclusions increases a lot, too, because using the family as a unit controls for all sorts of socioeconomic and other variables. The requirements for this study were a good postal address--not

always so easy in developing countries. It might be feasible, though, to keep in touch with women at antenatal care visits in those countries--which are not uncommon--where antenatal care attendance is very high.

KP: In conclusion, the choice of variables for measuring nutritional status must always be driven by what you want to accomplish with the information. In presenting data, it's always important to note its strengths and weaknesses.

Allan Hill announced that Nancy Pollock will be available to help participants who have brought individual projects with them to Boston make literature searches in the Countway library. The participants can then return home with up-to-date bibliographies. Perhaps Harvard will be able to forward books and articles to participants after they return home.

Break

Karen Peterson: Relationships among DHS nutritional and health indicators

KP showed several graphs from a study by herself and Marito Garcia, in which DHS data was used to examine relationships of low birth weight and other population health status indicators. The statistical technique to use in such analysis is the correlation coefficient. For example, combining data from 90 countries, low birth weight had 70% correlation with underweight among preschool children. Since the mother's food intake determines the child's birth weight, this finding illustrates the intergenerational patterning of malnutrition.

Relationships such as this may differ from country to country. What data should you collect to investigate them in your own country?

KP drew a matrix whose foci were low birth weight, childhood undernutrition, low weight and short stature in adolescence, short stature of adult women, and early pregnancy. She asked the workshop participants to name factors that predispose to each of the focal conditions and linkages between each pair of foci. She wrote their responses on lines joining the foci. As she did, she commented on current concepts of the strength of each of the linkages, specified what survey variables can be used to examine them, and noted which of these variables can be found in the DHS. ....

KP: What interventions, programs, or policies might break the cycle depicted in this matrix?

--Peter: More education and less time in the labor force for women, better economic status.

--Clifford: Strengthen EPI.

--Azra: Prenatal care, follow-up for children with low birth weight, growth monitoring.

--Peter: Train traditional birth attendants to use anthropometry and follow up children who fall behind.

--Boris: Increase the legal age for marriage.

--Paul: Survey children's and mothers' nutrition and health.

--Hussein: We can summarize all we've said so far as raising the standard of living. But you can't do that without social progress.

--Azra: Believes that some current interventions can help if they are utilized better, without waiting necessarily for fundamental social changes.

--Tabitha: The main point is women's education.

--Giorgio: An interesting exercise would be to check current interventions against this matrix to see if they are consistent.

KP: What interventions suggested by the matrix are currently implemented?

Workshop participants: Women's education, EPI, prenatal care, food and nutrition supplements, family planning, malaria chemoprophylaxis, community participation in health, promotion of breast feeding and supplementation during weaning.

KP summarized the discussion by characterizing nutrition information as the "great glue of looking at health data."

KP next turned to the Ghana DHS data, noting that it contained only a small portion of the data wish list generated by the matrix. The information, gathered on children 3 months to 36 months old, gives: age; a number of family economic variables; demands on the mother's time; a number of feeding variables; and anthropometric variables. What kind of descriptive analysis might you do with this information?

--Clifford: Demographic distribution of malnutrition.

--Peter: Socioeconomic status and nutritional status based on areas of cultivation, possessions.

--Giorgio: Prevalence of malnutrition based on deviation from international standards.

The remainder of the session enumerated additional DHS variables that might be applied to the problems the workshop groups are investigating, with some discussion of statistical techniques.

## Tuesday 8/10

Monica Das Gupta: Differentials in health and mortality by social class

MDG remarked on the diversity of backgrounds among the participants and asked them to let her know if she was repeating information they already knew.

She began by distinguishing between the epidemiologic and health transitions. The former is the evolution toward higher prevalence of degenerative as opposed to acute infectious diseases as life expectancy increases. The latter encompasses the former, with the addition of health behaviors, sociologic variables, and so on. It is concerned with the objective reality of cause of death, but also subjective perceptions that influence behaviors that make a difference to health.

Within a single population, subgroups--perhaps distinguished by wealth or geographic differentials--may be at different stages in the epidemiologic transition. Health services for such populations need to cater to a wide spectrum of needs--for example, preventing malaria by education among one subgroup, and treating with medical intervention among the other.

It is anticipated that different social classes will have differences in health. So will men and women. Social class attributes come in a package consisting of wealth, status, and knowledge. Each of these affects health outcomes in diverse ways. In addition to being a prerequisite for access to treatment, for example, possession of money limits exposure to disease through better housing and sanitation, and is associated with increased immunity through better nutrition.

Knowledge, which tends to be more widely distributed in higher social classes, affects exposure through domestic health maintenance (DHS contains data pertaining to this). People gain better outcomes through knowing when a disease is self-limiting and when it's appropriate to seek a doctor's help; this is a crucial factor in child survival in particular. The better informed can also choose a good rather than mediocre or poor doctor and understand the importance of follow-up care.

--Azra: In developing countries, knowledge of one's right to health care is spread unevenly and very important.

--MDG: This connects to status, how one is treated by health service personnel, whether your social position gives you the prestige to demand services effectively.

--Azra: Status in the family, community, and health system all count.

MDG explained why knowledge seems to have been more important factor in the health transitions of developed countries, while income seems more decisive in developing countries today.



Samuel Preston's study of the United States in 1915 found scant differentials between infant mortality among offspring of educated and uneducated, rich and poor women. No matter how much one knew or how much education one had, effective knowledge of disease prevention and treatment did not exist to be bought or learned. The first advances against mortality were in the form of improvements in sanitation and water quality which, since they were applied generally, did not immediately give rise to high differentials in health status between social classes. Those came more gradually, as knowledge of personal hygiene and disease prevention increased, then widened with the development of specific treatments, especially antibiotics.

Today in the developing world, by contrast, preventive and curative strategies are much cheaper than infrastructure improvements. They are more likely to be distributed unevenly among individuals and classes. Further, while they have had great success in bringing down mortality, this success is subject to reversals. The resurgences of malaria and tuberculosis are examples.

MDG discussed the impact of social status--how much social value a person has--on health status. In China, the preference for male children finds expression in the increasing number of boys reported born with each increasing level of parity. When a family has two girls, the likelihood that the next reported birth will be a boy exceeds by several times the normal 1.05/1 male/female ratio which has been reported almost everywhere else and seems to be biologically based. The reason is apparently that families that already have two girls are desperate for a boy, and so fail to report, kill, or neglect subsequent girls. In the United States, as another example of social status affecting health outcomes, the mortality of black infants is currently twice that of whites. In Europe, economic class determines such differentials, in India income and caste.

Households as well as wider cultures confer status according to age and gender. Hence, when researchers in Khanna, India, asked people how much care deceased family members received during their fatal illnesses, they found that the very young and the very old received less. Similarly, in the United States, blacks are referred for expensive cardiology treatments much less frequently than whites, even after the analysis controls for income and profession.

Variable predispositions to report illness can confound the efficient placement of services. This possibility is inherent in the fact that rising reported morbidity usually accompanies falling mortality. Reasons for this include an actual rise in the prevalence of disease due to the shift toward chronicity as well as an increase in old-age related ailments. In addition, people's subjective perceptions of illness change. Kerala, India, had more reported illness than Bihar, India, despite having better mortality statistics. What are the implications for services?

--Giorgio: A for-profit medical organization would put more services in Kerala, even though the need is greater in Bihar.

--Paul: Failure to meet the increasing demand for health care associated with falling mortality

could lead to a political crisis.

MDG examined some finer textures in the relationship between the mortality transition and the volume of reported illness. In countries in the early phase of transition, such as Maharashtra (India) and Ghana, richer people report more sickness and the richest a lot more. Countries that are further into the transition, such as Kerala, see more reported illness among the poor, less among the well to do. This corresponds more to what one would expect based on the actual distribution of disease. The psychology behind these phenomena have been schematized by Christopher Murray. In his model, the perception of illness among the wealthy rises at the beginning of the transition, then levels off and falls again, finishing slightly higher than it started. Poor people's perception of illness starts nearly level with that of the rich, then rises roughly exponentially to finish higher than that of the rich.

--Giorgio: Another real factor is that poor people get poorer care and poorer outcomes than the rich, so have to keep coming back.

MDG: Estimating the impact of unresolved illness on rates of reported illness is an interesting technical problem.

Nancy Pollock: The public may ignore poor health facilities, since they don't get any good from them. That would lower the rates of reported illness.

--Clifford: Cultural factors play a big role in whether people report illness.

MDG: Actually, people in Khanna have shown themselves very willing to jettison cultural beliefs if they have a crisis and perceive that technology can help them. The success of smallpox vaccine did a great job of promoting Western technology to people worldwide.

Break

Allan Hill: Comparative studies of differentials in health status and health service utilization

AH prefaced his talk with the remark, "We have done a poor job of describing the impact of services on health."

The ideal tool for assessing impact is the controlled study, but ethical objections to giving supposedly useful interventions to some parts of a population and not others have been important obstacles in the way of conducting such studies. There have been a few exceptions. For example, in Gambia financial concerns have preempted the ethical ones. The country cannot afford to give hepatitis B vaccine to its entire population at once, so they are starting coverage in a few sectors first and extending it to others in a stepwise fashion. The impact of the vaccine will be measurable in the differences in liver cancer rates of sectors who received the vaccine sooner against those who received it later.

In Egypt, a sort of natural controlled experiment became possible because, despite a strong nationwide effort to get people to use oral rehydration therapy for infant diarrhea, some areas adopted the intervention while others didn't. There have also been natural controlled studies of oral polio vaccine and high-titer measles vaccines.

Studies such as these that establish the efficacy of an intervention at the time of its implementation leave unexamined the role of secular trends--perhaps connected to social changes or infrastructure development--that can make or break its long-term impact.

In the absence of good information, some are nevertheless willing to conclude that medical interventions are primarily responsible for recent mortality gains in developing countries. UNICEF, for example, claims that oral rehydration therapy and the extended program on immunization saved West Africa from a reversal in the trend to lower mortality during the period of droughts and political unrest in the 1980s. What do you think of this argument?

--Hussein: UNICEF's argument is based on extrapolation from occasional surveys rather than ongoing studies.

AH: Good point. Mothers were asked how many children they had borne alive and the proportions still alive. This information is then used to project mortality rates backward. The method gives a smooth line for the mortality trend, although we know that in reality mortality is always something of a sawtooth.

AH set out two opposing views of the basis of mortality decline. Perhaps improvements in income, living conditions, and sanitation were primarily responsible. Thomas McKeown was the first to challenge the assumption that medicine was the decisive factor in lowering death rates in developed countries. In The Modern Rise of Populations, he attributed the historical emergence of longer life expectancy in developed countries to greater access to clean air, waste disposal, etc. Another view locates the source of mortality decline more in individuals, because of their rising levels of education, personal knowledge, and standards of hygiene.

Which theory do you prefer? Perhaps a combination?

--Azra: Medicine certainly has made a dent. The other factors, too.

--Reuben: Gambia has an EPI program but has not seen any gains in infant mortality. This suggests medicine alone is not enough.

AH: How can we use DHS data to look at the causes of falling mortality?

--Clifford: Make a model of the causes of death, then the contributing factors. In Sierra Leone only 40% of the population has contact with the medical system, so medicine can't be responsible for more than a 40% improvement in infant mortality--not even that much.

--Hussein: Who decides what was the cause of death? Medical doctors and lay people may have very different concepts of what is happening and why.

AH glossed these comments with the general statement that it isn't easy to define causes of death in broad categories. Certainly, medical services that are lousy can't accomplish much.

AH addressed the use of DHS data to document health care coverage, a prerequisite for medicine to have an impact. He displayed DHS survey data documenting low levels of immunization coverage in Eastern and Southern Africa. In Ghana, which is doing poorly, the age and education of the mother are strong factors influencing whether or not children receive vaccine. DHS cluster samples agree well with information gathered by WHO vis a vis some coverage rates, but discrepancies with others. One reason may be that some surveys required documentation that a child was immunized, while others took the mother's word for it.

AH noted that even if coverage rates are known, the actual immune status of those immunized usually isn't. For lots of reasons--a broken cold chain, late administration of vaccine, and biological factors--immunization may not result in development of antibodies. "Coverage isn't really proof of efficacy. This is a dimension of quality of care that we're not monitoring well."

AH showed DHS figures for oral rehydration therapy of diarrhea by medical personnel in various countries. Even though home use of this intervention has been proved efficacious, some countries--including Mali and Senegal--use drugs much more often. Still others don't use either modern modality.

Graphs showed that countries varied widely in their use of tetanus toxoid as well as medical protocols for antenatal and delivery care. The trends for use of these interventions are disappointingly flat in the period 1982-1990.

AH: Let's see what we can do to improve things.

AH distributed pages from DHS describing how to measure the impact of health interventions. Can you see yourself using these data?

--Participants: Yes.

The DHS also asks respondents how far it is to the nearest clinic, how long it takes them to get there, what are the clinic hours of attention, and who's on duty. Can we ask better questions than these?

--Paul: You need more indicators of the quality of clinics.

AH: How do you get accurate information when people spruce up and assume their best behavior for inspections?

--Clifford: Some things can be spruced up on short notice, others can't. Those that can't are probably more important--for instance, the availability of equipment.

--Peter: If you ask interviewers to fill out questionnaires, then may not know some things. For example, they may think anyone in a white coat is a doctor.

AH: How do you distinguish who's doing a good job from who's doing a bad job?

--Azra: Appropriate use can be measured by referral patterns. Not too many simple cases to tertiary care, etc.

--Muna: Number of patients seen. Ages, genders of patients.

AH: The use of records to get at these things is difficult. People doctor records for all kinds of reasons. In one clinic, we noted that they had recorded exactly 37 cases of diarrhea every month. The director told us that if he had 45 cases, the central authorities would declare an epidemic and institute much tighter scrutiny. Thirty cases or fewer, their consignment of medications would be cut back. Thirty seven worked out just fine.

--Giorgio: You can ask the employees what they do for certain illnesses, and compare what they say with a checklist of appropriate interventions. Do they know what to teach people about ARI, for example?

AH closed this discussion with the remark that following up fatalities can be a very important

way to gauge quality of care. These are strategic cases because their outcomes are so undesirable. Deaths are rare in most populations, making systematic investigation possible.

AH introduced a couple of "interesting" concepts that originated in family planning/contraceptive services but deserve wider application.

1. Efficacy in the laboratory and in the field differ. For example, people using contraceptives have higher rates of pregnancy than lab tests predict. People who are vaccinated have higher rates of the diseases they're vaccinated against than lab tests predict.

2. There needs to be a framework for defining quality of care. The Women's Health Coalition has made a list of nine elements that belong in a good reproductive health service, including a choice between contraceptive methods, follow-up care, integration with other health interventions. We need to make similar lists for other types of health service. Candidate prerequisites might be use of a common language, convenience, waiting time, the transmission of information along with treatment. Such a list would make it much easier for DHS to measure impact. They could just ask people which items they find at their local clinic.

--Bob Gardner: Are we talking about a separate survey or adding to the DHS? It would take a lot of work.

AH: This is problematic. But we do have to think more seriously about why people use or don't use health facilities.

Afternoon

Laura Rose: The demand for health care

LR outlined the basics of demand analysis as applied to health care. She defined the purpose of demand analysis as the identification and measurement of the relative importance of factors that affect demand for goods or services. Studies of demand for health look at the demand differences across groups and how changing health services and their delivery will alter the demand structure. Demand analysis is a useful tool for developing countries that want to learn how introducing user fees or private insurance will affect how much care is consumed and by whom.

The fundamental function sets the demand for a product or service equal to the sum of the price of health care, the price of competing goods, income, and tastes. The demand for a product or service is highly price-elastic if changing the price changes the demand a great deal. The demand for prenatal care is much more price-elastic than that for inpatient hospital care. So if one needed to raise money to sustain one's health care system, instituting fees for hospitalization would be more effective than charging for prenatal care.

--Paul: Disease prevention is generally preferable to treatment, but preventive care is much more elastic than hospitalization.

--Clifford: The quality of services has to be held steady for this equation to work out.

LR: Economics of course is only one of the considerations for health policy. Ethics matters too.

LR next demonstrated how to model demand for services. The model has three parts:

1. The utility function: The utility to be got from health care is better health status and the sustained or improved ability to consume other goods and services.

2. The production function: This has to do with the ability to use health care to become healthy, which may depend on variables such as one's age, sex, nutritional status, and education.

3. Budget constraints. Formally, one must have an income that is greater than the quantity of goods consumed times the unit price of the goods.

A consumer's objective is to try to maximize his utility function of a service or product subject to his production function and budget constraints. That's assuming the consumer is rational, has only his own resources to spend, and is well-informed. All three assumptions are debatable in health care. For example, doctors have strong incentives (not only financial) to misinform patients so that they think they need more care than they really do.

LR wrote the demand model in the form of a logistic regression equation whose dependent variable was the number of physician visits per year, and whose beta coefficients stood for the components of the production function and price. She assigned the workshop participants to list the variables (sociodemographic and economic) they would put into such an equation for Ghana, being as precise as possible about each. They were also to specify the sign they would expect the coefficient for each variable to take in the equation--i.e., would the variable increase or decrease demand? Finally, they were to say whether the information to analyze the variable is found in the DHS, and if not, where it might be found.

The class broke for one half-hour to do the assignment.

When the workshop participants returned, LR drew two grids, one for economic and the other for sociodemographic variables. While writing in their variables, she stipulated some criteria for collecting price information and cautions for interpreting it. The unit must be defined well and is best tallied on a per-visit, rather than per-illness basis. The ideal quantity to measure would be the price people expected to pay before going to a doctor, but this is not feasible. It is important to include travel costs not only of the sick person who goes to the health facility, but also of family members or anyone else who accompanies the patient. Always try to disaggregate expenses as much as possible.

The family income, perhaps estimated on a per-capita basis and controlled for family size, is most pertinent for estimating budget constraints. In one study in Cyprus, waiting time was a major explanatory variable for why people preferred private care to public.

LR then proceeded through the sociodemographic variables presented by the workshop participants. The DHS contains data on family size, household structure, and education, but little on the quality issues that more significantly affect the demand for health care services.

LR explained the fundamental concepts of demand analysis by logistic regression. The model can be made continuous by using a dependent variable such as the number of visits to a hospital. Or, it can be made discrete by using a categorical dependent variable such as public/private/traditional/no health care. The acceptable analytic methods are Tobit, Logit, Probit--but most emphatically not ordinary least squares regression.

LR outlined the history of empirical demand studies of health care. Early studies by Heller and Akin in Malaysia and the Philippines, respectively, concluded that changing price didn't affect demand for primary care. The World Bank cites these studies, though they have since been shown to have a major methodological flaw in that both failed to control for quality of services. A later study by Gertler in Cote d'Ivoire and Peru found that user fees did deter utilization, particularly by poor people.

There are other alternatives for obtaining a picture of what will happen if you start charging fees for services. The most direct is to introduce fees on a limited basis and see what happens. The Rand Corporation performed an experiment of this type in the United States in the 1970s and reported that people were price-sensitive. The Pricor Study in Zaire in 1983 tested the hypothesis that people would be more willing to pay by the illness episode rather than medical visit, and reached no firm conclusion. The Bamako study in the Cameroon found that people used health services more when drugs were added despite higher fees, suggesting that quality rather than cost can be decisive.

Focus groups are another way to pretest proposed changes, although in general responses to questions posed as counterfactual conditionals are not highly predictive of responses to actual changes.

--Hussein: Was the Bamako study disaggregated for income?

LR: Yes.

Azra: In our part of the world, quality is always promised but never delivered.

### **Wednesday 8/11**

John Wyon: Community health profiles: the lessons from longitudinal studies



JW began by emphasizing the need to set priorities. Workshop participants will need to hew to their organizational priorities, but should also have their personal priorities.

A first question for priority setting is: What are the most frequent serious preventable diseases among the people for whom you take responsibility?

--Clifford: From attendance records, malaria, ARI, diarrhea, malnutrition, hypertension in the elderly.

JW: What are the denominators for judging frequency?

--Clifford: A five-year old census and projected intercensal growth rates.

JW: What information are you missing?

--Clifford: We know the intercensal rates are off, because political disturbances in the neighboring country have sent a lot of refugees to us.

JW outlined the further elements of the knowledge base for priority setting. What are the epidemiologic determinants of the most important diseases? Which families and individuals are at highest risk? If the information isn't readily to hand, how can you find it out? Do you have sufficient knowledge of trends in birth and death rates to measure your program's consequences? Finally, how do you estimate changes in epidemiologic priorities based on program success?

JW summarized his introductory comments as follows: "Our game is to know the goal toward which we're striving. Others may have different stars. If they're in the health ministry, one may have to lope along with them. We need breadth of mind to go along with the old goals while holding our own goals in mind."

JW briefly reprised the history of the Khanna study. It demonstrated that diarrhea and pneumonia were the main causes of death in an area of Punjab, India. The same has proved true in many places.

The Khanna researchers defined tests and control groups at the community level. They conducted monthly censuses to keep track of births, deaths, and migration within their area. This procedure yielded very complete data concerning the age at which vital events occurred, and this data in turn was the source of insights.

A population curve for the Punjab in the years 1870-1981 enabled the researchers to relate their work to larger trends. Cholera, smallpox, plague, and famine kept the numbers level until the 1920s. Since then, a stable birthrate and declining mortality have produced steady population growth. The only interruptions in this upward trend were owing to an influenza epidemic in 1918 and partition

in 1947. Although improving, mortality was still high in the 1950s. At that time, over half of all women past childbearing age had lost at least two children.

The Khanna results showed that the infant death rate is a poor measure of child mortality. High risk continues into the second and even the third year. Comparing Khanna and the United States in (1957-1959), the infant death rate in Khanna was 10 times larger, while the second year death rate was 30 times larger. An unexpected result was that Punjabis who survived their second year of life had the same longevity as Americans of the same age.

--Azra: This is all very nice, but in Pakistan we don't have registration systems that can produce this kind of data.

JW: We are starting to understand that one facet of public health is to understand what's going on at the community level. What we found in the Punjab turned out to be similar to what was happening in communities all over India. Unless we take this picture into account we are cutting off an arm. We must convince policy makers that they need this information. Cost is another bugbear, but gathering this data needn't be all that expensive.

JW recounted more findings from Khanna:

1. Female children died at twice the rate of males throughout the neonatal period and the second year. The differential was highest among children of educated women. The villagers spent 2.5 times as much on health care for male versus female children.

2. The major epidemic diseases which at the time were considered the primary concern for public health accounted for only 6% of all deaths. The reason was that cause-of-death data all came from hospital records, whereas the vast preponderance of deaths were among infants and children who weren't brought to hospitals.

3. Women who supplemented breast milk with solid food rather than abruptly switching from nursing to solid food reported losing many fewer children. The weaning crisis occurs because children begin to receive fewer calories from breast just at the time when they need increased calories to support a growth spurt, and for energy to combat infections when they are exposed to pathogens that may contaminate other foods.

JW mentioned the Andean Rural Health Care Project as an illustration of the great variation in local situations which necessitates collecting information on a community level. In Carabuco, Bolivia, the burden of child deaths is not spread over the first two years of life, as in Khanna, but is almost entirely in the first month.

JW described the Jamkhad (India) project as proof of the power of community involvement. The originators loaned groups of women money to start small businesses, with the stipulation that the women had to contribute monthly to a common pool. The money from the pool was eventually used to support public health programs in the communities. The program now encompasses 200,000 people.

Break

John Wyon: Insights and key indicators for the management of community health programs

This session was built around an exercise JW preassigned to workshop participants, in which each was to think of a program goal and itemize elements that would have to be considered in bringing the program to reality. Four participants volunteered to serve as exemplars:

1. Boris: A study of the long-term changes in health status resulting from the Chernobyl disaster.
2. Riti: An epidemiologic study of the nutritional status of children in Bangladesh.
3. Paul: A DHS survey and a survey of the distribution of health care resources in a region of South Africa.
4. Sandra: A program to improve primary health care for poor people in northern Brazil, involving upgrading staff quality, materials and equipment, information, education, and communication.

The parameters of necessary information comprised a clear description of the program goals; a listing of the organizations who would become involved in carrying out the program; the institutional goals the program would serve; sources of funding; the originator's personal goals for the program; the preliminary and baseline data search objectives; and follow-up data gathering activities.

In closing, JW stated that the purpose of the exercise "was to lead us through four very different approaches to what we as public health people intend to do, and to demonstrate the importance of thinking through the whole process."

Richard Cash: Water and sanitation projects: outcome and process measures compared

RC began with the observation that water and sanitation programs are two of the largest budget items that are often justified by citing improvements in public health. It is commonly held that provision of good water should reduce diarrhea, but sometimes it doesn't help. Why not? The key to evaluating the water supply program--or any other program--is to pick the right thing to look at.

First, it is crucial to know how the disease acts in the society. RC showed a series of slides illustrating diverse ways people in developing countries use and relate to water. One view, was of cows wading in a river upstream from bathers. Others contrasted women carrying water from wells in an area of ample rainfall versus men straining ditch water in a dry area and others collecting rainwater in huge canisters during a monsoon.

Against this background, RC invoked Bradley and Feachem's four categorical relationships of

water and disease:

1. Water-borne: the infecting element is ingested with the water, and improving water quality is the way to prevent transmission.

2. Water-washed (trachoma) : the infecting element may be transmitted in various ways, but is removed when people bathe. Quantity rather than quality is a key consideration in preventing transmission.

3. Water-based (schistosomiasis): The infecting element is absorbed when people work or play in water.

4. Water-related: the water serves as the breeding ground for insects that carry disease to humans.

The way in which water is associated with a disease determines the proper approach to preventing the disease. For example, even with good drinking water, if there is not enough to support good hygiene, Shigella transmission can take place. Supposing we put in tube wells to improve the quality of water (actually, most studies suggest that quantity is more important than quality in most contexts) but find no improvement in the incidence of diarrhea. Do we conclude that the tube wells aren't doing their job?

--Joyce: Maybe hygiene is poor. --Muna: Are they using the well water or not? --Peter: How are they drawing the water from the wells? --Clifford: If you don't involve people in the building of the well, they won't use it. --Riti: People may continue to drink their pond water because they're used to its taste.

RC: Well water in Bangladesh has a high iron content. It looks and smells bad, discolors rice and clothes, and makes hair hard to manage. People don't want to use it.

After the group suggested several more ways people's practices might compromise the protective effect of the wells, RC summarized: "The point is to look at the process of the disease before even starting to evaluate the program. Diarrhea, for example, can be transmitted through water, feces on the hands, contaminated food--at least 50 different ways. Once you decide the factors you need to look at, the actual information gathering is often simple."

Considerations for preventing each of the categories of water-associated diseases are as follows:

1. When improving water quality to prevent water-borne diseases, measures have to be taken, too, to prevent the casual use of unimproved water.

2. When improving water quantity for hygiene, keep in mind that people won't travel too far to

get it. Try to build on people's cultural hygienic practices.

3. To interrupt transmission of water-based diseases, find ways to substitute for the activities in which people are exposed to water.

4. To decrease water-related disease, remove the need for water storage or provide more secure storage methods.

RC moved on to issues surrounding sanitation, beginning with a series of slides of waste disposal methods used in developing countries. Latrines drain directly into swimming areas; others are poorly designed and without ventilation so people avoid them; etc. Three factors of organisms determine whether people will be infected when they are excreted in feces:

1. Latency: Cholera is an example of an organism that is infectious immediately after excretion. Most parasites only become infectious after time.

2. Persistence: How long can the organism survive exposure to sunlight, for example.?

3. Multiplication: Does the organism multiply outside the body? This parameter also includes the ways people come into contact with the organism and the size of the dose needed to establish infection.

To determine what sanitary methods are best for preventing a disease, it is classified according to these factors. Water wash diseases, for example, are non-latent and infectious in low doses. Hence, without attention to personal hygiene, waste disposal alone can't significantly impede their transmission. RC led the class through the full classification scheme, specifying which diseases respond well to improved waste disposal and which require other approaches.

As when considering water improvement, we need to understand how a disease is spread in order to evaluate the effect of attacking it through sanitation. More and more we see that we need social science inputs, that is, to consider not only the natural history of the disease but also how it meshes with the society.

--Clifford: In this context, could telling people to boil water be an effective public health measure?

RC: It improves the quality of water. But why might people not do it?

--Workshop participants: Time, fuel, taste, possible accidents resulting in burns.

--Clifford: What about putting iodine in the water?

RC: It's difficult for people to keep up on a permanent daily basis.

--Joyce: Some public health people in Jamaica advocate putting a drop of bleach in water.

RC: Most such programs have not taken off in rural areas, for reasons of taste and cost.

RC raised the subject of high-risk groups. Children's feces are most dangerous, even though people tend to treat them as the least offensive. Fishermen spread cholera all around West Africa. Truck drivers spread AIDS throughout Africa and Asia.

--Paul: This raises the bigger issue of urbanization. Governments should not promote movement into cities unless they can provide sanitation.

RC: Often people bring attitudes from rural areas that are no longer appropriate in the more densely populated city. It may be okay to defecate along a country road, but it's hazardous to do so in a city street.

--Paul: What about the question of appropriate technology? Water-borne systems are horrendously expensive.

RC: The important principle is to adopt a system that matches the needs, desires, and quirks of a culture. You need to look at people's habits before installing a system. Some people are used to squatting when they defecate and will not sit down on a seat someone else has just vacated. There have been accidents, too, where children fell into latrines and died because the interior was dark and the hole was too big.

--Peter: How safe is recycled water?

RC: This is another good example of the need to match technology to the situation. The Vietnamese developed a double-vault autodigestion system. Technically, it worked flawlessly. They had to abandon the technology, however, because people took the water out and used it without waiting long enough for the autodigestion process to purify it.

## **Thursday 8/12**

Allan Hill: Determining cause-specific mortality of children

AH observed the people increasingly want to know about cause-specific mortality as a way of evaluating interventions by closely relating them to outcome variables. As autopsies of children are rare, especially in developing countries, this research proceeds by adding questions to a variety of surveys in order to ask parents of deceased children about the circumstances of the deaths. Some potential causes can be ruled out on the basis of the child's age: for example, no one dies of tetanus at age 5, and measles fatalities also occur only in a certain age window. Other potential causes can be ruled out if the child was immunized against them. In the end, one is left with a list of 12-14 possible causes of death that can be narrowed to one or two via a structured interview.

In practice, one can append such investigations to routine information gathering. For example, the workers who are assisting a woman in a birth can ask her about her previous child. If the child died,

the woman's concern not to have another death motivates her to try to identify the reason why. In many developing countries the mean birth interval is about 30 months, which does not present major problems for recall.

A problem with the method is the attribution of deaths involving fever. Many people automatically attribute fevers to malaria. Another difficulty is sorting immediate from underlying causes. One need not aim for high diagnostic precision, however. The objective is to measure proportional changes in the causes of death rather than individual experiences. One wants to show that immunization has decreased the relative proportion of fatalities that are due to whooping cough, or that oral rehydration therapy has lowered the proportion of deaths that are due to diarrhea. Death happens rarely enough that one can pursue these inquiries in every case without overloading the field workers.

Antenatal visits might be another excellent time to gather this information. One worker has suggested collecting it when mothers bring children for immunization, although this survivors' cohort may give a false impression. There's no reason not to try collecting the information in all three settings, as long as you are careful to weed out redundant cases.

Scott Campbell Brown: Concepts of good health: impairment, disability, and handicap

SB noted that as long ago as 1948 WHO described health as not only the absence of disease, but "total physical, social, and psychological well-being." Historically, public health has emphasized preventing mortality, in part by curing illness before it leads to death. Today, the focus needs to be expanded beyond morbidity and mortality to the quality of life. If workshop participants take up this challenge, they can expect to be on the cutting edge of public health for years to come.

In 1980, WHO introduced the International Classification of Impairments, Disabilities, and Handicaps (ICIDH) to facilitate discussion of disease in an international context that would not be hampered by culture-bound concepts. The ICIDH placed every permanent sequela of disease other than death or full recovery into one of three categories:

1. Impairment: Closest to the medical perspective, this category comprises deficits in bodily and mental systems function.

2. Disability: Takes the personal and to some extent the cultural perspective. Not, does the ear work?; rather, can the person hear?

3. Handicap: Refers to the individual's ability or inability to fulfill specific cultural roles. Compared to impairment and disability, handicap is much more culturally bound and less easily assessed by objective means.

Where public health resources are limited, a strong tension always develops between people who say prevention of disease is the most cost-efficient way to spend and organizations for rights for the disabled. We must seek some kind of balance.

Allan Hill: Does the World Development Report use the word 'disability' in the same sense as the ICIDH?

SB: People often use the word to encompass all three of the ICIDH categories. The terminology often is used loosely, sometimes perforce because pertinent studies one wants to draw upon have not conformed to the categories.

SB made the point that one can collect data and apply it to the prevention of impairments, assessment of how many people can be rehabilitated, and what can be done for the handicapped.

Any questions?

--Joyce: Is rubella vaccine routine to prevent hearing loss due to measles?

SB: Exactly. Rubella is the rare case of a vaccine given to prevent impairment rather than morbidity.

--Clifford: The category definitions are not clear cut. How would you apply them to the three stages we distinguish in hypertension--compensation, decompensation, overcompensation?

SB: The categories can become murky when you try to operationalize them. On the other hand, they do help clarify common ambiguities in related terms. With them in mind, you are clear whether you are using a term like 'age of onset', for example, to refer to the time of diagnosis (impairment) or the development of frank disability (disability). Likewise 'severity' may refer to social roles (handicap) or environment (disability), and the phenomenon may change or reverse over time.



It's important to realize that a person's condition can go from any category to any other. The arrows don't lead in just one direction. Imagine, for example, a person who loses his legs, loses his job, becomes depressed, and starts to drink. If he develops liver problems, he has gone from handicap on account of the loss of legs to new impairment.

The ICIDH is a useful tool to explore such issues.

Break

Scott Campbell Brown: International experience with disability measures

SB explained that disability measures become important in proportion as mortality gives way to chronic illness, more babies survive with disabilities and handicaps, and more people live to old age. SB cautioned against the assumption that old age itself causes disability: the emerging evidence suggests that accumulated insults are the major factor leading to disability in old age. Nevertheless, greater longevity is likely to be accompanied by more disability.

SB introduced a paper he produced with Mary Chamie, in which they tried to show how to operationalize ICIDH categories using available data. Clinical surveys are best for finding out about impairment and disability, self-reports for handicap. Objective and subjective sources will often diverge, often for reasons that are culture-specific. For example, American women routinely say they weigh less than the scales show.

SB led the participants through several tables giving rates of disability in selected countries. Although the purposes and methods of the studies that yielded the data were not uniform, it is possible to see patterns.

--Nancy Pollock: Why do boys everywhere have higher rates than girls?

--Giorgio: In Pakistan, girls have higher mortality rates and lower rates of reported disability. If girls had lower rates, it might be because of neglect causing death and underreporting.

SB: This is an entire discussion. Are there genetic, cultural, age structure, or other factors at work? The rates reported by different countries are so widely divergent that they can't possibly be looking at the same things.

SB pointed out some other characteristics of disability data. Rates tend to fall with advancing age, for example, since the disabled have higher mortality than the non-disabled. Because handicap is a culture-bound concept, this data is hardest to standardize. Taking up an article by himself and Chamie, SB advocated using positive function measures to set goals for rehabilitation plans. The technique is to change impairment codes to their inverse, function codes, indicating how much the person can do.

Data show that people with mental impairments nevertheless function decently or well in numerous areas, and these capacities can be built up.

Further tables show that some countries provide more special education for disabled children than others, and that countries may limit their data collection to impairments they intend to treat.

SB emphasized the importance of considering all possible causes of disability in order to aim treatment correctly. In the case of handicap, interventions may be directed at the environment rather than the disabled themselves.

An alternative way to assess handicap is to compare the disabled and the non-disabled in terms of employment status, income, and mortality.

The session ended with an ethical discussion. Giorgio questioned the rightness of devoting resources to expensive interventions to save babies who remained at high risk of growing up disabled, versus using those same resources for cheaper interventions to save currently healthy people from contracting disease.

--Azra: You can't justify letting weak infants die if the technology exists to save them.

SB: Disability need not be a burden. As an example, children who have emotional problems in school are at much higher risk for eventually committing a crime and going to jail. Special education may not solve these children's emotional problems, but it can train them to hold a job, pay taxes, and avoid prison.

--Azra: In another place where there is no money for healthy kids to go to school, how can you prioritize special education for the disabled?

### **Friday 8/13**

Rachel Snow: Women's health and women's health services

RS characterized the movement for reproductive health as being in a crisis. The historical division of family planning into social ministries and maternal/child health into health ministries has adversely affected coordination of the two efforts. The use of strictly demographic targets to evaluate family planning services has encouraged a casual attitude about the quality of services, and undermined women's rights.

Women in developing countries have been unhappy about the lack of health services. Women in developed countries have deplored the lack of concern for safe health interventions, as exemplified, for example, by the thalidomide experience. The two groups are merging their concerns in anticipation of the upcoming Cairo World Population Conference.

In family planning, the Women's Health Coalition is pressing for more attention to the needs of women with specific biologic and health conditions that may contraindicate use of some contraceptive methods; combining contraception with prevention of diseases of the reproductive tract; more user control over the method of contraception; and a wider variety of male contraceptives. RS noted that the implications of user control for the contraceptive mix varies across cultures. Women in the United States favor barrier methods, for example, while women in some developing countries prefer injectable contraception that can be taken secretly.

With regard to women's health services, inadequacy is evident in statistics showing the persistence of high maternal mortality in developing countries. Feminists complain, with good reason, that the present modus operandi overemphasizes family planning and underemphasizes women's health.

The argument for concentrating on women's health finds additional impetus in the current World Development Report. According to the disability-adjusted life years measure elaborated in that document, communicable and maternal entities account for more than half of the world's disease burden. The Report's guidelines an essential health package recommends addressing five clusters of problems: prenatal and delivery care, family planning, sick child management, tuberculosis, and sexually transmitted diseases. All except tuberculosis have much to do with women's reproductive health.

These arguments will be made in Cairo in 1994. Meanwhile, the Harvard Population Studies Group plans to publish a three-volume book discussing ways to reconcile feminists' and women's concerns with family planning and maternal-child health in the context of more comprehensively conceived reproductive health services. The idea is to look at the woman organically, over her whole life cycle.

--Hussein: Other schemes--Health For All By the Year 2000, and Maternal-Child Health--haven't worked. Like those grand enterprises, this one originates in the developed countries, and like them it will fail. A big difficulty is reliance on the Ministry of Health, which is always among the weakest.

--Clifford: I attended the WHO Human Reproductive Program at WHO before coming here. They're still devoting scant resources to male contraceptives. This allocation seems to be based on needs. People make the mistake of thinking of these as women's problems as opposed to men's.

--Stephen: Are women in developing countries very involved in this movement?

RS: Women from South Asia and South America have formed an organization called Developing Alternatives For Women In the Coming Decade. African women unfortunately have not participated, which reduces the generalizability of all these initiatives. Still, the fact remains that this effort originated in developing countries.

RS called attention to some of the hurdles the concept of reproductive health services will have

to clear before it can be implemented. What are its parameters? What happens to women from the earliest ages and even before birth can affect reproductive health. Should or could a program address social advancement and financial independence of women? This definitional vagueness is to some degree a political advantage, in that it confers a looseness of agenda.

--Peter: When family planning started it didn't work that well. People didn't come out for it. Things only improved when we combined the two services and concentrated on demand. Now you want us to separate the two again?

RS: I didn't mean to imply that I don't approve of integration of services.

--Azra: Pakistani women don't use family planning services much. Combining maternal-child health with family planning might reduce utilization of the former, too. These women can't get contraception without their husband's permission, and doctors will not give these services unless the husband agrees.

RS: I agree with your point, reproductive health services must be region-specific and locality-specific.

In an interesting chapter in a new book [[Power and Decision: Social Control of Reproduction](#)], Balakrishnan illustrates the dangers of ignoring local social norms. The feminist anti-amniocentesis movement in India has driven abortion underground, where the effects on women's health are bound to be dire. The persistence of heavy demand for abortion proves that the movement was bound to fail anyway in its goal of preventing selective abortion of female children. A better approach would be to live with the practice until it can be eliminated by general social measures, such as elimination of dowry, opening up professions to women--generally, raising the benefits of having girl children.

--Giorgio: Most health professionals don't sufficiently respect women. We need to make curricular changes to correct these attitudes.

--Joyce: Not only health professionals. All men.

Break

Ian Aitken: Interventions to improve reproductive health

IA: What are the specific realities affecting women in the area of reproductive health? How can we put things together to make more effective programs?

The World Development Report Supplement attributes 36% of the world's total disease burden to problems related to reproduction: maternal mortality, STDs, HIV, anemia, and other infections. It also proposes offering a set of interventions based on cost-effectiveness.

Maternal mortality can result from sepsis, hemorrhage, eclampsia, obstructed labor, or unsafe abortion. Almost all of these require referral to a hospital for treatment. Hence, the need arises to screen. Parity and age of mother are two commonly used screening criteria, but unless other criteria are added, they can lead to overreferral. In Bangladesh, for example, if you send all primiparas and all tetraparas to the hospital, that's over 50% of births. Furthermore, these characteristics predict only 0.7% of maternal deaths that actually occur. Clearly, we need to look more closely at these women. Meanwhile, is another strategy available for preventing these maternal deaths?

--Paul: Family planning, delaying pregnancy among teenagers and reducing pregnancy among older women.

IA displayed statistics--available from DHS--showing that complete prevention of high-parity pregnancies in Bangladesh would reduce maternal deaths by 25% and births by 22%. Additionally, it is known that bungled abortions cause most of maternal deaths, particularly among these grand multiparas. Conclusion: Prevention is a good strategy in Bangladesh, with multiparas the best targets. In another society, teenagers might be the best targets.

Postpartum hemorrhage, another prominent cause of maternal death, is best predicted by previous postpartum hemorrhage. IA presented a series of statistics supporting the argument that previous hemorrhage, like parity and age, is nevertheless a poor basis in itself for referral to a hospital.

IA drew attention to the statistical fact of the inverse relation of any test's sensitivity and specificity. The place where the two curves cross is where the predictive power of the test is maximized.

IA introduced the partograph, a tracing which tracks a woman's progress through the stages of delivery. It tells health workers when a woman is falling significantly behind schedule. There is an "alert" line and an "action" line, the latter signalling the need to send the woman to a secondary or tertiary center. If the workers respond promptly, most women will arrive at the hospital in good enough physical shape to benefit from emergency care. This approach has been proven in New Guinea, and IA recommends its use with all women giving birth.

IA displayed statistics demonstrating the extensive contribution of sexually transmitted diseases to reproductive health problems. In developing countries, for example, they cause 15% to 80% of infertility. This suggests that family planning must take women's reproductive health into account.

Afternoon

Allan Hill: Week's end review

AH asked workshop participants if they felt there had been any gaps or holes in what the workshop had covered so far.

--Paul: Statistical methods for data analysis.

--Clifford: A clear presentation of the objectives of the DHS. We are trying to bend this data to other purposes without really knowing what its intended purposes were. Also, more on the methodology of conducting these surveys.

--Joyce: Statistical analysis.

AH: What would be most helpful?

--Joyce: Examples.

Clifford: How to mix data from DHS and routine collection.

AH: This requires good case studies. We have some grad students working on that.

--Nancy Pollock: You can find examples in the three volumes from the DHS World Conference [previously distributed to participants].

--Koffi: How can we draw a sample for a DHS survey?

AH: Some things we would like to do better. Some of your countries are involved in what UNICEF terms "complex emergencies". Usually these are war situations, but the impact is that many things go awry at once. The dimensions of taking stock are altered. We will try to produce more case studies in which things are followed through from start to finish.

Following an update on the revised schedule for the last week of the workshop, AH used data from Mali to demonstrate a simple method of statistical analysis. The trick is to collapse all social class (or other continuous) variables into a small number of categories. This makes possible a simple row-and-column statistical analysis. The technique has the advantage of intuitive clarity, which can be a help in presenting arguments to a minister. Disadvantages are that, compared to logistic regression, it can be an inefficient way to use data. Sometimes there are only a few cases in some categories, which leads to wide confidence intervals.

### **Monday 8/16**

Philip Musgrove: The World Bank approach to health

PM asked workshop participants what they thought of the World Bank approach to health.

--Hussein: WB wants health care privatized.

PM: Half true.

--Peter: Concerned with improving health globally.

--PM: Nice to hear. Some people don't think so.

--Clifford: WB is pushing for user fees for health services.

PM: Half true.

--Paul: WB translates health into economic units.

PM: Half true.

Hussein: WB emphasizes population levels, is less interested in family health.

--Giorgio: I was positively impressed by the emphasis placed on training health professionals, particularly at the middle and upper levels.

--PM: Failing to train professionals would be a recipe for wasting your money.

--Azra: WB attempts to create demand for health care, especially by families. Sometimes it appears that the underlying motive is to make people more economically effective.

--PM: This actually contrasts with our view, which is that health is important because it is a fundamental right.

--Hussein: WB saw that the structural adjustments they forced on developing countries in order to collect debts when economies were falling in the 1980s caused great suffering. Its current interest in health results from a guilty conscience.

PM: That's a common view, but false.

PM outlined three reasons why the WB decided to devote its report to health this year:

1. Based on the continuing improvement in global and regional health indicators despite worsening economic indicators in the 1980s, it surmises that this is an area where human welfare could advance without waiting for everyone to become affluent.

2. Economics in health has characteristics distinct from those of all other sectors. An exploration of these might show the way past some sticking points in health advancement.

3. WB feels that although private enterprise is most efficient in most endeavors, government involvement is crucial to good health care.

PM outlined a thought experiment to illustrate why WB chose to look at health instead of income advancement this year. Participants were to imagine themselves typical citizens of their countries who are told that 10 years from now they might have either 10% more income or a guarantee that their children will not die. Most would choose the latter. "This is the choice we are offering."

PM complicated the question by asking, what if we raised income 10% and added 3 years to schooling? Then the choice is harder to make. He stressed that the WB did not factor education into its calculations.

PM fashioned a metaphor in response to Hussein's earlier criticism that the WB became interested in health because of a guilty conscience. Cars were speeding downhill toward cliffs. Someone told the drivers they needed to slam on the brakes to avoid plunging to destruction. Some passengers were shaken up and hurt by the sudden deceleration. A WB structural readjustment program of the 1980s was just such a necessary braking of an economy that was racing to ruin. It caused suffering, certainly, but much less than would have ensued had the economy gone over the cliff. Hence, the WB does not feel remorseful.

Studies have shown that structural adjustment actually caused less suffering than might have been expected. A plot of national incomes versus life expectancies suggests that only countries in frank poverty, and not those with average incomes, is associated with lower life expectancy today. During the 1980s, few countries actually backslid into frank poverty. Another way of looking at this is to observe that medical recourses are much more highly developed than they were when most national economies progressed to present levels. These recourses are not lost, and in fact medical progress continues, no matter what the economy does. Hence, if a country's average income level falls back to what it was, say, 30 years ago, that doesn't mean life expectancy will revert with it.

Countries that accepted WB adjustment programs went through a short period where they spent less on health than others. Over the whole period from the readjustment to the present, however, they have generally spent more per capita than countries that did not go through readjustment. Brazil, the only Latin American country that has not gone through structural readjustment, is the only one that seems on the verge of severe setbacks in health.

--Hussein: WB should have a contingency plan for people who suffered under adjustment.

PM: That's absolutely right.

--Hussein: What about the equal right of everyone to health?

PM: The composition of spending is where this is addressed. Suppose you are social security minister of Peru and the finance minister tells you to cut your budget 20% to be in line with the readjustment program. You reduce spending on drugs 75% and hire more people. Will his aid health?

--Azra: No, because without drugs you can't treat illness.

PM: Right. The WB didn't tell Peru to use its social security funds to create jobs, but that's what they did. The point is, WB can only advise societies generally on how to spend their money, but can't tell them how much to spend on health or how to spend it. Better choices for savings might be trading off a doctor's time for a nurse's, or buying a cheaper rather than a more expensive drug.



--Azra: If the government of the developing country is dumb enough to screw up the economy for 30 years running, how can they be expected to make good decisions during readjustment?

PM: Granted. But you have to start somewhere.

In summary, the WB turned its attention to health because it sensed health gains are possible despite economic stagnation or backsliding. The WB takes the position that health is important for its own sake, not as a prerequisite for economic productivity or anything else.

Break

Philip Musgrove: The optimal package of health services

PM remarked that the title of this session is a misnomer, since there is no single optimal package of health services for all countries.

PM explained the idea of "burden of disease" as the per capita life lost to illness. WB uses disability-adjusted life years to measure it. Starting with the incidence of disease in 1990 and projecting into the future, people worldwide lose an average of 25% of their biological potential of 80 years of healthy life to disease. Africans lose 60%. Mortality due to infectious diseases burdens health the most in sub-Saharan Africa. Noncommunicable diseases waste the most DALYs in developed countries. In Latin America, infectious and noninfectious diseases are about equally destructive. "This is the epidemiologic transition in a nutshell."

PM briefly discussed the formulation of DALYs. A panel of clinicians assigned weights to each and every disability diseases can cause. These weights are based on the clinicians' impressions of their patients, hence somewhat subjective; but they are also fairly stable, in that changing them by 10% doesn't alter the rank order of the most burdensome diseases. The DALY concept employs a second weighting system that incorporates the apparently universal conviction that good health has the greatest value to the individual and society during young adulthood, and much less in the first few months and last several years of life. PM stressed that these weights are meant to represent social rather than economic values. For example, young adulthood is when people often have their peak vitality and have living parents as well as young children who love and depend on them.

PM described the advantages of the DALY concept. It combines morbidity and mortality in a single measure, facilitates the reasonable treatment of ethical problems, and lays the groundwork for establishing health priorities.

PM wrote two logistic regression equations to explore the question of whether spending on health improves health. The equations related life expectancy in 1990 to per capita income and education; and health expenditure to per capita health expenditure. The analysis revealed that, given their level of income and education, some countries gained more than the predicted amount of added life expectancy for their investment, while others got less. The lesson is that it's how you spend the money that makes the difference.

PM displayed a graph from the World Development Report revealing that some disease interventions have much greater cost effectiveness than others, in terms of DALYs saved per dollar. The difference is as great as 2 or 3 orders of magnitude. The most cost effective intervention of all is treating adults for tuberculosis, which rebuts the assumption that preventing infant deaths is always better than treating adult diseases. The evidence does not support the view that prevention is always more cost-effective than cure.

The WB recommends that each national health ministry make a list of the most important diseases in its population. Next, make a list of solutions and rank them with the one that gains the most DALYs for the least investment at the top. Then simply go down the list allocating funds until there is no more money. The WB has used this procedure to create a set of basic health care packages countries might want to offer. Use of one of the packages could solve 80% of the burden of disease among children for less than \$100 per child. Nearly a third of the total disease burden in developing countries could be eliminated for about \$12 per person per year. Stopping tobacco and alcohol use and finding ways to stop the spread of AIDS are major priorities.

Problems: Some countries don't have enough money to spend \$12 per capita per year. In many places, political resistance obstructs program implementation.

Afternoon

Philip Musgrove: Who should deliver services and who should pay for them?

PM solicited questions about this morning's presentation. Giorgio observed that most epidemiologic studies yield disease incidence in terms of point estimates and confidence intervals, but the World Development Report simplifies these results into specific levels. Is there not room for error here? Secondly, what should countries do who cannot afford the even the minimum of interventions recommended by the World Bank?

PM responded that the WB used point estimates for simplicity. Switching to confidence ranges might change some rank orderings of disease importance in some places. That's one of the reasons every country should perform a detailed analysis of its local conditions and needs before setting its policy. Still, the fact that different interventions have cost effectiveness that may vary by 2 or 3 orders of magnitude minimizes any effect such a change might have on the choice of which interventions to implement. As to Giorgio's second point, an upcoming supplement to the WDR will address the question of how to tell if your facilities and staffing are adequate for delivering a given intervention. The principle to follow is, if you can't do it right, don't do it at all.

Much of the reason why there's small demand for health services is that different components aren't combined reasonably for the convenience of the client. To apply the WDR, you need to think about matching services up--e.g., putting STD clinics in the same locations as maternal-child health clinics. Here is the context for considering whether your system has adequate capacity for all the interventions you want to offer.

PM remarked that the WB minimum interventions package is so cost effective, synergistic, and simple to apply that it's hard to justify not offering it. Countries who aren't equipped to spend even the minimum amount necessary need help from donors. A number of countries spend much more, but don't get commensurate results. What's going on?

Supply and demand fails to regulate the health insurance market. The cost of getting sick is potentially infinite, motivating companies to try to sell policies to precisely those people who are least likely to get sick. In addition, people who become sick or think they do feel no incentive to economize on services. The solution to these two problems--which are called Adverse Selection and Moral Hazard--is to socialize insurance. Everyone can then join in the risk pool, and the government can set the rules for which interventions it will offer and how much it will pay. That's what rich countries (except for the United States) have done. Poor countries haven't yet worked through this logic. They--particularly the ones who talk a lot about socialism--rely much more on private insurers for health care protection.

This analysis implies that public good is a secondary motive for governments to involve themselves in health care. Primary is the need to protect the economy from uncontrolled spending in the sector.

PM asked, what does "the right to health care" mean? Giorgio described a recent experience. Albania doesn't have money to provide all its children with treatment for acute respiratory infections. Yet recently the country paid for a single child to go to Italy and have an expensive treatment for another disease. Giorgio disapproved of Albania's decision to devote to one child funds that could have saved many lives if used to distribute a simple intervention for a common disease. At the same time, he felt morally compromised, since he knew that in case of need his own child would certainly receive the same treatment as the chosen Albanian child.

PM responded that the problem is not inequality per se, because the underlying question of affordability never goes away. Even if everyone in the world had equal incomes, choices would still have to be made, and different individuals and countries would choose differently. The WB suggests that each country implement the most appropriate basic package, then ask the people what they want to do with any leftover money.

The WDR recommendations for public sector financing of health services are based on national income and DALY efficacy. The government's most urgent responsibility in poor countries is to give poor people the appropriate minimum package of services. The more well-to-do can buy these services or pay for them with insurance. Any further disbursements need careful justification and perhaps supplementation with user fees. Richer countries have the wherewithal to provide essential packages for everyone, and maybe some extras.

User fees are good for raising money in rich countries. In poorer countries, they'll bring in only a little, but it may be enough to subsidize the basic health package. Another argument for instituting them asserts that people will make smarter decisions if they have to pay.

--Azra: User fees can become occasions for discrimination in places like Pakistan, for example, where people spend money on men and boys but not women and girls.

PM: This is an important counter to the argument that charging money rationalizes demand. In fact, no study has validated the argument.

Break

Philip Musgrove: Research and evaluation needed

PM stipulated two rules to guide health care allocations. Ethically, you should never buy anything for the non-poor you don't also give to the poor. For reasons of efficiency, you should never buy something that is less cost effective than something you don't buy.

Many Latin American countries break the first rule. They pay for health care through their

social security systems despite the fact that the unemployed have greater need. By the same reasoning, letting employers deduct private insurance payments is unethical.

The basic principle is to try to cover everyone, but not necessarily for every health problem. There is good cause to emphasize essential services until you achieve universal coverage.

PM asked if anyone could give a good reason why the public rather than the private sector should pay for health care.

--Giorgio: Nobody should profit from health. Why shouldn't the government keep the profit instead of letting private people have it? The government can be more cost effective.

PM: The first assertion is absurd. The second makes sense if government can provide equal quality services at equal or lower cost--but otherwise a government monopoly is a burden on the people. The third is often not true.

Best, PM stated, is competition between the public and private sectors with the public having free choice between the two. This situation tends to maximize quality and minimize cost. The Canadian system is a good example. The government's tasks are to assure quality, insure against excess demand for services, and prevent fraud. In sum, the WDR is against competition in insurance, and for it in provision.

--Giorgio: How can there be competition in outreach areas, where poverty removes the incentive for private enterprise.

PM: Where the private sector declines to go, the public sector must provide care without competition. In fact, however, poor people have always been willing to pay shamans, curanderas, and what-have-you for care.

PM concluded with a summary of topics for further research. These include methods for communicating information to doctors and the public, medical treatments and vaccines, and why, for example, many people forego vaccinations, and others persist in wrong conceptions about AIDS.

What are the research problems in your countries?

--Azra: Cultural factors.

PM: I would guess a lot of the failure of health services has to do with inattention to cultural factors that underlie utilization or nonutilization.

Peter: In South Africa we find people ask for things we can't provide. We have three tiers of activities based on resources and degree of modernization. But mobilizing the community is difficult even at the basic level.

PM: Sometimes the problem is the community, not the government's ability to listen to the community.

--Azra: WB will give money to countries with a basic health care package?

PM: WB proposes to help any country willing to work out and implement its own list of minimal health care.

## **Tuesday 8/17**

Rannan-Eliya: Methods of measuring health expenditures

RE asked, how much do you spend on health in your countries? How much does the private sector spend on it?

--Koffi: We know the public portion of the total budget, nothing about the private sector.

RE cited a few definitions of health spending, and said that Griffith and Mills' was most serviceable: "All capital and current expenditure whose primary intention is to improve health." It is also reasonable to include, albeit separately, money spent on sanitation and water.

RE projected a pie chart showing various sectors' public health outlays in Thailand: the ministry of health, army, social security department, and public employee and state enterprise funds. The point was to remember that diverse governmental and quasi-governmental organizations may be spend on public health, and the tally should include them all.

How would you measure expenditure for public health?

--Koffi: Review departmental budgets.

RE: Is there ever a difference between how much is budgeted and the amount actually spent?

--Clifford: You're lucky if you get 60% of what is budgeted on paper. Administrative bottlenecks take some, and sometimes the budgeted amount includes money that just doesn't exist.

RE: In some countries, the actual spending may add up to only 20% of the budgeted sum. To get the true measure you need to go through official records.

RE said that most foreign aid donations go through the ministry of health, although some are administered directly by NGOs. The only way to itemize these contributions is by survey of the donors, which is often more easily done from outside your country than in it. When donors give in kind, it's hard to put a value on things.

In many countries, private expenditures for health are larger than public. RE showed a graph to

make the point that knowing the level of private spending is important for decision makers. Estimates of private disbursements in India ranged from 2.9% to 8.3% of the gross domestic product. If the latter figure is correct, then the Indian government may not be spending enough and, at the same time, may be misallocating funds.

The ministry of health usually has some information on how much people spend privately for health care. Private practitioners' tax records are a useful, if treacherous source.

--Koffi: Practitioners underreport income to avoid paying taxes.

RE: This is probably the case in most developing countries. Household surveys that ask about outlays provide more trustworthy information. If they are ongoing, they become relatively cheap, and provide useful information about the context of related household characteristics. They tend, however, to lack detail and to underestimate health utilization. Going to insurers and asking for their payments can help, too, although they may give a misleading impression.

--Koffi: We made a survey to estimate people's expenditure to see if cost recovery was possible and appropriate.

--Clifford: I conducted a survey to learn how socioeconomic and geographic groups spend. One problem was whether or not to include the cost of transportation to services.

RE: Information on transport costs is important for your own uses. For comparability with other countries' surveys, best to disaggregate it.

RE and workshop participants discussed technical niceties of questionnaire and survey design for the remainder of the session. RE advised the provision of two or three spaces for people to fill in with the places they had sought health care, rather than the usual one space. This is more consonant with what people actually do. Every adult in each household should be asked the survey questions, since one often can't speak knowledgeably about what the others have done. In collating the results, care must be taken not to count twice expenditures that were cited by two adults. It's best to employ a local person to convert payments in kind into cash value in the appropriate currency scale. The household level of income is an important gauge of affordability of services. Use hospital and provider records to calibrate for underreporting of utilization.

Break

Rannan-Eliya: Using and interpreting health expenditure data

RE introduced the National Health Accounts matrix for tracking total flows of public and private funds in health. It provides data for answering the questions: Are we spending enough? On the

right things? How important are private expenditures? Does government spending contribute to greater equity? Serial matrices reveal the evolution of expenditures over time--for instance, whether the private portion of expenditures is growing in relation to the public portion.

A matrix from South Korea revealed that 2.7% of the gross domestic product went for health care, with the government paying only 13% of this amount. Putting this together with the knowledge that hospitals were underutilized, South Korea concluded that private insurance was not making hospital care available to many people. The government accordingly introduced reforms including subsidized insurance.

A matrix from Jamaica showed that the government paid an unusually high percentage of health care costs. The Jamaicans used this matrix to try to project expenditures forward for 25 years. The predictions were rendered somewhat irrelevant when events contradicted the assumption on which they were made--i.e., a rise in per capita incomes.

RE turned to another technique for analyzing spending. A comparison of housing data with the records of government expenditures makes plain which income groups are actually using subsidies. In Indonesia, this type of study showed that the rich used the most subsidized hospital care. The middle income group used the subsidized health centers most, largely because both were more concentrated in the rural areas. The Indonesians concluded that they were misallocating funds, since the poor got the smallest share of all. Another graph showed that a similar situation pertained in Malaysia.

Afternoon

Christopher Murray: Disability and its measurement

CM, an originator of the disability-adjusted life years concept, described the steps for calculating how many DALYs a country loses to a particular disease. Preliminarily, he noted that the makers of the World Development Report used two separate information systems to estimate the incidence of each disease in each country. These were routinely collected data including hospital and clinic reporting of medical diagnoses; and DHS style data, which applies chiefly to children. In general, the sum of this data fell short of what would ideally be desirable.

The DALY consequences of each disease depend on four indicator variables:

1. The amount of mortality the disease produces: The makers of the WDR used the maximum life expectancies in developed countries (level 26 in the Coale & Demeny West life table) as the standard for calculating the potential years of life lost each time a person died from a disease in any country.

CM remarked that using a standard life expectancy for all countries is fairer than using the actual life expectancy for each. Otherwise, if a disease in a developed country caused the same number



of premature deaths as a second disease in a developing country, the calculations would show that the disease in the developing country caused a much larger loss of potential life. This disease, then, would seem to be a much more important target for research and intervention.

2. The amount of disability the disease produces: The WDR analysts asked a panel of experts to estimate what would be the distribution of impairments and disabilities that would result from 1,000 cases of each important disease. They assigned each sequela a severity ranking on a scale of 1 through 6. The product of this ranking times the incidence of the sequela yielded a single number which represented the loss of ability produced by 1,000 cases of the disease.

CM asked whether the class could think of objections to such ranking of disability.

--Giorgio: Different social and cultural contexts would give different weights to specific disabilities. Also, some infectious diseases last longer when treated.

CM acknowledged both points. The second is particularly relevant when using the scheme to design programs. It means one needs to measure the current disease burden, what the burden would become if all services were stopped, and what the lowest possible burden would be if all money were spent ideally.

An additional drawback to using the scheme is that comorbidity may produce more disability than the sum of the separate contributions of the diseases. Hence, one might underestimate the total burden of disease in the country.

--David Anderson: Did you include social stigma in your calculations?

CM: This would fall into the category of handicap, which we chose not to look at. Handicap is highly variable from country to country. Also, the society-specific aspect of handicap might implicitly put more value on life in a richer country where opportunities are greater.

3. The age distribution of the people who die or have disabling sequelae: All other things being equal, every community acts as if a year lived as a young adult is worth more than a year lived at any other age. Accordingly, when calculating potential years of life lost, the WDR study gave full value to each one that would have been lived at age 25, and only a fraction as much to each one that would have been lived at any other age. They applied parallel weighting in disability calculations.
4. CM noted that age-weighting is controversial. Economists support the idea on the grounds that older and younger people depends on the productivity of young and middle-aged adults. Some people argue that, for humanitarian reasons, life should have equal value at every age.

5. How soon available interventions can lower the impact of disease: The WDR predicates that saving a life this year is worth 10% more than saving a life next year.

CM explained that such time preference is necessary to avoid coming to the conclusion--based on anticipated research results--that one should devote one's entire health budget to the future and ignore those who are currently at risk.

The burden of each disease in each country is calculated by combining the number produced by the four indicator variables with the national incidence of the disease. CM displayed sample work sheets used to estimate disease burden. Mexico, Mozambique, Ghana, Bangladesh, Columbia, Argentina, and Andhra Pradesh (India) are currently preparing or conducting national surveys to estimate disease burden.

Break

Christopher Murray: Illustrative calculations of DALYs from Mexico and Mozambique

CM showed global cause-of-death data from the WDR. This was produced by taking actual data from countries that could supply it, then generalizing to others based on their epidemiologic patterns. With respect to the aggregate number of deaths among females, these estimates diverge significantly from estimates used by the United Nations. An interesting finding was a lack of correspondence between child mortality and adult mortality among males, due to the large number of men who die of intentional and unintentional injuries.

CM projected some examples of data to suggest the flavor of the results gained from applying disability-adjusted life years. As expected, mortality caused more DALY loss in developing countries, and morbidity eliminated more DALYs in developed countries. For example, premature death accounted for 80% of DALY loss in sub-Saharan Africa, and only 50% in the United States. The proportion of loss due to disability in China was surprisingly high at 43%.

Similarly, communicable disease tended to cause more DALY loss in countries early in the epidemiologic transition than those in later stages. The impact of communicable disease in any country also reflects the population's age structure. Noncommunicable diseases eliminate a larger absolute number of DALYs in developing countries than in developed ones, despite their lesser proportional contribution to total DALY loss in developing countries. This is an important observation, since policy makers often do not discuss noncommunicable diseases when setting priorities for developing countries.

CM asked the workshop participants whether the figures for their regions were what they should have expected.

--Giorgio: The impact of nutritional deficiency should be much higher.

CM: This chart only counts malnutrition when it is the direct cause of death. The figures would be greater if it also counted the effect of malnutrition as a risk factor in other diseases that cause death. The problem with trying to measure the contribution of underlying causes beyond the immediate cause of death is that the number of deaths you end up with a lot more causes than deaths--potentially an infinite number of causes for a finite number of deaths.

--Giorgio: You can't ignore underlying causes, though, in your policy making. Interventions to eliminate underlying causes might be the most effective of all.

CM: The World Development Report does contain a table of associated claims on mortality burdens. These figures allow the policy maker to sum up how much improving water and sanitation, for example, will help control a range of water- and sanitation-related conditions.

With respect to malnutrition, the evidence is so far inconclusive as to whether it exacerbates risk of infection or the other way around. The only proven cost-effective nutritional interventions, despite 30 years of research, have been micronutrient supplements to combat specific disease sequelae.

--Azra: The notion of disability as used in calculating DALYs may not reflect all the permanent adverse consequences of malnutrition. For example, what about children who survive but are permanently stunted, or those who suffer cognitive disability?

CM: Short stature isn't necessarily a bad thing in itself. Cognitive disability is factored into the DALYs, although it is difficult to measure.

Interestingly, anthropometric data from Latin America showed that nutritional status worsened during the economic recession of the 1980s. People thought this would signal a rise in mortality, but in fact the DHS showed that mortality stayed level or improved in this period.

--Giorgio: There's no one-to-one mapping of malnutrition and mortality.

CM: In that case, malnutrition is a proxy rather than direct measure of cause of death, and less useful for our purposes. Diabetes is another example. It doesn't cause much DALY loss in itself. Yet a good deal of heart disease has diabetes in the background.

CM identified the theme of the preceding discussion as the great uncertainty that surrounds all the measurements that went into DALY calculations. He gave the example of a country that reported a misleadingly low efficacy of measles vaccine in order to maintain its flow of aid funds. Research is needed to learn the efficacy rates of many interventions--for example, whether is cost effective to supply insulin to people with diabetes.

CM stressed that the WDR is intended to be a tool for policy makers to use pending the results of better data and further research. An interesting aspect of the tables in the WDR is that they often show different breakdowns of disease burden than one would expect. Maternal mortality accounts for only 18% of deaths among reproductive age women in Africa, for example. Hence, programs that focus exclusively on mothers may be missing a lot.

An upcoming special Bulletin of the World Health Organization will provide more specific information on the calculation of DALYs.

### **Wednesday, 8/18**

Dayl Donaldson: Health sector reforms: recent experiences

In preface to her talk, DD synthesized some recent commentators' assessments of the status of public health as follows: "Public health systems cannot continue as they are. They need reform. But reform will not bring improvements." Did workshop participants agree?

--Giorgio: Reforms can improve health status in developing countries, not in Europe. They can make systems in Europe more cost-effective and user-friendly.

--Muna: If we didn't think things could improve, we wouldn't be here.

--Hussein: If we only look at health system reform we won't go anywhere. We need to use health as a criterion and objective for wide-reaching social change.

DD turned to the background of reform, the factors that can push policy makers to decide they need it. Examples include external economic shocks that change the export/import balance, or a fall in health expenditures relative to the Gross Domestic Product. What other factors can workshop participants cite?

--Joyce: Actions of professional groups. For instance, loss of health workers who migrate to take advantage of better opportunities in other countries.

--Paul: Pressure from consumers.

DD: These might result from changes in income, age structure, introduction of new diseases.

--Azra: Pressure from donors.

--Giorgio: Political commitment (people who get power on the basis of promising reforms) and political interest (people who have power and fall in with popular movements to make reforms in order to keep it).

DD showed a table from the World Development Report that distinguishes reforms that seek to institute new policies from reforms whose objective is to improve the administration of current policies. Both types may involve a focus on the environment in which households seek health; improved government investments in health; or facilitation of a better health yield from private sector activities. Reforms bent on improving efficiency often are motivated by a desire to reach more poor people.

Two types of efficiency are relevant when assessing health care systems. Allocative efficiency refers to the right mix of inputs to achieve objectives at minimal cost--for example, the right mix of doctors and nurses to meet case needs. Technical efficiency refers to the minimizing of inputs to produce a given output--for example, giving one drug when possible instead of two.

Based on Grindle and Thomas, DD presented a model of health sector reform that comprises three components:

1. The environmental context includes the attitudes of policy elites whose opinions are crucial to success, as well as the public's positive or negative memories of past reforms or promises of reform.

2. The circumstances around setting the policy agenda depend mainly on whether or not the current situation is conceived as a crisis. In a crisis--for example, in making a decision to float a currency--a greater number of people representing a wider range of interests become involved, the political atmosphere carries a charge, and the decision comes about in a series of discontinuous steps. In a business-as-usual situation--for example, deciding to let doctor keep a part of the fees they collect for government-supported services--bureaucrats follow their usual procedures.

3. The character of the policy itself determines whether or not it is likely to claim public attention. Public awareness can vastly increase the political consequences of decisions.

DD assigned an exercise. Workshop participants divided into the same four groups they have formed for working on the Ghana data project. Each group was asked to consider one typical reform listed in the World Development Report (pages 14, 126) and address the questions: What is the policy? What information will be needed to monitor its impact? Does the need for the policy reflect a crisis situation? Is the policy decision most likely to be made in the public or the bureaucratic arena?

DD assigned each group a type of reform that was in line with their workshop project on Ghana. The privatization group was asked to look at a proposed policy to encourage private financing in the provision of health care, etc. Following short presentations and discussion of the groups' results, DD said she was impressed with what they had accomplished during the short break that was provided for them to do the work. The attention they paid to information needs was particularly impressive; this is an area often neglected in actual policy reform. An interesting upshot of the exercise was the realization of how many policies come about in crisis.

--Giorgio: The model seems to be too general. There isn't enough recognition of the economic interests that play a role in these issues.

DD: The model was made by political scientists. It does suffer from an attempt to be applicable in all sectors.

Break

Dayl Donaldson: Donor-assisted health reform efforts

DD described the characteristic context and intent of four types of financing for health reform: World Bank Structural Adjustment Credits; World Bank Social Dimensions of Adjustment Loans (given in connection with structural adjustment loans to cushion potential adverse social impacts); Bank Projects (may specifically support projects in health or education); USAID projects.

--Clifford: In 1987, the World Bank stopped releasing loan money to Sierra Leone because it found that the data base for health management was insufficient and the peripheral staff were inadequately trained. Sierra Leone made improvements, and the money has now begun to flow again.

DD: The WB often attaches conditions to loans.

--Hussein: Some of these conditions are economic ones that have nothing to do with health. Sometimes governments agree to conditions because they need the money, but can't really meet the conditions. The money stops halfway through and the project fails.

--Koffi: The WB has agreed to fund health sector decentralization in Togo. So far it's only on paper. We also have an AID program to train ministry personnel. AID releases the money as we fulfill conditions. They want us to break the monopoly by pharmaceutical stores, make essential drugs tax free, and allow more drug firms to compete in Togo.

DD presented two examples of AID programs. Niger received the first AID grant for health care reform at a time when its gross domestic product was falling, medical costs were rising, and the fees being charged for services had not changed in 20 years. The agency demanded a large number of changes as conditions for funds to be released. There is no clear relation between the amount the agency invests and what it demands of the country. Niger did 23 studies of cost recovery and then stalled in this effort in the face of public opposition. Overall, the loan program had little effect, and hospitals ended up with a still more disproportionately large share of resources. Debt relief from donor countries gave Nigeria an influx of money which it decided to use to finance decentralization of its health care system.

Overall, case studies suggest that donor-assisted reform has succeeded in some instances and failed in others. Success rates have been lowest in social policy initiatives, suggesting that these are particularly difficult efforts. Good management is always critical.

Few studies have documented the impact of health sector reforms on improving health. Ideas such as privatization, which have much theoretical attraction, need to be proven in practice.

**Thursday, 8/19**

Lincoln Chen: The globalization of health problems

LC called attention to the major sponsoring organizations by referring to their recent products. The World Bank just published the World Development Report on health. WHO and UNICEF jointly held the Alma Ata conference, although their approaches to primary health care subsequently diverged. USAID pays for the DHS surveys, with the underlying motive of wanting to establish an "unmet need for fertility services."

After adding to the list with the help of workshop participants, LC identified the other United Nations agencies that have money to spend--mainly, UNDP, UNICEF, and UNFPA. He made the point that various UN agencies have very different power bases and degrees of autonomy. Interagency politics and quid pro quos are complex; for example, the technical agencies expect the right of first refusal for any business from the funding agencies. Each agency has an institutional goal of growing in size and expanding its mandate.

The present configuration and operation of the UN agencies differs greatly from what the UN founders wished to create. The International Monetary Fund was supposed to oversee the world economy with the aim of preventing any nation from accumulating excessive trade surpluses that could lead to unemployment elsewhere. Today, the G7 countries tell the IMF what to do. The WB was supposed to invest money in developing countries on commercial terms so that they could utilize their abundant resources and cheap labor to quickly improve economically. Instead, the WB, since it has its own charter, simply does what it wants. If the UN Trade Organization functioned as it was originally supposed to, it would have prevented the oil shocks of the 1970s and quite possibly prevented the recent debt crisis of the developing world.

The world lends about \$1,700 billion annually for health. The UN supplies about \$50 billion on health and population, of which about 10% goes through its agencies.

--Clifford: How do USAID and other such agencies fit in?

LC: A combination of private and public sources supplies about \$4.8 billion for international health. Some of the public money goes through bilateral organizations that give aid, such as USAID. Private money mainly flows through nongovernmental organizations. Most of it comes from the US, where the tax structure is conducive to foundations. The Rockefeller Foundation has about \$1.8 billion in the bank, of which it can spend about 5% per year.



Lots of money goes back and forth between agencies, and no one really knows how much ends up in developing countries. The point is, international health is an industry with aspects like those of any other industry. It has lots of flaws, but no one has been able to think of anything better.

LC led workshop participants in a discussion of the problems they've had in dealing with lending agencies.

--Clifford: The problem with agency projects is that countries like Sierra Leone must use the loan money to pay all the costs, including those of hiring people in developed countries with much higher standards of living.

LC: The WB is probably best for overhead. With them, the cost of administration is very small compared to the total amount loaned. With WHO, the proportion of money that actually goes into the developing country is much smaller.

--Joyce: The trouble with AID is that you're required to use their cars. The steering wheels are on the wrong side for Jamaica.

LC: There is no country that doesn't tie aid.

--Hussein: AID is the most strict about having you buy approved products.

LC: The present US administration is stating very explicitly that aid should promote exports. There's lots of politicking, partly because the amounts are large--\$365 for every poor Egyptian, \$2 for every Bangladeshi. Nor are the UN agencies clean in this respect. They incorporate very rigid racial and national requirements in their job descriptions.

--Clifford: One problem we face is time limits for spending money.

--Riti: Once we had money left over from a UN project and wanted to give it back, but we couldn't.

LC: It's not easy to give away money. In Bangladesh if you want to give someone money you have to fill out complicated government papers. You get so you'd rather fly over in an airplane and drop it.

## Friday 8/20

Allan Hill, James Shepperd, Elizabeth Schoenecker, Martin Vaessen:

### Priorities for health sector reform

AH recapitulated the overall objectives and organization of the workshop.

JS identified himself as the AID Cognizant Technical Officer (CTO) for health, whose mission is to keep money flowing and whose goal is to get people to use data to make decisions. His current agenda includes implementing the World Development Report. The activities he oversees include creation of a database by means of DHS, CDC, and national surveys; building capacity in data collection and analysis; analysis of anthropological, economic, political, and other types of data that influence the success of policies; assisting clients in data analysis; policy analysis and development; applying data to advocacy, for example in AIDS care. His department is beginning to address the problems of understanding and dealing with chronic and degenerative diseases, and he expects this to be an increasingly important area of involvement for AID.

ES outlined what she felt will be the next phase of AID international support for population. The agency will emphasize the need for each country to match its population and resources, promoting the health of women and children, and promoting individual rights to choose the number and spacing of children. In published materials, the theme of population/resource matching is most prominent.

The Clinton administration has dramatically changed US policy with regard to family planning and contraception. First, they rescinded the rule against funding programs that offer abortion as part of family planning services. The clear message is that AID and other organizations involved in family planning have leave to link their activities to broader concerns of reproductive health and rights. With this mandate, AID intends to prioritize funding based on a country's number of high-risk births, latent demand for family planning, and the potential for stabilizing population growth through recruiting new users to contraception.

AID has met with the task force on reproductive health and defined areas of concern, including safe fertility control, safe motherhood, freedom from harmful practices, and protection from preventable sequelae of pregnancy and delivery. Women's groups have criticized AID for focusing too narrowly on fertility rates and largely ignoring women's health issues. They want to see more screening and care for sexually transmitted diseases, more abortion care, and more sexual health services. AID is listening, and plans to adopt suggestions in this line.

The questions ES and her colleagues are grappling with include: What is the best way to integrate family planning and health? Is reproductive health the best direction from which to start such integration? How widely or narrowly should reproductive health be defined?

MV located the origins of DHS in a desire to provide a solid database for decision making. He described some of the ways the design and execution of the surveys limit the questions that can profitably be asked. Because DHS uses a random sample frame, for example, there's no point in asking people if their doctor is qualified. Most probably don't know. Child health variables are the focus of the DHS, and here, too, there are constraints on the obtainable information. People can't tell you their children's blood pressure or vitamin status.

The DHS is designed to yield information that is comparable between countries and which can be gathered repeatedly for longitudinal impact studies. For this reason, every national DHS must ask the same main questions in the same way. DHS2 was longer than DHS1, and two countries found that it was too long for their interviewers and respondents to tolerate. AID is attempting to hold DHS3 to the same length as DHS2 while incorporating new issues.

To date, the DHS3 project comprises standard surveys in 30 countries and in-depth surveys in five. Compared to previous DHS projects, the new one will place more emphasis on disseminating its findings. The agency plans to provide participating countries with illustrated plans for analyzing the DHS, and to hold three regional workshops for analyzing the data.

In response to a question from AH, MV revealed that new topics in DHS3 include AIDS and service availability, but not adult health. A survey of husbands will be conducted in Africa.

An open discussion followed.

--Riti [for MV]: DHS needs more questions on knowledge and attitudes. If the present format is too long for one visit, could it not be done in two or three phases?

MV: Multi-round surveys are a good idea. We'd like to do them, but can't afford to. Some countries have used the DHS samples for further surveys.

--Stephen [for ES]: What happens in countries where people's religious or other cultural beliefs conflict with family planning goals?

ES: A program has succeeded in Indonesia, which has a large Muslim population. Another is getting steam up in Egypt. We have seen that family planning can also advance ahead of development.

AH [for ES]: Do you need a vigorous family planning program to get funding from AID?

ES: In what we see coming from the Clinton administration, it appears there have to be signs of progress.

--Clifford [for MV]: What are the criteria for assistance from AID?

MV: That depends on the regional bureau. Health, democratization, and economic development are general guidelines. The tendency now is to limit the number of countries AID will be involved in.

DHS surveys may be given free to countries, or the cost may be shared, or the ministry may pay all. Washington makes this decision.

Workshop participants commented positively on AID's new human rights approach and the decision to try to integrate family planning and health.

#### Official Closing

Cassandra Simmons, HSPH dean of students, made closing remarks. She reiterated the hope that the workshop will be the start of lifelong relationships between the school and the workshop participants.

CS distributed diplomas to the workshop participants and congratulated everyone on their achievements.

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## APPENDIX I - WORKSHOP BROCHURE

Workshop on



# USING DEMOGRAPHIC AND HEALTH SURVEY DATA FOR HEALTH SECTOR REFORM

**Harvard University**

**School of Public Health**

**August 2-20, 1993**

*organized under the auspices of Data for Decision Making*

*a project funded by MD Cooperative Agreement No. DPE-599J-A-OO-1052-OO*

### **The Workshop**

This 3-week Workshop aims to show health professionals how Demographic and Health Survey's (DHS) population-based data can be integrated with information from health facilities (hospitals, clinics and the like) in order to provide a more balanced and informative perspective on health problems and health needs of the population as a whole.

### **Background**

In recent years, many countries have conducted national health interview surveys. Since 1984, USAID has sponsored a major program of demographic and health surveys (DHS) in over 40 developing countries. These surveys collect nationally representative data on many aspects of health, including reproduction and contraception, pregnancy and breast-feeding, immunization, maternal and child anthropometry, and recent morbidity. These internationally comparative surveys are setting new standards for the collection and analysis of such community data on health. But

this information comes in a format unfamiliar to most health professionals who have generally not been faced with the methodological, technical and conceptual issues posed by the analysis of such large survey data sets.

Much of the information available to health planners comes from routine data collection from public-sector health facilities -hospitals, clinics, health centers and physicians' reports. This information is inherently unsatisfactory since it refers only to the portion of the population in contact

with the national health services. In many developing countries, the fraction of the total population regularly using the public health services is very low. How then can health planners make informed decisions for the future when their knowledge of the overall health situation is so imperfect?

### **Aims**

The main aim of the Workshop is to show how information from a diversity of sources can be assembled to provide a sounder basis for decision making and health care reform. In addition, the Workshop has the following more

specific objectives:

- \* to present methods for the assessment of the health and mortality of the whole population;
- \* to provide an introduction to the description of health and ill-health from survey and from health services data;
- \* to show how the coverage and effectiveness of the health services can be measured;
- \* to compare the coverage and usage of the health services provided by the state, by the private sector, and by private voluntary organizations;
- \* to begin the process of identifying national health priorities and starting a program of essential national health research; and
- \* to provide an introduction to the use of health statistics to encourage reform of the health sector.

### **Methods**

The Workshop will emphasize the entire

sequence of activities from data analysis to the use of these analyses to accomplish reforms and change in the health sector. To this end, presenters will describe the conceptual and methodological problems surrounding a particular topic, illustrate the application of appropriate analysis methods, discuss the scientific results and then proceed to show how the analysis might be used in the political arena. This will include the description of case studies, examples of the presentation of data in digestible form for decision makers, and the application of cost-effectiveness and cost-benefit procedures. The Workshop will consist of core lectures, discussion groups and class exercises, and private study and homework. Participants will be expected to analyze existing data from a Demographic and Health Survey (DHS) as well as other materials. Fuller details will be provided upon admission. Some instruction will be provided on the use of micro-computers for data analysis and display.

### **Who should attend**

The Workshop is aimed at those whose main job is the analysis of health and population data for health sector planning. It will be useful to those in national statistical offices as well as those in ministries of health, to researchers in universities and national institutes of health research, to medical people with an interest in public health, and to program officers working with international organizations such as UNICEF and WHO. The participants are expected to have a diploma in a relevant discipline and some years of practical experience in the analysis of national health strategies. No prior knowledge of the analysis of national demographic or health surveys is assumed. A computing clinic will be part of the Workshop but as this is an analysis workshop and not a computer course, participants will be expected to have some prior computing skills and to be able to solve most common problems themselves.

## APPENDIX II - WORKSHOP TIMETABLE

### Using Demographic and Health Survey Data for Health Sector Reform

Room 213, Kresge Hall  
Harvard University School of Public Health  
August 2-20, 1993

#### Timetable

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#### Sunday, August 1

7:00 pm Informal get-together, Common Room, Vanderbilt Hall

#### Week 1

#### Measuring Mortality, Morbidity, and Health

#### Monday, August 2

8:30 am Registration and administrative matters, including travel, accommodation and financial affairs

9:30 am Official opening. Greetings from Fineberg, Chen, Walsh, and Hill

10:45 am Introduction to the Workshop: aims, schedule, materials. Why are we here? What products do we expect? (Hill, Gardner, and Nyhagen)

1:30 pm Library tour (tentative)

2:00 pm Administrative affairs: I.D. cards, banking, etc.

3:15 pm SESSION 1: Discussion of national context of health care provision (Hill, Walsh, and participants)

6:30 pm \*Computer practice (optional): DOS, file management, etc. (Gardner and assistants)

### **Tuesday, August 3**

- 9:00 am      SESSION 2A: Measuring mortality when vital registration is inadequate (Hill)
- 10:45 am     SESSION 2B: The DHS approach to the measurement of mortality (Hill)
- 1:30 pm      \*Introduction to Instructional Computing Facility; computer exercise: DHS on the computer: basic principles (files, DHSPAK, PKZIP/UNZIP, etc.)
- 3:15 pm      \*Computer exercise (continued)
- 6:30 pm      \*Computer practice: WordPerfect word processing (optional)

### **Wednesday, August 4**

- 9:00 am      SESSION 3A: Health interview surveys: methods and results (Hill)
- 10:45 am     SESSION 3B: Implementation of health sector reform: political mapping (Reich)
- 1:30 pm      SESSION 3C: Health delivery systems and health outcomes (Walsh)
- 3:15 pm      \*Computer exercise
- 6:30 pm      \*Computer practice (optional)

### **Thursday, August 5**

- 9:00 am      SESSION 4A: The DHS approach to the measurement of morbidity (Hill)
- 10:45 am     SESSION 4B: Case study on political mapping: worms, children, and school health in Ghana (Reich)
- 1:30 pm      SESSION 4C: Discussion of possible projects and products (Hill and participants); Progress report: Measuring the impact of MCH services (Cardenas)
- 3:15 pm      \*Computer exercise
- 6:30 pm      \*Computer practice (optional)



## **Friday, August 6**

- 9:00 am SESSION 5A: Selection of nutritional status indicators for different public health purposes (Peterson)
- 10:45 am SESSION 5B: Anthropometric data: commonly used indices and their interpretation (Peterson)
- 1:30 pm SESSION 5C: Use of low birthweight as a nutritional status indicator (Peterson)
- 3:00 pm Departure for harbor cruise

## **Week 2**

### **The Determinants and Consequences of Health Service Use**

## **Monday, August 9**

- 9:00 am SESSION 6A: Characteristics, sources quality, and interpretation of nutritional status data (Peterson)
- 10:45 am SESSION 6B: Relationships among DHS nutritional and health indicators (Peterson)
- 1:30 pm \*Computer exercise: nutritional status
- 3:15 pm \*Computer exercise, project work, or use of MEDLINE, POPLINE, etc.
- 6:30 pm \*Computer practice (optional)

## **Tuesday, August 10**

- 9:00 am SESSION 7A: Differentials in health and mortality by social class (Das Gupta)
- 10:45 am SESSION 7B: Comparative studies of differentials in health status and health service utilization (Hill)
- 1:00 pm Group picture: Kresge steps
- 1:30 pm SESSION 7C: The demand for health care: concepts, curative vs. preventive care, applications of models for analysis of demand and

- relevance for the DHS, and what we've learned from existing studies  
(Rose)
- 3:15 pm Demand for health care (continued)
- 6:30 pm Computer practice (optional)

### **Wednesday, August 11**

- 9:00 am SESSION 8A: Community health profiles: the lessons from longitudinal studies (Wyon)
- 10:45 pm SESSION 8B: Insights and key indicators for the management of community health programs (Wyon)
- 1:30 pm SESSION 8C: Water and sanitation projects: outcome and process measures compared (Cash)
- 3:15 pm Computer exercise - Discussion of computer variables & tables needed for reports: in 213
- 6:30 pm \*Computer practice

### **Thursday, August 12**

- 9:00 am SESSION 9A: Concepts of good health: impairment, disability & handicap (Brown)
- 10:45 am SESSION 9B: International experience with disability measures (Brown)
- 1:30 pm SESSION 9C: Group presentations of progress (20-30 minutes maximum)
- 3:15 pm SESSION 9D: Susan Yazdgerdi - tips on statistical analysis, followed by work on reports - analysis, writing - ICF or elsewhere
- 6:30 pm \*Computer practice

### **Friday, August 13**

- 9:00 am SESSION 10A: Reproductive health (Snow and Aitken)
- 10:45 am SESSION 10B: Interventions to improve reproductive health (Aitken and Snow)

- 1:30 pm SESSION 10C: Group work on the measurement of the use and impact of health services on health and mortality: identification of issues and planning analysis (Hill)
- 2:45 pm Shuttle to Cambridge for Tour of Cambridge campus, Population Center
- 6:30 pm Barbecue at Allan Hill's home, Cambridge

**Week 3**  
**Achieving Health Sector Reform**

**Monday, August 16**

- 9:00 am SESSION 11A: The World Bank approach to health (Musgrove)
- 10:45 am SESSION 11B: The optimal package of health services (Musgrove)
- 1:30 pm SESSION 11C: Who delivers the services? Who pays? (Musgrove)
- 3:15 pm SESSION 11D: Research and evaluation needed (Musgrove)
- 6:30 pm \*Computer practice

**Tuesday, August 17**

- 9:00 am SESSION 12A: Methods of measuring health expenditures (Rannan-Eliya)
- 10:45 am SESSION 12B: Using and interpreting health expenditure data (Rannan Eliya)
- 1:30 pm SESSION 12C: Disability-adjusted life years (Murray)
- 3:15 pm SESSION 12D: Illustrative calculations of DALYs from Mexico and Mozambique (Murray)
- 6:30 pm \*Computer practice

**Wednesday, August 18**

- 9:00 am SESSION 13A: Health sector reform: recent experiences. Major elements of reform in finance, organization, health needs, etc (Donaldson)
- 10:45 am SESSION 13B: Recent experiences with priority setting, insurance, users fees, and community organization (Bamako initiative) (Donaldson) ..

1:30 pm Report writing and preparation

3:15 pm Report writing and preparation

6:30 pm \*Computer practice (optional)

### **Thursday, August 19**

9:00 am SESSION 14A: The globalization of health and population issues: problems in restructuring the health and population sector in developing countries (Chen)

10:45 am (continued)

1:30 pm Report writing and preparation

3:15 pm Report writing and presentation by the four working groups

6:30 pm \*Computer practice

### **Friday, August 20**

9:00 am SESSION 15A: Presentation of reports: executive summaries from four working groups

10:30 am SESSION 15B: Round table discussion on "Priorities for health sector reform" (Hill, Vaessen, Shepperd, Schoenecker)

12:00 pm Presentation of certificates and closing ceremony (Simmons, Hill)

12:30 pm Buffet lunch (Room 101 Kresge, next to cafeteria)

Departure of participants

Note: There will be short breaks at 10:30 am and 3:00 pm. Lunch will be from 12:15 pm to 1:30 pm. Afternoon sessions will end at 4:45 pm.

\*Indicates session held in computer laboratory.

### APPENDIX III - LIST OF READINGS CIRCULATED

#### Allan Hill

- Adjei, S. 1989. Meaning of Morbidity Measures in the Third World. *Health Interventions and Mortality Change*. 477-482.
- Cairncross, A. M. 1990 Health Impacts in Developing Countries: New Evidence and New Prospects. *Journal of the Institution of Water and Environmental Management*, 4(6):571-577.
- David, P., H.L. Bisharat and S. Kawar. 1991. Using Routine Surveys to measure mortality: A tool for programme managers. *Social Science Medicine* 33:309-319.
- Ewbank, D. C. 1984. Uses of mortality data for evaluating the success of specific health and development programmes. *Data bases for mortality. UN Population Studies*, No. 84. 18-30.
- Garcia, M. and K. Peterson. 1993. *Intergenerational Nutrition: Exploring the Relationships Of Low Birth Weight, Childhood Growth Failure, and Women's Nutrition in Developing Countries*. Boston: International Food Policy Research Institute and Harvard School of Public Health.
- Ghana Statistical Service. 1989. *Ghana Demographic and Health Survey 1988*. Columbia, Maryland USA: Institute for Resource Development/Macro Systems, Inc.
- Hill, A. G. and A. Aguirre. 1990. Childhood Mortality Estimates using the Preceding Birth Technique: Some Applications and Extensions. *Population Studies* 44:317-340.
- Hill, A. G. and N. Dollimore. 1991. Assessing the impact of health programmes using household surveys in Mali. *Health Policy and Planning*; 6(4). 336-347.
- Hill, A. G. and S. Macrae. 1985. Measuring childhood mortality levels: A new approach. *UNICEF Social Statistics Bulletin* 8:21-15.
- Hill, K. 1991. Approaches to the Measurement of Childhood Mortality: A comparative review. *Population Index* 57:368-382.
- Lengeler, C.D., M. Sala-Diakanda, and M. Tanner. 1992. Using questionnaires through an existing administrative system: a new approach to health interview surveys. *Health Policy and Planning* 7(1):10-21.

- Preston, S. H. Resources, knowledge and child mortality: A comparison of the US in the late nineteenth century and developing countries today. *Resources, Knowledge, and Child Mortality* 66-78.
- Riley, J. C. 1992. From a high mortality regime to a high morbidity regime: is culture everything in sickness? *Health Transition Review* 2(1):71-89.
- Riley, J. C. 1990. The risk of being sick: Morbidity trends in four countries. *Population and Development Review* 16(3):403-432.
- Ross, D. A. and Vaughan J. P. 1986. Health interview surveys in developing countries: A methodological review. *Studies in Family Planning* 17:278-94.
- Taylor, C. E. 1992. Surveillance for equity in primary health care: Policy implications from international experience. *International Journal of Epidemiology* 21(6):1043-1049.
- University of Dar es Salaam and The World Bank. Afya na maendeleo Kagera health and development survey Household Questionnaire Wave 1 Section 6.
- United Nations. 1991. Guidelines for household surveys on health. New York: National Household Survey Capability Programme, Department of Technical Co-operation for Development and Statistical Office.
- United Nations Secretariat. Approaches to the collection of mortality data in the context of data needs. 33-44.
- van Ginneken, J. K. 1989. Measurement of morbidity and disability with cross-sectional surveys in developing countries. 483-497.
- World Health Organization. 1992. WHO/UNICEF consultation of the measurement of overall and cause-specific mortality in infants and children, Meeting Report Executive Summary. Geneva: 15-17 December 1992.

### **Julia Walsh**

- Frenk, J. 1993. The health-care transition: Concepts and policies on the dynamics of health systems. Draft Manuscript.

### **Rachel Snow/ Iain Aitken**

- Maine, D. 1989. Safe Motherhood Programs: Options and issues. Columbia University.
- Winikoff, B. 1988. Women's health: An alternative perspective for choosing interventions. *Studies in Family Planning* 19(4):197-214.

## **Michael Reich**

Bundy, D.A.P. and A. Hall. 1992. Report of a Workshop, Ghana Expanded Programme of Chemotherapy, Accra, Ghana: 27-28 July 1992.

Bundy, D.A.P. and A. Hall. Partnership for Child Development: An international programme to improve the health and education of children through school based services.

Ghana Ministry of Education, Ghana Ministry of Health, Task Force for Child Survival and Development. 1992. Report of a Workshop, Ghana Expanded Programme of Chemotherapy, Accra, Ghana: 11-12 February 1992.

Hopkins, D. Ghana Expanded Programme of Chemotherapy.

Reich, M. R. 1993. Political mapping of health policy: Draft Guidelines. Boston: Harvard School of Public Health, March 1993.

Reich, M. R. The Political Economy of Health Transitions. In Health and Social Change, L. Chen et al., Eds, forthcoming.

Worms, children and school health in Ghana: Chemotherapy and partnerships for child development.

## **Dayl Donaldson**

Donaldson, D. S. 1993. Health sector reform in Africa, lessons learned to date. Boston: DDM/HSPH.

Grindel, M. S. and J. W. Thomas. 1991. Public Choices and Policy Change, the political economy of reform in developing countries. Baltimore, Maryland USA: Johns Hopkins University Press.

World Bank. 1993. World Development Report, 1993. Washington DC: World Bank, Overview and Chapter 7.

## **Karen Peterson**

Beaton, G. A. Kelly, J. Kevany, Martorell, J. Mason. 1989. Appropriate uses of anthropometric indices in children. Geneva: ACC/SCN State-of-the-Art Series Nutrition Policy Discussion Paper No. 7.

Centers for Disease Control. 1988. Guidelines for evaluating surveillance systems. *Morbidity and Mortality Weekly Report*, U.S. Department of Health and Human Services, Public Health Service, Epidemiology Program Office, Division of Surveillance and Epidemiologic Studies, Vol. 37, No. S-5, Atlanta, Georgia USA.

Garcia, M., J. Mason. 1992. *Second Report on the World Nutrition Situation. Volume I: Global and Regional Results*. Geneva: Administrative Committee on Coordination/Subcommittee on Nutrition (ACC/SCN), c/o World Health Organization.

Garcia, M. 1992. *Second Report on the World Nutrition Situation. Volume II: Country Trends Methods and Statistics*. Geneva: Administrative Committee on Coordination/Subcommittee on Nutrition (ACC/SCN), c/o World Health Organization.

Gayle, H.D., M. J. Dibley, J. S. Marks, F. L. Trowbridge. Malnutrition in the first two years of life: The contribution of low birth weight to population estimates in the United States. *American Journal of Diseases of Children* 141(5):531-534.

Kim, I., D. W. Hungerford, R. Yip, S. A. Kuester, C. Zyrkowski, F. L. Trowbridge. 1992. Pregnancy nutrition surveillance system--United States, 1979-1990. *CDC Morbidity and Mortality Weekly Report* 41 (SS-7):25-41, November 27, 1992.

Sauerborn, R., J. C. Minet, R. M. Ouiminga, B. Kone, R. Sama, S. Kanyel, Z. Ebrahim, D. Morley. 1992. Validity of maternal and neonatal indicators of low birth weight. *Nutrition Research* 12:307-320.

Serdula, M. Sk. et al. 1987. Validity of clinic-based nutritional surveillance for prevalence estimation of undernutrition. *Bull WHO* 65(4):529-533.

United Nations, ACC/SCN. 1989. Suggested approaches for nutritional surveillance for the Inter-Agency Food and Nutrition Surveillance Program. *Food and Nutrition Bulletin* 11(2):62-73.

United Nations, ACC/SCN. 1992. *Assessing, Analyzing and Monitoring Nutrition Situations*. Geneva: ACC/SCN.

WHO Working Group. 1986. Use and interpretation of anthropometric indicators of nutritional status. *Bull WHO* 64(6):929-941.

### **Laura Rose**

Akin, J. S., C. C. Griffin, D. K. Guilkey, B. M. Popkin. 1985. *The demand for primary health services in the third world*. Totowa, New Jersey USA: Rowman & Allanheld Publishers. Chapters Three and Four, 55-131.



McPake, B. 1993. User charges for health services in developing countries: A review of the economic literature. *Social Science Medicine* 36(11):1397-1405.

Mach, E. P., B. Abel-Smith. 1983. *Planning the finances of the health sector: A manual for developing countries*. Geneva: World Health Organization. Chapters 2 and 5, 15-19 and 39-69.

### **Ravi Rannan-Eliya**

Griffiths, A. and M. Mills. Health sector financing and expenditure surveys. In *The economics of health in developing countries*. 43-63.

### **Richard Cash**

Blum, D., R. N. Emeh, S. R. A. Huttly, O. Dosunmu-Ogunbi, N. Okeke, M. Ajala, J. I. Okoro, C. Akujobi, B. R. Kirkwood, and R. G. Feachem. 1990. The Imo State (Nigeria) drinking water supply and sanitation project, 1. Description of the project, evaluation methods, and impact on intervening variables. *Transactions of the Royal Society of Tropical Medicine and Hygiene*, 84:309-315.

Cairncross, A. M. 1990. Health impacts in developing countries: New evidence and new prospects. *Journal of the Institution of Water and Environmental Management*, 4(6):571-577.

Esrey, S. A., J. B. Potash, L. Roberts, and C. Shiff. 1991. Effects of improved water supply and sanitation on ascariasis, diarrhoea, dracunculiasis, hookworm, infection, schistosomiasis, and trachoma. *Bulletin of the World Health Organization*, 69(5):609-621.

Levine, R. J., S. D'Souza, M. R. Khan, D. R. Nalin. 1976. Failure of sanitary wells to protect against cholera and other diarrhoea in Bangladesh. *The Lancet*, July 10, 1976:86-89.

### **Susan Yazdgerdi**

Curtis, S. L., I. Diamond, J. W. McDonald. 1993. Birth interval and family effects on postneonatal mortality in Brazil. *Demography*, 30(1):33-43.

Farah, A, S. H. Preston. 1982. Child Mortality Differentials in Sudan. *Population and Development Review* 8(2):365-383.

Outline: Ecologic/Correlation Study (Aggregate or descriptive study): Population level analysis to determine the extent to which two characteristics are related.

**Scott Campbell Brown**

Brown, S. C. 1993. What constitutes good health? Proceedings of the IUSSP General Conference, Montreal, Vol. 1, 499-519.

Brown, S. C. 1993. Health expectancy values in developing countries: Ethiopia as a case study. In Calculation of health expectancies: harmonization, consensus achieved and future perspectives. Robine, J.-M., C. D. Mathers, M. R. Bone, I. Romieu. Colloque INSERM/John Libbey Eurotext Ltd., 226:331-357.

## APPENDIX IV - PARTICIPANT PROFILES AND ADDRESSES

### Workshop on Using Demographic and Health Survey Data for Health Sector Reform

#### Participant Profiles

##### Dr. Koffi Agbekou

**Country:** Togo

**Degrees:** MD, University of Benin, 1980; MPH, Univ. of Oklahoma, 1989

**Current Position:** Health/Population Specialist/USAID/Togo

**Reason for attending workshop:** to enable to work effectively under the AID Mission's health reform program in Togo and contribute to the use of past and future DHS results for decision making in health and population areas in Togo

##### Ms. Riti Ahsan

**Country:** Bangladesh

**Degrees:** MS, PIH, Harvard, current; MSc. Statistics, Dhaka Univ., 1974; B.Sc. Statistics, Dhaka Univ., 1973; Training in Economics Statistics, US BUCEN, 1983

**Current Position:** Deputy Director, Bangladesh Bureau of Statistics

**Reason for attending workshop:** Has been involved in planning three child nutritional assessment surveys, preparing and pre-testing the questionnaire, selecting and training enumerators, choosing anthropometric equipment, supervising data collection and cleaning, and participating in data analysis and report writing. Wants to build up ability to analyze health data.

##### Ms. Muna Idris Al-Daoud

**Country:** Jordan

**Degrees:** BSc Computer Science, University of London, 1988; MSc Management Science, University of Southampton, 1990

**Current Position:** Senior Programme Assistant, UNICEF

**Reason for attending workshop:** Recently joined the UNICEF team. Work related to the interpretation of health and demographic data and the assessment of various health indicators.

##### Dr. Luciano Correia

**Country:** Brazil

**Degrees:** MD, Federal Univ. of Ceara, 1983; MSc., Maternal and Child Health, Institute of Child Health, Univ. of London, 1988

**Current Position:** Assistant Professor, Dept. of Community Health, Federal University of Ceara

**Reason for attending workshop:** To improve technical skills in data analysis and its use for health planning and management. Intends to work together with the central level managers of the State of Ceara Secretariat of Health (SSH) in order to apply new approaches in data analysis and its use that he will obtain at the workshop.

##### Mr. Boris Denisov

**Country:** Russia

**Degrees:** Certificate, Management, IESE, Barcelona, 1992; Degree, Demography, Moscow Univ., 1989; Diploma, Economics, Moscow Univ., 1980

**Current Position:** Lecturer, Population Studies Center, Louisnosov (Moscow) Univ., Senior

Researcher, State Committee on Statistics

**Reason for attending workshop:** Currently going to carry out the multilateral project on demographic consequences of the Chernobyl disaster (Belarus, Russia, and Ukraine). A survey of the contaminated areas' population is planned within the framework of the project.

Dr. Azra Hashmi

**Country:** Pakistan

**Degrees:** MPH, IH, HSPH, 1993; MCPS, Pediatrics, College of Physicians and Surgeons, Karachi, 1990; DCH, Pediatrics, PGMI, Lahore, 1989; MBBS, FIMC, Lahore, 1983

**Current Position:** Student, HSPH

**Reason for attending workshop:** Taken as part of course requirements at SPH

Dr. Stephen Hendricks

**Country:** South Africa

**Degrees:** DDS, Dentistry, Univ. of West Cape, 1978; Diploma, Dental Public Health, Univ. of London, 1985; MSc. Community Dentistry, Univ. of London, 1986; MPH, Public Health, HSPH, 1990

**Current Position:** Visiting Scholar, Epidemiology and Public Health, Harvard, Doctoral Candidate

**Reason for attending workshop:** To increase skills in demographic analysis required for later analysis and a fundamental component for dissertation research. To become acquainted with methods for the assessment of health and mortality of the whole population of South Africa, to develop skills in piecing together components from different surveys and arrive at best estimates which would then be used for making projections which are reasonable and consistent with the demography of the whole country. Lead to setting of appropriate national health priorities and encourage reform in the health sector.

Dr. Clifford Kamara

**Country:** Sierra Leone

**Degrees:** MD, Kharkov, USSR, 1972; MPH, Royal Tropical Inst., Amsterdam, 1987

**Current Position:** Head, Planning Management information and statistics unit, Department of Health and Social Sciences, Government of Sierra Leone

**Reason for attending workshop:** As head of the unit responsible for the national health information system, expects to benefit in regards to all aspects of data collection, storage, analysis, distribution and use at all levels of the health care delivery system

Dr. Komla Kutowogbe

**Country:** Togo

**Degrees:** MPH, Health Services, Boston Univ., 1991; Certificate, Health Care in Developing Countries, BU, 1991; Certificate, Management Method Int. Health, BU, 1991; MD, Univ. of Dakar, 1980

**Current Position:** Chief Division Planning/Programming, Ministry of Health and Population

**Reason for attending workshop:** To be enabled to better contribute to health sector planning and decision making based on DHS data.

Dr. Ndola Prata Menezes

**Country:** Angola

**Degrees:** MD, General Medicine, University of Angola (1989); Demographic Analysis, CELADE Cost Rica (DTCD/FNUAP) (1990)

**Current Position:** UNDP consultant for training in Statistics Methods, in their project with Angolan

National Statistics Institute. In Statistics Department in Ministry of Health she is responsible for the reformulation of the Information System for Medical Primary Assistance.

Mrs. Tabitha Langeni-Mndebele

**Country:** Botswana

**Degrees:** PhD., Canada, current; MSc, Medical Demography, LSHTM, 1992; MA, Pop Studies, Ghana, 1988; BA, English and French, Univ. of Botswana, 1987; Diploma in French, CAVILAM, 1984

**Current Position:** Lecturer, University of Botswana, Dept. of Demography

**Reason for attending workshop:** to strengthen knowledge and capability to teach and do research in Demography. She wishes to alleviate the problem of heavy reliance on foreign expertise and localize the Botswana Univ. staff.

Dr. Sandra Brandao Luna

**Country:** Brazil

**Degrees:** MD, Federal Univ. of Bahia, 1975; Cytology, Colposcopy, Public Health courses from 1979-1987; Certificate, Pulic Planning, SESAB/FUNDESPA, 1989

**Current Position:** Technical Planning Advisor to State Secretariat of Health (Bahia), SESAB

**Reason for attending workshop:** Professional motivation, sharing the knowledge and skills acquired with colleagues, applying skills to work as a planning advisor to the health programs carried out by the State Secretariat with the expectation to identify problems and propose measures to resolve them, offer opportunity to evaluate diverse programs to be presented by fellow participants as well as to discuss alternatives to be presented to SESAB officials with regard to subjects covered in the workshop.

Dr. Reuben Mboge

**Country:** The Gambia

**Degrees:** MB, BCH, Medicine, Cairo Univ., 1978; MPH, Public Health, Johns Hopkins, 1991; Certificate, Reproductive Health, Shatby Univ. Hospital, 1985; Certificate, Family Planning, Debrecen Med. School, Hungary, 1983; Certificate, VSC, AVSC Centre, Kenya, 1991

**Current Position:** Senior Medical Officer-in-Charge of Maternal and Child Health and Family Planning Services, Ministry of Health and Social Welfare, the Gambia

**Reason for attending workshop:** opportunity to refresh knowledge and to acquire additional knowledge and skill relevant to work. Provide a focal point that will serve to stimulate interest in the utilisation of Health and Demography Survey Data in the Ministry of Health. Ministry of Health is going through a period of restructuring and reform to improve efficiency and the quality of Health services.

Dr. Hussein Mursal

**Country:** Somalia

**Degrees:** MPH, Leeds Univ., 1990; MD, Somali National University, 1979

**Current Position:** Health Coordinator, Save the Children Fund (UK)

**Reason for attending workshop:** planning to work for future Somali government, wishes to be empowered with the tools needed in the setting up of a system where data collected are properly analyzed so that an effective plan for the rehabilitation can be forwarded.

Dr. Justin Ndoyo

**Country:** Central African Republic

**Degrees:** MD, University of Bangui, 1982; MPH&TM, Tulane, 1990

**Current Position:** Director of Preventive Medicine, Ministry of Public Health

**Reason for attending workshop:** will provide with a strong basis for decision making and evaluating the different programs in which he is involved as the National Coordinator of many health projects.

Dr. Molefi Paul Sefularo

**Country:** South Africa

**Degrees:** MBChB, Medunsa, 1985; DTM&H, Tropical Medicine, WITS Univ., 1988; DPH, Public Health, WITS Univ., 1990; DHSM, Health Service Management, WITS Univ., 1992

**Current Position:** Lecturer/Registrar, Dept. of Community Health, Medical School, University of Witwatersrand

**Reason for attending workshop:** intends to use the skills acquired through the course to contribute meaningfully to the restructuring of the health care system in South Africa into a more equitable one. Hopes to contribute at the national level and also in the Western Transvaal region.

Dr. Giorgio Tamburlini

**Country:** Italy

**Degrees:** M.D., Trieste, 1975; MSc. Pediatrics, Trieste, 1978; Epidem. Cert., Milan 1981;

**Current Position:** Lecturer, International Child Health, Trieste; Head, Bureau for International Cooperation in Maternal and Child Health (WHO collaborating centre), Istituto per l'Infanzia, Trieste, Italy

**Reason for attending workshop:** To acquire knowledge about collection, analysis and interpretation of data from DHS, and their appropriate use for policy and planning purposes. Also to get a general idea of what is currently going on at HSPH and to share experiences with professionals from other countries, concerning broader issues in public health in developing health systems.

Mr. Peter Thumbi

**Country:** Kenya

**Degrees:** Cert., Statistics, Tanzania, 1974; Grad Cert., Statistics, Polytechnic London, 1979; Post Grad. Dip., Statistics, Makerere University, Kampala, 1987; B. Phil, Econ, Univ. of Nairobi, 1992

**Current Position:** Assistant Director of Population, National Council for Pop. and Development

**Reason for attending workshop:** Currently coordinating the on-going Kenya Demographic and Health Survey. Wants to learn how to translate the KDHS results into meaningful and workable policies.

Ms. Joyce Vincent

**Country:** Jamaica

**Degrees:** Cert., Social Work, UWI, 1968; BSc, Social Work, UWI, 1973; Certificate, Health Planning, Johns Hopkins, 1979; MA, Community Health, Liverpool Sch. of Tropical Medicine, 1984

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**Degrees:** Master Agronomy, Univ. of Benin, 1987; Agronomist, Univ. of Benin, 1988

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**Workshop on  
Using Demographic and Health Survey Data for Health Sector Reform**

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## APPENDIX V - WORKSHOP PROFESSIONAL STAFF

**Iain W. Aitken, B.A., MB, BCHIR, M.P.H., D.C.M.T.**

**Lecturer on International Health in the Faculty of Public Health**

Extensive international experience in Africa and Asia with maternal and child health programs. Current research interests include: the identification of risk factors; the development of appropriate technologies and their application; district health management and the training of managers; and the design and financing of urban health care systems in developing countries.

**Scott Campbell Brown**

**Educational Research Analyst, Dept. of Education, Office of Special Education and Rehabilitative Services**

Data analyst with primary experience using US data. Overseas experience includes health survey in Ethiopia. Researches on the interpretation of morbidity data from health interview and health examination surveys.

**Rosario Cardenas, M.D., M.Sc., DS**

**Research Assistant, Population and International Health**

Works on adult mortality, utilization of maternal health care services in Mexico, modelling demographic impact of AIDS epidemic, a conceptual and bibliographical analysis of abortion, familial multimortality, use of the years of potential life lost indicator in the comparative measurement of mortality by sex and cause in selected states and Mexico, construction of life tables for the analysis of changes in infant mortality in Mexico between 1933-1975.

**Richard A. Cash, B.S., M.D., M.P.H.**

**Lecturer on Tropical Public Health in the School of Public Health**

**Institute Fellow in the Harvard Institute for International Development**

Principal investigator for the Applied Diarrheal Disease Research Project at the Harvard Institute for International Development, relief efforts involving both man-made and natural disasters, the health impact of low-intensity war.

**Lincoln C. Chen, B.A., M.D., M.P.H.**

**Chairman, Population and International Health in the Faculty of Public Health**

From 1970-1980, he worked in Bangladesh with the International Center for Diarrheal Disease Research and for the Ford Foundation for India, Nepal and Sri Lanka from 1981 - 1987. Chen advises many international organizations including the Ford, MacArthur and Rockefeller Foundations, the World Bank, the World Health Organization, UNICEF and the United Nations University.

**Dayl S. Donaldson, B.A., ScD., M.A., M.P.H.**

**Economist**

Has worked in Cameroon, Jamaica, Mali, Pakistan, Philippines, Tunisia, and Niger. Works on the costs and financing of international health projects.

**Monica Das Gupta, B.Sc., M.Sc., Ph.D.**

**Adjunct Associate Professor of Population Sciences in the Faculty of Public Health**

Interests in anthropological and demographic studies of the behavioral aspects of health and reproduction, child survival, nutrition, aging, and gender issues. Current research includes a study of the determinants of intrahousehold nutritional allocations, a study of death clustering and related analysis of the pathways that connect female autonomy to child survival.

**Robert Gardner, B.A., M.A. Ph.D.**

**Lecturer , Harvard University School of Public Health**

Included among his research interests are basic demographic methodology, migration (facts, determinants, consequences, decision making, policy), U.S. immigration, particularly from Asia, and Asian Americans and their demography and adaptation. From 1974-1992 he was a Research Associate at the East-West Population Institute in Honolulu, Hawaii and also held the position of Assistant Director for Professional Education there from 1990-1991 and Assistant Director for Graduate Study from 1991-1992.

**Allan G. Hill, B.A., Ph.D., M.A.**

**Andelot Professor of Demography in the Faculty of Public Health**

**Director of Graduate Studies, Dept. of Population Sciences**

Professor Hill includes among his interests the evaluation of health programs in the Third World, particularly the assessment of the effects of diarrheal disease and malaria control programs in Africa and the Middle East. His current work is focused on the development of simple measurement techniques for health workers and experiments with the combination of family planning and immunization programs.

**Christopher Murray, A.B., Ph.D., M.D.**

**Assistant Professor of International Health Economics in the Faculty of Public Health**

**Clinical Fellow in Medicine**

Interests include: Tuberculosis Control Strategies; cost-effectiveness of different diagnostic and treatment strategies; differential access to care and outcome; studies on alternative village based ongoing field sites in Botswana, Bolivia and China. Health Transition: Studies on cause of death patterns and trends in Eastern Europe and developing countries; adult health issues in developing countries; Africa health transition in sub-Saharan Africa.

**Phillip Musgrove,**

**Senior Economist, The World Bank**

**Karen Peterson, D.Sc.**

**Assistant Professor of Nutrition, Department of Maternal and Child Health, Harvard School of Public Health**

Overseas experience in Asia, Africa, and Latin America. Interests include: nutrition status assessment, anthropometric measures, links with maternal and child health, and micro-nutrient studies.

**Ravindra Rannan-Eliya, B.A., M.A., M.D., M.P.H.**

**Research Associate, Harvard School of Public Health, Data for Decision Making Project**

Interested in cost-effectiveness of health interventions, especially in the Indian sub-continent.  
Doctoral research underway.

**Michael R. Reich, B.A., A.M., Ph.D.**

**Professor of International Health in the Faculty of Public Health**

Professor Reich's research interests include the political economy of health policy especially for pharmaceuticals, environmental and occupational health, and Japanese health policy. He also directs the Takemi Program in International Health, a research program that hosts mid-career professionals from governments, universities, and private organizations from throughout the world.

**Laura Rose, B.A., M.S., S.D. (Candidate)**

Major fields are Health Economics and International Health Care Financing. Her current research includes comparative health financing systems, health care simulation modeling, decentralization, and health insurance in developing countries. Since 1991 she has held the position of Health Economist on the Cyprus Project which is a part of the Program in Health Care Financing at Harvard University. She has consulted and lead investigations for the Hinduja Harvard Programme for Community Health in Bombay, India, UNICEF, Amman, Jordan.

**Rachel Snow, B.A., Sc.D.**

**Assistant Professor of Reproductive Health in the Department of Population Sciences**

Reproductive physiology, with emphasis on estrogen dynamics in women; interactions of diet, body composition and estrogen metabolism, and the significance of these factors in subfecundity and breast cancer; population variability in steroid pharmacokinetics, and implications for contraceptive effectiveness and side effects; responsiveness of contraceptive policy to the biomedical characteristics of a population.

**Julia A. Walsh, B.A., M.D., D.T.P.H.**

**Lecturer, Population and International Health**

**Director, Data for Decision Making Project**

Professor Walsh specializes in epidemiology and public health, in addition to internal medicine and infectious diseases. Her major research areas are establishing priorities and using data to inform decision-making in developing countries, cost-effectiveness analysis, vaccines and their impact on infectious disease epidemiology and maternal and perinatal health. She is the director of the Data for Decision-Making Project funded by the U.S. Agency for International Development to assist selected developing countries to manage health sector reform.

**John Wyon, M.D., Ph.D.**

Author of the Khanna study in Punjab, India. Extensive international experience with the establishment and management of community health projects. Long working experience with NGOs in international health.

## APPENDIX VI - PARTICIPANTS' FINAL REPORTS/EXECUTIVE SUMMARIES

### PARTICIPANTS' FINAL REPORT

In the Introduction, we indicated that some of the Workshop's aims were:

- to send participants home with a clear idea of how to undertake studies of public health and its main determinants;
- to provide some tools for the analysis of differentials, trends and the determinants of health;
- and to provide a broader conceptual framework within which health issues can be studied and perhaps resolved.

To help us keep these goals in sight throughout the Workshop, we will be asking each participant to join a group which will focus on one aspect of health sector reform throughout. For one group, the issue might be the improvement of the maternity services; for others, this could involve increasing the effectiveness of the expanded program of immunization; or the required response by the health sector to a new disease such as AIDS, or changes in old diseases, such as tuberculosis or malaria.

Each group will be asked to produce a written report for presentation at the end of the Workshop. We want this report to contain some of the new analyses conducted during the Workshop as well as other materials which may be incorporated whilst in Boston. Many sections will be empty, since the data may be missing here or there may be a need for further studies and analyses which have yet to be completed. We are anxious to see the outline of the complete report, even though some sections will be missing.

The report should first present a problem or a goal. The problem might be an outcome variable, such as a high level of maternal mortality; a program goal such as the reduction of morbidity and mortality in a high-risk sub-population; or a policy reform such as the devolution of administrative and financial responsibility and public health to local communities.

The idea is that each team will first discuss the nature of the problem or issues, using materials from the Workshop. The next step would be to plan an approach to the study and the possible resolution of the problem. Along the way, there will be needs for analysis of data on population and health. Some of the analyses can be produced here using the Ghana DHS data we have on file. The results of these analyses will form part of the report. We would like the analysis to be written up as completely as possible, even though the rest of the report may be incomplete.

The final submission will consist of the following components:

Statement of problem or issue: detailed description of the proposed solution or actions and broad definition of the information needed.

Review of available information. Other studies. Past experience.

Scientific plan. Relationships which will be assumed or taken from other studies. Assumptions. New studies necessary to improve the proposed action.

Analysis of original data: the DHS files and other materials. Full description of the data employed, the difficulties in interpreting the data, the analytic approach adopted, and the results of the analysis.

How the analysis will affect action. Implications for the rest of the report. Need for further study.

Conclusions and recommendations, assuming other data are available.

Recommendations for future work.

There will be interim discussions of progress throughout the Workshop but on the last day, both oral and written presentations will take place.

oOo

Allan G. Hill  
30 July 1993



# **THE CONTRIBUTION OF THE PRIVATE SECTOR TO THE NATIONAL HEALTH STATUS IN GHANA**

## **EXECUTIVE SUMMARY**

**Prepared by:**  
**Ms. Muna Idris Al-Daoud**  
**Ms. Azra Hashmi**  
**Mr. Peter Thumbi**  
**Mr. Kokou Zotoglo**

**August 20, 1993**

### INTRODUCTION:

The population of Ghana was estimated to be 15.3 million in 1991. It has a high annual population rate of 3.2% per annum. If the population continues to grow at this rate, it will reach 20 million by the year 2000 and will double in less than 30 years, putting more pressure on the public health resources.

### HEALTH POLICY

Ghana is committed to the objective of attaining health for all by the year 2000 as spelt out in the ALMA-ATA declaration of 1978 and re-emphasized in the World Summit for Children in 1990.

The purpose of this paper is to attempt to investigate the contribution of private sector in health status of Ghana. Ideally, this objective may be achieved by looking at the contribution from the perspective of health financing and expenditures with a clear breakdown between private and public sectors. This approach however poses some conceptual difficulties.

### DEFINITION OF PRIVATE SECTOR

The private sector can be defined as a source of health care where the public pays, in cash or kind, to acquire actual or perceived health care.

As DHS data will be used to analyze the situation of the private health sector and given the limitations presented by the objective of the survey, private health sector utilization could only be derived from the following few categories in the DHS questionnaire:-

- 1)Private Doctor/ Clinic
- 2)Private Maternity
- 3)Pharmacy/Chemical seller
- 4)TBAs

## THE METHODOLOGY OF THE STUDY

In this study, only secondary data is used; the major sources being the Demographic and Health Survey and the World Development Report. To assess the current contribution of the private sector to the national health status in Ghana, frequency distributions of various variables in the DHS survey are explored, and cross tabulations provide a better insight on the socio-demographic profile of the population using the private health services.

## THE ANALYSIS

The problem has been simplified by looking at the following questions:

- 1- The proportion of the population using the private health services?
- 2- The social class of the people using the private health services?
- 3- The synchronization of the private health providers' practices with those of the national health programmes ORT, CDD, ARI...

### **Proportion of the population using private sector.**

A large proportion of women receive pre-natal care by trained nurses or doctors. Many women do not receive pre-natal care. However, birth attendants provide pre natal care to a small proportion of women. At the time of delivery, traditional birth attendants assist 28 per cent of the women. Since there is no distinction between private and public sectors given, if we arbitrarily take birth attendants to be private sector, it is clear that private sector plays a major role in delivery assistance.

The contribution of private doctors in the treatment of children with diarrhoea can clearly be seen. Most children are not given any treatment. Of those who are given treatment, the majority of them are treated in hospital/clinic. Private doctors treat 12.9 per cent of them.

In this case, the questionnaire clearly defines doctor to be a private doctor, but again there is no distinction between private/public hospitals in Ghana (assuming that there are such private institutions). This shows that a good number of patients are seen by the private doctors (12.9%).

### **The Characteristics of the population using the private health services:**

In attempting to answer the question on the characteristics of the population that use the services of the private health sector, the following indicators are considered; socio economic status and education.

For socio economic status, the following mix of three indicators is used; (has electricity, has radio, has refrigerator) to classify the population into 4 categories:

- 0 if they had none of these commodities.
- 1 if they had one of these commodities.

- if they had two of these commodities.
- 3 if they had three of these commodities.

A large percentage of children coming from households of poor economic status are taken to private doctors, however, care should be taken when interpreting these results as the choice of provider might be determined by the severity of the disease.

Regarding the education of the women who are going to the birth attendants for pre-natal and delivery care, 53% have no education, 45% have only primary, 2.5% secondary and none with higher education utilize the services of the traditional birth attendants.

### **The practices of the private sector health providers**

The practices of the private doctors seem to be synchronized with those of the public health sector in the treatment of diarrhoea. The traditional birth attendants have a lower performance, only 34.8% of the women visiting them for pre-natal care receive tetanus injections compared with 82% for women going to trained nurses and doctors.

Further Information Needed:

In order to have a clearer picture, additional information is needed in the following areas:

- 1- Size of the private health sector.
- 2- Demand for the private sector services.
- 3- Legislation & general policies.
- 4- Insurance schemes.

### **RECOMMENDATIONS**

- 1- Delineation of the private and public sector health providers in the DHS survey.
- 2- Inclusion of cost of services in the survey.
- 3- Periodical health financing and expenditure surveys.
- 4- Better legislative and taxation records to help assess private health expenditure.
- 5- Survey of demand for the private sector health services (KAP).
- 6- Study the possibility of introducing health insurance for clinical services (Subsidized for the poor).
- 7- Inclusion of private sector in national training programmes.

# **MATERNAL AND CHILD HEALTH IN URBAN AND RURAL GHANA DHS DATA ANALYSIS**

## **EXECUTIVE SUMMARY**

**Prepared by:**  
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**Ms. Joyce Vincent**

**August 20, 1993**

### **INTRODUCTION**

The population of Ghana is estimated to be approximately 12.3 million (1984) with a annual population growth rate of 3 percent, a CBR of 48 percent and a CDR of 17 per 1000. At the estimated rate of growth Ghana is set to double her population within 25 years. Approximately 27 percent of the population live in urban areas while 71 percent are rural dwellers.

### **STUDY PURPOSE**

The purpose of this study is to determine possible urban rural differences in the health status of mothers and children in Ghana by analyzing the DHS Survey.

### **METHODOLOGY**

Data from the Ghana's Demographic and Health Survey carried out in 1988 was analyzed according to urban and rural differences in relation to the following groups of variables:

- Socio-economic status
- Demographic & fertility patterns
- Child morbidity and mortality
- Child nutritional status
- Women's knowledge & practices towards Family Planning
- Coverage & utilization of child and woman health services

The data was analyzed by a team of 5 workshop participants using the SPSS-PC+ package. Based on the findings this report was written.

### **RESULTS**

#### **DEMOGRAPHIC SITUATION**

Ghana is at the starting stage of demographic transition. The life expectancy at birth is at least

55 years, i.e. relatively high for sub Sahara Africa. Its population has very high and uncontrolled fertility, and combined with relatively low mortality it produces a very fast population growth with doubling time less than 25 years. This may lead to an environmental crisis because the population does not show any awareness of family size. Only about 10 percent of the population use some method of contraception, and 10 percent use modern methods, i.e., about 1 percent for total population. About a half of the population know nothing about human reproduction. From this we may conclude that the unmet need for contraception in Ghana is not high, because of low level of expressed need.

#### INFANT/CHILD MORBIDITY

Because of the lack of adequate data on morbidity, only 5 disease categories were examined. Three of these five diseases namely malaria, ARI and diarrhoea are among the commonest causes of morbidity and mortality in this age group in subsaharan Africa (WHO 1983). The overall prevalence of these diseases range from 39% for malaria to 28% for ARI, 16% for diarrhoea, 1.2% for bilharziasis and 1.0% for guinea worm infestations. There are variations in the pattern of these diseases in the different age groups. The highest prevalence for diarrhoea occurs in the age group 12-23 months while that of malaria occurs in the age group 24-35 months and that of ARI in the 0-11 years. As would be expected, there are differences in the urban/rural distribution of four of these diseases (malaria, ARI, bilharziasis and guinea worm infestations) but only those of malaria and bilharziasis were statistically significant. There was no urban/rural difference for diarrhoea.

#### NUTRITION

The three indices of nutrition status, weight-for-height, height-for-age, and weight-for-age were the indicators analyzed. This was done in relation to urban and rural children, using the mother's literacy as the controlling variable.

In general, Ghanaian children are a little shorter and lighter than the standard reference population. At the age of three months each indicator is close to the median, but as the child gets older the situation changes. The index weight-for-height which indicated acute undernutrition shows that approximately 8 percent of children are below 2 Standard Deviations. The difference between urban and rural children as controlled by the mother's level of literacy is of no practical significance.

The height-for-age index which measures chronic undernutrition shows that approximately 30 percent of these children are below 2 Standard Deviations. Again the difference between urban and rural populations is of no practical significance. Weight-for-age does not distinguish between chronic and acute undernutrition. By this index, however, 30.1 percent of the children fall below 2 Standard Deviations of the reference population.

#### COVERAGE & UTILIZATION OF MCH SERVICES

Planning the family is not yet a widespread practice in Ghana, where only about 13% of women at reproductive age use either modern or traditional contraceptive methods. The urban/rural differentials do not appear significant. As a whole Periodic Abstinence was the method most reported as being used in the survey.

The coverage for prenatal care is quite satisfactory, even in the rural area where 84% of

mothers who had births in the last 5 years reported receiving prenatal care. Similarly, in urban areas 96% of mothers received care. The coverage for tetanus vaccine is about 20% higher in urban as compared to rural areas. The data does not provide information about the quality of care.

Few deliveries are assisted by doctors in urban (12%) as well as rural (6%) areas. In urban areas most of them are assisted by trained nurses/midwives (68%) in contrast with the situation in rural areas where 62% of deliveries are attended by TBA or relatives who are supposed to be untrained.

In rural areas only one third of children have Health Cards (HC) and for those the coverage of measles (77%) and BCG (88%) vaccines are in relative terms quite high. Considering the rural child population as a whole and not only those with HC, the coverage for such vaccines would drop 30% and 23% respectively. DPT and polio vaccine that require three doses have lower coverage, especially in rural areas that achieves only half of the children.

Urban children with diarrhoeal diseases have received more medical care than rural children, who have received more traditional medicines. The percentage of children that have received ORT is about 40% in urban and rural areas, which is quite high coverage.

The prevalence of cough & difficult breathing (C&DB) was similar (around 20%) in urban and rural areas, as well as the use of antibiotics in those cases. Medical consultations and use of syrups was, however, higher in the urban as compared to rural areas.

There is no significant differential in urban and rural settings in relation to prevalence of fever that is about 35%. The treatment received was also similar in both groups, although the urban children had a 30% increase in medical consultations. Less than 10% received antibiotics and one quarter were treated with antimalarials.

## COMMENTS AND RECOMMENDATIONS

1. Family Planning: The use of modern contraceptive methods should be promoted, considering the country's high fertility rates. Family planning promotion should focus on the country as a whole.

2. Prenatal care: The coverage of prenatal care is high in both urban and rural areas. However, it is suggested that an assessment of the quality of care being provided, be done in order to guarantee that prenatal care will have a significant impact on the health of the pregnant woman and the fetus.

3. Delivery care: It is recommended that TBAs be trained in rural areas, where 60% of the deliveries are assisted by them.

4. Immunization: Vaccine coverage, particularly DPT and polio, should be extended to the rural areas where the survey found low rates of immunization.

5. Diarrhea/Cough & Difficult Breathing/Fever: The child care provided for these three illnesses is similar in urban and rural areas and shows a satisfactory coverage.

6. Nutrition surveillance must be continuous for children from birth to at least thirty six months. Children should attend child welfare clinics at least three times per year during this period for nutrition surveillance.

7. Children below 2 standard deviations should be given nutritional supplementation of a high calorie food, and followed up closely.

# **DECENTRALIZATION - PREREQUISITE DATA FOR DECISION MAKING**

## **EXECUTIVE SUMMARY**

**Prepared by:**  
**Dr. Koffi Agbekou**  
**Dr. Sandra Brandao Luna**  
**Dr. Clifford Kamara**  
**Dr. Hussein Mursal**  
**Dr. Justin Ndoyo**

**August 20, 1993**

### **I. INTRODUCTION**

It is generally recognized and accepted that health care delivery systems are overcentralized in most developing countries: this is manifested in numerous ways, with human resources, facilities, equipment and drugs concentrated at the top of the health system pyramid.

It therefore comes as no surprise that the decentralization of government health care delivery systems is increasingly being regarded as one of the potentially most important forces for improving efficiency in the delivery of health care services. In an effort to contribute towards this debate, the objectives of this study were defined as follows:

1. To determine the degree of centralization, if any, of the administration of the health services in Ghana and its consequences on the effective delivery of services;
2. To analyze the relevant aspects of the Ghana DHS database that relate to centralization;
3. To identify weaknesses and strengths within the DHS data in identifying factors that determine the degree of centralization;
4. Highlight the critical role of management and policy issues in decision making in the process of decentralization;
5. Recommend ways of obtaining the additional data required, as well as the implementation of the steps needed to facilitate the process of decentralization per se.

### **II. METHODOLOGY**

The Ghana DHS database served as the main source of data for this investigation. Variables that relate to the objectives of the study were chosen and analyzed, with indicators being computed by area of residence as follows:



- Card availability
- Measles coverage
- Polio III coverage
- Source of drinking water
- Use of toilet facilities
- Prenatal care current pregnancy
- Tetanus toxoid coverage current pregnancy
- Assistance at delivery
- Knowledge of any method of contraception
- Ever usage of any method of contraception

It is recognized that the objectives of the Ghana DHS may not have been directly related to the study of the issues pertaining to centralization of the health care delivery system. Therefore in view of the limitations in the available data as regards the objectives of the survey, additional data was sought in the literature to augment that obtained from the Ghana DHS database. This was mostly data regarding the funding (budget, including sources and allocations by area) and administration (e.g. organigramme indicating staffing patterns and lines of authority and responsibility, distribution of health facilities) of the health system.

### III. RESULTS

The results indicate that the health services being delivered in the urban areas are markedly better off than those in the rural - both in terms of clinical medicine as well as public health activities. Almost all of the indicators computed from the Ghana DHS database suggested this, further supported by tests of the difference that were highly significant with p-values <0.001 in most cases. The findings of the literature review were also very supportive of this, indicating a marked maldistribution of funds, human and other resources in favor of the urban areas.

### IV. DISCUSSIONS

Basing our arguments on the above-mentioned findings, it is being suggested that the marked urban-rural disparities in the health care delivery system as in the health status of the population can be attributed, mostly, to overcentralization of the administration of the health services. The weakness of the argument is the fact that this situation can also be attributed to numerous other factors and conditions that have neither been studied nor controlled for, making such a conclusion extremely difficult to prove., The only "justification" put forward here is the fact that the limited time available for the conduction of this study, coupled with the almost total lack of the needed information, would have made the more detailed study necessary virtually impossible.

### V. RECOMMENDATIONS

In view of the weaknesses of the described health system, it is recommended that immediate steps be taken to decentralize as follows:

Production of a plan of the activities to be conducted to implement decentralization that will include, but not be restricted to, the following steps:

- Conduction of studies to obtain the additional data and justification for decentralization: this will entail the conduction of surveys similar to the DHS, but revised to ensure the collection of data relevant to the administration and management of the health care delivery system;

- Advocacy for political commitment and will to decentralize;

- Raising the awareness of health workers at all levels of the health care delivery system about the need for this change, and soliciting their support and cooperation in implementing it;

- Decentralization of the funding and accounting mechanisms within government generally, and in the Ministry of Health in particular;

- Capacity building, including the training of staff, to ensure that the proposed changes can be implemented in a cost-effective, sustainable manner.

# HEALTH INEQUALITIES IN GHANA

## EXECUTIVE SUMMARY

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### INTRODUCTION

Quantitative and qualitative assessment of inequalities might influence health policies, as well as intersectoral development strategies. We have made an attempt to perform such analysis for Ghana, paying specific attention to the role played by the health sector.

The objectives of this study are:

- (2.1) To explore the inequalities in health status indicators
- (2.2) To explore the inequalities in health service delivery
- (2.3) To find out the extent to which inequalities in service delivery contribute to the overall health status of children under the age of five in Ghana
- (2.4) To identify areas which need further research

### METHODS

The Ghana Demographic and Health Survey is reviewed for measuring the health status of the different sectors of the population, the following index was selected:

- \* Under 5 Mortality Rate

The above index was cross-tabulated against the following socio-economic (independent) variables to quantify the differences in the health status of the different sectors of the population:

- \* Women's education (V106)
- \* Region (V101)
- \* Husband's education (V701)
- \* Type of place of residence (V102)
- \* Source of drinking water (V113)
- \* Type of toilet facility (V116)
- \* House characteristics (V119), (V127), & (V128)

To explore the role of the health sector the following variables showing utilization of health

services were examined:

- \* Received trained prenatal care (PRENAT)
- \* Received trained care at birth (DELCAR)

## RESULTS & CONCLUSIONS

Although the amount of analysis carried out so far on the available data has been limited, we believe that some provisional conclusion can be attempted. We will present them briefly, following the order of the stated objectives of our research.

### Objective 2.1 "To explore the inequalities in health status indicators"

The results show that the probability of dying between ages 1 and 5 is higher in children born from mothers with lower educational level, from fathers with lower educational level, from households with no floor, no toilet and no source of drinking water, and from rural rather than urban areas. The differentials are significant, particularly as far as the educational levels are concerned - the relative risk of death being almost doubled for children from uneducated others with respect to children from mothers with secondary education - quite stable for the various age groups and with a consistent internal trend (for example, the highest probability of dying is for children from uneducated mothers and the lowest for children from the mothers with the highest educational level).

### Objective 2.2 "To explore the inequalities in health service delivery"

Only prenatal care and care at delivery were considered. Overall, 82% of women received prenatal care and 60% received trained delivery care. However, only 70% of uneducated women received prenatal care and only 29% of women from rural areas received delivery care, showing that the health care delivery is far from being evenly distributed.

### Objective 2.3 "To find out the extent to which inequalities in health service delivery contribute to the overall health status of children"

The analysis of the relationship between prenatal and delivery care and the proportion of children died between 1 and 5 years show that the latter is quite higher for women who did not receive prenatal care (RR being 1.37 with respect to the average and 1.5 with respect to women who did receive prenatal care). On the contrary, trained care at delivery does not seem to produce significant differences. This apparently unexpected finding is likely to be due to the fact that a high proportion of pregnant women going through prenatal care and not being considered as being at high risk deliver at home. a case control study of negative perinatal outcomes, looking for prenatal care would probably allow us to support this hypothesis.

Finally, the results allow us to determine the relative importance of mothers education and prenatal care as determinants for the health status of children. They seem to act synergically, since prenatal care produces better outcomes among women with the same educational level, including the group with no education.

The provisional conclusions are therefore the following:

- Social, cultural and geographical inequalities are present in Ghana and do determine significant differentials, at least in the health status of women, appear strong determinants of child health status.
- The health services, with special reference for prenatal and delivery care, are not evenly distributed and therefore contribute to inequality, since it is apparent from our data that health care does make a difference in health outcomes.

#### Objective 2.4 "Areas which need further research"

Available data from the DHS seem sufficient to explore inequalities related to the health status of young children, including a tentative evaluation of the role played by the health sector itself. Also differentials in knowledge and use of family planning can be thoroughly examined, and should be specifically addressed by a further analysis of the DHS data.

Maternal mortality and morbidity, and prevalence of low birth weight do represent, in our opinion, important indicators that DHS is not able to determine, due to DHS design and methodology. We believe that an effort should be made to integrate DHS data with data from other sources in order to provide useful information concerning these three indicators, therefore providing a more complete view of the health of women and children in Ghana, and making possible an analysis of the differentials.

We also suggest that anthropometry should be included in the next version of the DHS for women of child bearing age.

Finally, DHS does not allow to explore, with the remarkable exception of Family Planning, the knowledge, attitudes and belief, and the economic constraints, possibly related to the use or non use or less effective use of the health facilities, especially by the less educated. No information is provided about the quality of the services. This additional information is important in order to identify appropriate policies both for the health sector (different regional allocation of resources, training of personnel, health education programs) and for the intersectoral development interventions (transports, education, especially for young women, etc.).

## RECOMMENDATIONS

There is a need for extending all the essential health care services to the women with little or no education. In addition to disseminate information about positive health behavior we need to inform them about the health care services available as well as where these can be found. In addition, the Ministry should undertake a feasibility study into the establishment of outreach programs aimed at high-risk groups in the various communities. We recommend that the following services be made available free of charge to all sectors of the population of Ghana

- Prenatal care for women
- Trained care at delivery
- Full immunization for all children under the age of 5 years
- Nutritional support for all women of child bearing age and all the children under five years of age
- Treatment for all the sexually transmitted diseases
- Counselling, testing and treatment for all AIDS-related problems
- Treatment for tuberculosis
- Treatment for all the endemic parasitic conditions

We recommend that with findings of this report serving as a baseline, the ministry should institute a surveillance program aimed at monitoring the impact of the measures recommended above.

Since the level of education of both parents of the children had a significant bearing on the risk of dying for the under-5 children, we recommend that the Ministry of health should approach the Ministry of Education with a recommendation for the improvement of the level of education and literacy among all the sectors of the population, especially the women.

## APPENDIX VII - WORKSHOP EVALUATION

The participants were asked to complete an evaluation form at the end of the workshop to rate the quality of the program. The questionnaire was designed to collect feedback for the speakers and organizers of the workshop as well as to USAID.

Overall, the participants agreed that the workshop was excellent and 78% felt that it would help them in their job. They gave high marks for the range of topics covered and for the depth in which they were handled. One participant stated, "I particularly appreciated the broad range of issues which were combined during the workshop." The participants enjoyed the link between classroom and computer laboratory; "I find the workshop extremely useful for me! SPSS classes (were) great..."

Some of the participants' suggestions for the future were: follow-up by sending out literature and information to the participants; technical support from Harvard for participants' country projects; and organization of more DHS workshops.

For more detailed information regarding the workshop evaluation, please see attached the "Evaluation Summary".