Chapter 3

Analytical Work of the Global Forum for Priority Setting

Section 1:
Burden of disease and health determinants

Section 2:
Measuring the 10/90 Disequilibrium

Section 3:
Relevant and appropriate use of resources: cost-effectiveness analysis

Summary

This chapter focuses on the three instruments supported by the Global Forum for Health Research to improve the priority setting process:

Analysis of the burden of disease

Over the past decade, major progress has been made in the calculation of the burden of disease, particularly through the Global Burden of Disease Study (GBD 1990). Plans for the continuation of this work were presented at Forum 2 in June 1998. The continuation of this work is entitled GBD 2000, with projections of the estimated disease burden to the year 2030. This work at the global level needs to be complemented by disease burden studies at national levels. A number of such studies are under way.

Monitoring resource flows in health research

At present, there is no systematic monitoring of global investments in health research. The most recent estimates of resource flows in health research date back to 1992. Yet this information is crucial if the allocation of resources is to be improved both at the global and national levels. In response, the Global Forum for Health Research and other partners have launched an international working group for the development of a systematic approach for monitoring resource flows. In parallel, a number of studies on resource flows at national levels have been supported by COHRED.

Cost-effectiveness analysis of investments in health research

Cost-effectiveness analysis helps identify which research projects are likely to produce the greatest improvements in health status for the available resources and therefore plays a crucial role in the priority setting process. The Global Forum for Health Research is supporting a number of cost-effectiveness studies in developing countries. The objectives are two-fold: first, to help develop a standard methodology in this field for broad application to interventions in the developing world; and second, to evaluate interventions against some of the major diseases. This has led to the evaluation of interventions against malaria in Africa and to the launch of seven other studies.

Introduction

Interventions by governments and health agencies to improve the health of people are determined by health policies at the global and national level. Although the development of these health policies is inevitably influenced by political considerations, there has been an increasing effort to ensure that health policies and priority setting are more evidence-based and less dependent on the arbitrary views of individual policy-makers.

The analysis of evidence is a critical task at all levels of development. Good information is needed for sound decision-making and the cost of obtaining that information has to be weighed against its use. The search for evidence must be focussed on those areas directly relevant to health policy development and priority setting. The impact of diseases on populations, the effects and costs of interventions, the role of health determinants, and the resources used in the collection of such evidence are critical elements of this research.

The Global Forum for Health Research promotes and supports analytic work in a number of these areas. Priority is given to those areas of health R&D that are central to improving the health of the large majority of the world's population. Through collaboration, partnerships, and co-sponsoring, new information can be generated, evaluated, promoted, and used for decisions that affect the allocation of resources for health research.

In addition to its work on some specific priority health conditions, the Global Forum has focussed on the following key analytic issues, which originate from the recommendations of the WHO Ad Hoc Committee:

- burden of disease and analysis of health determinants
- monitoring resource flows and priorities for health R&D
- cost-effectiveness analysis and methods to assist resource allocation.

Progress has been made in each of these fields and the Global Forum has been a catalyst and co-sponsor of this analytic work – facilitating the dissemination of results to a wider audience and generating interest and support from a wider range of constituencies.

Section 1:

Burden of disease and health determinants

1. Global burden of disease

The concept of the global burden of disease should be viewed as complementary to national burden of disease studies. At the global level, major work has been undertaken by the WHO Ad Hoc Committee and the Harvard University/WHO/World Bank Burden of Disease 1990 (GBD 1990) study. The GBD 1990 arose from the Health Sector Priorities Review of the World Bank over the last decade and was first presented in the World Bank's *World Development Report 1993*. The data has since been re-analysed and produced a wealth of information on a wide range of health conditions for different regions of the world.

An important focus of this work has been an emphasis on standardization of methods for data collection and analysis. The model for data collection has a significant influence on the type and quality of information collected, and the model presented by this work allows for varying degrees of precision, depending on the requirements. One of the objectives was to achieve consistency in global estimates from a wide spectrum of sources and ensure avoidance of double counting in data, especially for mortality estimates.

Another important aspect of GBD 1990 has been the investigation of the determinants of health. Estimates have been made of the contribution of smoking, alcohol, substance abuse, and other lifestyle factors to global ill-health. However, the burden of risk factors for diseases and other causes of ill-health need further exploration.

Over the past decade, the global burden of disease work has had a powerful influence on policy-makers and proved to be an effective tool for advocacy. The work has informed a large number of national and global initiatives and the accounting of healthy life lost as a consequence of morbidity has led to a renewed interest in a wide spectrum of conditions.

Disease burden estimates need to be updated periodically to take into account the changing demographic and health profiles of different countries and regions. Plans for such a Global Burden of Disease exercise for the year 2000 (GBD 2000) were presented at Forum 2 (Insert 3.1).

Insert 3.1
Goals for the Global Burden of Disease 2000 Project

- Inform debates on global and regional health priorities through the timely provision of information on the magnitude of health problems and risks.
- Provide the technical and scientific foundation and guidance for national burden of disease analysis.
- Provide the rubric to organize, maintain, and eventually institutionalize burden of disease analysis.
- Incorporate new information on mortality, causes of death, and non-fatal health outcomes for global and regional assessments of burden.
- Develop and disseminate new methods for burden of disease analysis.
- Provide standardized epidemiological background for sectoral cost-effectiveness analysis.

Specific Objectives of the Global Burden of Disease 2000 Project

- Estimate population and deaths in 1990 and 2000 by sex, region, and age.
- Estimate mortality for over 100 diseases and injuries by sex, region, and age.
- Estimate internally consistent incidence, prevalence, duration, and case-fatality for the major sequelae of each disease and injury by age.
- Measure health state preferences by region for sequelae including gender, age, and socioeconomic status.
- Use the information to calculate various composite measures of health outcome, DALYs and DALE (disability adjusted life expectancy).
- Develop and measure inequalities of burden with specific application in 16 countries (two per region).
- Estimate attributable and avoidable burden for major distal, proximal, and physiological determinants of premature mortality and non-fatal health outcomes.
- Project alternative probable scenarios and select possible scenarios with significant policy implications – mortality and non-fatal health outcomes by cause, age, sex, and region to the year 2030.
- Strengthen the capacity of developing countries to undertake burden of disease analysis and provide technical leadership for BOD.
- Develop methods to estimate the incidence and prevalence of major co-morbidities and for the assessment of health state preferences of these co-morbidities.

(Source: C. J. L.Murray. Presentation at the Second Annual Meeting of the Global Forum for Health Research,June 1998)

The aim of the project is to provide timely, objective information on the magnitude of global health problems and risks. An attempt will be made to measure the complete range of fatal and non-fatal health problems as well as a range (distal, proximal, physiological) of risk factors. Efforts are currently under way to secure funds and to develop a network of

scientists from developed and developing countries to collaborate on the project. The Global Forum is a partner in the development of the project.

2. Developments at the national level

Efforts to obtain better data on the health profile of populations is continuing in all regions of the world. These efforts use a variety of strategies to collect information on the burden of disease and health determinants for local or national populations. The development of sentinel sites, use of national surveys and country-based burden of disease studies are among the main methods used. The range of diseases and conditions included varies according to the particular health problems of different areas. These efforts have a major impact through enriching both the databank of health information and the methodologies that can be used to measure the impact of ill-health on people.

Sentinel sites

The development of sentinel sites within countries, which are monitored and surveyed for demographic, epidemiological, and health data, is critical to a rapid assessment of health status and response in the developing world. These sites can play an important role in the development of systems and methods for monitoring health. The sentinel sites also provide fertile ground for community development, as well as opportunities for education, training, and community-based investigations (such as why some households in a population are at higher risk of disease than others).

An international network of these sites forms a collaborative mechanism for data and experience sharing. An example of this is the INDEPTH network in the developing world where vital data is being collected prospectively.[1] The sites have a standardized methodology for data collection, especially on core health indicators. Local capacity is being developed to strengthen sites and improve the quality and type of data. Meanwhile, an effective platform has been created for the sharing of both information and expertise between countries – demonstrating the achievements that are possible even in resource-poor settings as a result of good direction and focused funding.

The network has 43 potential sites, including 28 in Africa. Linkages between these sites will enable them to pursue shared objectives, including to:

- be visible and become recognized as a critical member of the network
- continue to improve methods and technologies for resource-poor settings
- define a dynamic research agenda
- cultivate cross-national activities
- build institutional and individual capacity
- strengthen the research-policy interface
- improve the validity and general applicability of information for different regions.

The INDEPTH network hopes to achieve these opportunities through effective use of the following strategies:

- fostering connections between the sites collectively and regionally, and to the outside world through the use of technology and communication strategies
- reinforcing the methodologies through substantive research, technical exchange, and workshops
- strengthening the capacity of these field sites through training and partnerships
- gathering information through effective local and national partnerships and com-

[1] *Binka F., Bridging the Gap: Bringing Reliable Health Information to bear on Policy Formulation in Developing Countries. Presented at the Second Annual meeting of the Global Forum for Health Research, 25-26 June 1998, Geneva.*

munication systems for use in the development of policies.

National Surveys

Although the use of nationally representative health interviews and examination surveys is well established, the use of such information for national and local decision-making has been relatively weak due to factors such as lack of political will, shortage of timely data, and the traditional gap between researchers and policy-makers. However, this situation is improving, as exemplified by work jointly funded and carried out by North-South partnerships in Africa and Asia. The Tanzanian Adult Morbidity and Mortality Project (AMMP) is an example of information that has influenced health policy and intervention development in that country.[2] This bilateral development assistance project (Tanzania and the United Kingdom) undertook prospective monitoring of three districts in 1992 to document the magnitude and causes of mortality, describe health determinants, and estimate the socio-economic impact of diseases on the population. This information has been supplied to policy-makers and used in the policy-making process – a move which distinguishes AMMP from similar projects elsewhere in Africa.

Within five years of its launch, AMMP results have been used by both the public and NGO sectors at the national and district levels (Insert 3.2). The data have been used to develop a national strategy on tobacco legislation, and by district health management teams for health planning and intervention development. This work has afforded vital insights into the health of the Tanzanian people, including information on intra-country diversity in health status and access to health services. The use of information from such field sites is an example of optimal utilization of health R&D in the developing world.

Insert 3.2

Uses of AMMP Data in Tanzania August 1997 - January 1998

Level	AMMP Data Used	Policy/Planning Document
National		
Dir. Preventive Services, MoH	Smoking behaviour in AMMP areas.	Cabinet briefing paper on proposed tobacco legislation.
District		
District Health Management Team, Morogoro Rural District	• population; • household size; • death rates and major causes of death; • prevalence of NCDs; • prevalence of hepatitis B markers; • burden of disease as measured in Years of Life Lost (YLLs).	1997/98 District Health Plan: • baseline demographics; • burden of diseases; • priority lists of diseases and health problems for intervention; • health education priority areas; • "problem trees" for maternal and under-5 mortality; • health needs priorities.

[2] *Kitange H., The Burden of Disease in Tanzania: Policy Implications of the Adult Morbidity and Mortality Survey. Presented at the Second Annual meeting of the Global Forum for Health Research, 25-26 June 1998, Geneva.*

Insert 3.2 *(continued)*
Uses of AMMP Data in Tanzania August 1997 - January 1998

District Health Management Team, Temeke (Dar es Salaam)	• population; • household size; • death rates and major causes of death; • health facility use before death.	• Minimum Package of Health Services to be offered at all levels of the health service; • priority interventions; • priorities for health education; • training for health workers on quality of care; • community IEC on health service use.
NGOs & Health Projects		
Population Services International	• YLLs lost to malaria in Dar es Salaam and Morogoro Rural District (all ages).	• design of social marketing of insecticide-treated bednets for malaria control; evaluation of project impact.
WHO and Ifakara Health Research and Development Centre	• YLLs lost to malaria among children in Morogoro Rural District.	• design of trial for use of artesunate suppositories in treating malaria in children during referral.
ELCT Northern Diocese Primary Health Care Programme	• Information on risk of death due to noncommunicable diseases.	• public health education and health promotion programme.

(Source: Adult Morbidity and Mortality Project (AMMP), Tanzania)

The National Health Survey of Pakistan is another example of both effective North-South partnerships and use of health information for policy development.[3] This health interview and examination survey was conducted jointly by the Pakistan Medical Research Council and the National Center for Health Statistics/US Centers for Disease Control and Prevention (NCHS/CDC).

Nigeria is another example of a developing country where an important national survey on health has been conducted. As a result of the information on noncommunicable diseases gathered in this exercise, national guidelines for the management of hypertension have been developed. This timely conversion of survey results into policy is a positive development.[4]

National burden of disease

Over the past five years, national burden of disease studies have been carried out in Latin America, Africa, North America, Europe, and Asia – demonstrating a resolve to pursue such evidence. These efforts are also important for the development of national capacity in this area and help focus attention on the need for more and better quality data for decision-making in health.

A burden of disease study recently completed in the United States has revealed significant variations between the 50 States.[5] Life

[3] *The National Health Survey of Pakistan: Summary, Pakistan Medical Research Council. Distributed at the Second Annual Meeting of the Global Forum for Health Research, 25-26 June 1998, Geneva.*

[4] *Akinkugbe O.O., The Nigerian Non-Communicable Disease (NCD) Programme. Presented at the Second Annual Meeting of the Global Forum for Health Research, 25-26 June 1998, Geneva.*

[5] *Murray C. J. L., Global Burden of Disease 2000. Presented at the Second Annual Meeting of the Global Forum for Health Research, 25-26 June 1998, Geneva.*

expectancy in different States varied by as much as 40 years. The study shows that within the United States, life expectancies range from those equivalent to South Asia to those that are greater than the life expectancy for females in Japan. Such findings are not only important as documentation of a health status differential, but also as an indication of the variation in access to and delivery of health care. The reasons behind this inequity are central to health policy development.

3. Burden of disease methods

The methods for burden of disease assessment and evaluation of health determinants will improve over time as their use increases. These methods need to be validated in different environments and social settings – establishing another common area for global and national collaboration. In addition, the individual technical steps involved in these complex methods need to be assessed at national and local levels. Meanwhile, the impact of technical choices on health-related decisions should be made explicit, so that countries can have an informed debate about their health priorities.

Health data needs to be analysed and presented at a disaggregated level. A breakdown for important variables should be attempted to enable assessment of the burden on each segment of the population, defined by categories such as gender or poverty. The possible range of health states needs to be made explicit and the search for the effect of interventions on these groups should be part of the research design. District and geographical comparisons, time trends in data, and other aspects of health information and burden of disease assessment will help in exploring potential approaches to reducing the inequality in disease burden between different groups.

Burden of disease results are a product of data, methods, and analysis. Each of these components has elements that can be strengthened over time with more experience. The lack of reliable and valid data either at the country or disease-specific level is a central concern for all types of analysis. Statistical correction methods can only adjust some errors and to a finite degree, and such limitations need to be recognized. Methods that are compatible for easy and timely use by countries need to be promoted so that they are used to assist decision-making, not only to fulfil a research need. Explicit use of epidemiological methods, value choices, assumptions, and borrowed estimates will increase the transparency of the analysis. This will further enhance the use of such results by policy-makers and help encourage the translation of essential research into health policy.

4. Agenda for the future

Over the past decade, there has been remarkable progress in global knowledge of the burden of disease and health determinants. However, the lack of information from a large part of the globe is still a problem. Efforts are needed to improve this and fill in the information gaps, especially where they are important for global, national, and regional decision-making.

Mortality

Increased efforts are needed to strengthen national vital registration systems in the developing world. The use of sentinel sites is one way of creating a rapid mechanism to obtain data. There is a need to create and strengthen additional strategies that are developed and sustained locally.

Cause of death reporting is either nonexistent or unreliable, with a high proportion of deaths classified as ill-defined. Those unrecorded or not defined are more likely to be among the poor with little access to health care. Health information systems should address this critical need for better mortality descriptions.

Morbidity
There is an urgent need for better data collection on the morbidity profile of populations.

Methods
Countries should make use of burden of disease methods. There is also a need to develop simplified tools for use by national and sub-national decision-makers. These will enable the incorporation of local and national criteria and values, in addition to the global ones, for use by these countries. Meanwhile additional work is required to enable measurement of changes in health status, especially in relation to specific interventions.

Capacity
Improving the human and institutional capacity in developing countries to collect, analyse, and act upon health information is crucial. However, the creation of a better evidence base for decision-making in the health care and health R&D sectors will depend upon the availability of human and technological resources within these countries.

Search for inequities
The use of disaggregated data is of critical importance in the search for and description of health inequities. This data can be used to support demands for more equity in global health care. Meanwhile, information on health inequities should be backed up by an analysis of the interventions required to reduce these inequities. Future work in this area will involve the identification of programmes and strategies to reduce inequities.

5. Conclusion

Any research agenda at the global or national level is an investment. In the face of scarce resources, the very act of research needs to be justified. Therefore, efforts should be directed to using research to generate data that helps policy-makers make better informed and more rational decisions on resource allocation.

It is also important to understand that the extent and speed with which data-based health policies are developed is influenced by the way health systems function and by legislative and regulatory aspects of decision-making. Since there is diversity between different types of health systems, this variation should be studied carefully to ensure the optimal development and implementation of policies.

Section 2:

Measuring the 10/90 Disequilibrium

1. Monitoring resource flows for global health research

At present, there is no systematic monitoring of global spending on health research. As a result, there are no accurate estimates of global spending, nor of the amounts allocated for research on the main diseases or risk factors. Yet this information is vital if the allocation of resources is to be improved at the global and national levels.

Although no regular monitoring system exists, independent estimates of resource flows have been attempted. The Commission on Health Research for Development (1990) estimated that 95% of health R&D resources are spent on problems affecting people in the industrialized world, while only 5% are spent on health problems in developing countries (Insert 3.3).

Insert 3.3
Global Resources for Health R&D: The Facts

Estimates for 1986	*(Commission on Health Research for Development)*	
•	Global investment in health research:	US$ 30 billion
•	Investment for problems of developing world:	US$ 1.6 billion
Estimates for 1992	*(Harvard University)*	
•	Global investment in for health research:	US$ 56 billion
•	Investment for problems of developing world:	US$ 2 billion

Additional estimates for 1992 and 1995 by researchers at Harvard University identified a similar range of imbalance in which only 5%-10% of global spending on health R&D was being spent on health issues that affected the large majority of the world's population. These figures are referred to as the 10/90 Gap.

2. Components for monitoring global resource flows

The development of a systematic mechanism for monitoring resource flows is one of the analytic work components of the Global Forum.[6] A core group of partners, including members of the governmental, non-governmental, multilateral, bilateral, and academic sectors are collaborating in the development of such a system (Insert 3.4). Meetings hosted by WHO and the Global Forum for Health Research were held in March 1998 and January 1999. The major components of the system include an international database on research funds and an international database on research projects.

Insert 3.4

Global Forum for Health Research
Monitoring Resource Flows for Global Health Research and Development

Core group membership

- COHRED - Council on Health Research for Development
- Global Forum for Health Research
- Government of Thailand
- Government of Malaysia
- Harvard School of Public Health, Harvard University, USA
- Health Authority of New Zealand
- National Institutes of Health, USA
- Pan American Health Organization (PAHO)
- Government of the Philippines
- Sida/SAREC - Swedish International Development Cooperation Agency
- SHARED - Scientists for Health and Research for Development, Holland
- Wellcome Trust, United Kingdom
- World Health Organization (WHO)
- United States Agency for International Development (USAID)

[6] *Michaud C., Systematic Mechanisms for Monitoring of Resource Flows. Presented at the Second Annual Meeting of the Global Forum for Health Research, 25-26 June 1998, Geneva.*

International database of health R&D funds
The creation of a database to track funding is part of the effort to monitor global resource flows. It will be based on information supplied by all major funding agencies on their allocation of funds for global health R&D. The database will begin with information from reporting systems currently used by these agencies and work towards converting that information into a common format. Thus, allocations from each funding agency will be used to extract relevant information and will be fed into the database. The agencies themselves may eventually adopt this kind of "conversion" system – allowing data to be fed directly into the database. This compendium of information would then form the basis for monitoring resource flows over time. Sharing over the Internet and further analysis of this information will allow for an iterative process and gradual improvement of the database.

International database of health R&D projects
For the establishment of an international inventory of health R&D projects, the following issues need to be considered:

- coverage of the database
- maintenance and control of the database
- checks and quality control
- protection and privacy issues.

The US National Institutes of Health (NIH)[7] has experience in the development of this kind of database for NIH-funded projects. The Computer Retrieval of Information on Scientific Projects (CRISP) has been a gopher-based system and is being adapted by NIH for the World Wide Web. Meanwhile, Scientists for Health and Research for Development (SHARED) is a similar new initiative, developed in Holland to facilitate the global exchange of information among researchers. It has been set up on the World Wide Web by a group of European and developing country scientists and funded by European sources. It lists the R&D projects by categories and provides detailed contact information at the individual level. The possibility of linking a US-based system (CRISP) with the SHARED system might combine the benefits of both, with the added value of providing additional financial information for the new system.

Accessibility of developing countries
Researchers, agencies, and other organizations based in the developing world often have difficulty in accessing information. There is a need to ensure that scientists in developing countries are able to:

- access the Internet both promptly and at low cost
- find data pertaining to resource flows in health R&D
- obtain information on health R&D
- obtain information on funding opportunities for health R&D.

These in turn relate to the availability of technology, the cost of acquiring and using it, and, to some extent, to the development of an information technology infrastructure in these countries. Although efforts are being made to grapple with some of these issues, there is no concerted initiative to address these needs in relation to health R&D. In the United States, for example, the University of Texas has developed STARLINE, an information data-base on funding, for use on the Internet. This can provide online information on potential sources of funding for researchers and partners in the developing world.

[7] *Baldwin W., Points for Consideration for Developing a Scientific Database. Presented at the Second Annual meeting of the Global Forum for Health Research, 25-26 June 1998, Geneva.*

3. The challenges

The monitoring of resource flows for global health R&D faces a number of challenges:

- Since there is currently no system or institution that monitors global resource flows, information available from different sources is fragmented and varies widely in both quantity and quality.
- Information relating to public health sector investments in health R&D is not readily available and estimates have to be based on additional country-specific or regional analysis.
- The information available on resource flows is not based on standardized classification systems or definitions.
- There is no common or accepted analytic framework for resource flows in health R&D.

The international working group (Insert 3.4) is currently discussing strategies to deal with these challenges, especially the development and maintenance of an "international database", which could include the following:[8]

Decentralized approach

Each country or entity would be responsible for establishing and maintaining its own system which could be accessed via a centralized global system. This would provide individual control over the quality and timeliness of information that is fed into the database. This would also avoid the creation of an additional database and a separate process for submission of data to a central system, bringing some cost savings. However, it would not provide for central assessment of quality and would be delayed in many countries by the lack of funds to develop such a system.

Centralized system

Each country or entity would submit information to a central system. In this way, quality assurance would be consistent and delays in establishing individual systems would be avoided. Economies of scale could be achieved through the inclusion of a large number of participants and through putting the creation of such a system out to competitive tender. However, a separate, centralized organization and management structure would be needed, thereby incurring additional costs. The system would also require continuous maintenance and uploading of information from different sites.

A hybrid or combined system

This would be based on features from both the centralized and decentralized approaches. It could be a web-based system with a virtual database with links to every site. Such a mixed approach would provide the opportunity for central quality control, avoid the creation of individual systems (thereby reducing costs), avoid separate systems for data entry and retrieval, provide the opportunity to integrate existing data sets, and have a common interface for all users. However, the cost savings from economies of scale that may be realized with a central system may not apply in this case.

Other issues currently being addressed by the core group (and other partners) include the following:

- Provide a clear understanding of institutional mechanisms currently in place to monitor health R&D investments from major funders/donors.
- Agree on a set of standardized inputs and methods for the creation of a data set at the aggregate and disaggregate levels. The core group has started deliberations on this

[8] *From Baldwin W. (see above).*

issue, beginning with a review of definitions used in this area.

- Initiate selected country-based studies, especially in the developing world, with partners (such as COHRED) to document the flow of resources and define methods for governments to monitor such flows. Country-based studies have been initiated in Africa (South Africa), Latin America, and South-East Asia (Philippines, Thailand), while other country-based experiences have been exchanged within the core group (Inserts 3.5 and 3.6).
- Explore strategies for incorporating data from different institutions in the developed world (such as those in the OECD countries). The core group discussed this at length and a common sharing of ideas is under way for the development of an analytic framework.

Insert 3.5
Resource Flows for Health R&D: A Study of the Philippine Experience

Objectives

- To trace the flow of health R&D resources in the Philippines, by looking at funding sources, as well as the nature and composition of health R&D expenditures.
- To assess and document a system for setting health R&D priorities.
- To determine if health R&D funds match the priorities of the national research agenda.
- To compare health R&D data and establish trends over time using survey results from the Department of Science and Technology.
- To conduct inter-country comparisons on the amount and nature of expenditures for health R&D.

Methodology

Definition of health R&D:

- For purposes of this project, a modified version of the United Nations Educational, Scientific, and Cultural Organization (UNESCO) definition of R&D was used.

Data collection:

- The accounting framework was used to track the flow of funds for health R&D from funding sources to fund users, the latter referring mainly to funding recipients tasked to undertake the R&D activity.
- Primary data were generated with the use of a structured questionnaire that requested information on the flow of resources for health R&D in 1996. Institutions identified in the framework as funding sources and users were surveyed. Responses were subsequently supplemented with personal interviews.

Sample:

Government sector departments	Private sector	Funding agencies
• Health	• Top 100 pharmaceutical companies	• Bilateral
• Science	• Academic/research centres	• Multilateral
• Education, culture and sports	• Hospitals	
• Academic/research centres	• Others (clinics, etc.)	
• Hospitals		
• Others		

Insert 3.5 *(continued)*

Results

Government of the Philippines

- An estimated US$ 72.13 million of resources allocated for R&D activities.
- US$ 12.05 million or 16.7 % was devoted to health R&D.
- Health R&D accounted for 0.57 % of health resources overall. (WHO-prescribed standard: at least 2 % of national health expenditures should be devoted to health R&D).
- Health R&D expenditures appear to be concentrated in three departments, with the Department of Health accounting for the largest share at US$ 8.83 million (73 % of total health R&D resources).

Methodological and other issues

- Inconsistency of definitions across respondents
- Estimation errors in measuring R&D resources
- Absence of a system for monitoring health R&D
- Absence of an effective validating mechanism that can flag under-reporting, over-reporting, and double counting
- The time lag between health R&D priority pronouncements and implementation.

(Source: Alano B.,1998)

Insert 3.6
Philippines Government Budget for Health and for Health R&D

	Millions of US$	Percent of Total
Total Government Budget	11 282	100.0
Expenditures for Health	2 129	18.9
Expenditures for Health R&D	12	0.1

4. Systematic monitoring of global investments in health research and development

The activities outlined above will form the basis for the development of a workplan for the core group. This workplan will define the key features of an institutional mechanism for the systematic monitoring of global investments in health research and development. The overall objective is to develop a database of internationally comparable statistics on global investments in health R&D, which can serve as a tool to improve priority setting (Insert 3.7). Specific objectives include the following:

- provide the scientific database needed by research managers to inform decisions on the allocation of scarce resources and to monitor changes in the allocation of resources over time
- complement rather than duplicate existing databases of scientific projects
- emphasize R&D investments that have the greatest potential to reduce the burden of disease among poor populations in developing countries.

Such information will enable regular comparison between the magnitude of health problems and the amount of money invested in finding solutions to these problems. This comparison will serve as an indicator of the appropriateness of R&D resource use and send a powerful message to those who allocate resources between competing R&D needs. The current 10/90 Disequilibrium will then be monitored, and any reductions in the gap will be used as one indicator of better decision-making and priority setting in health.

Insert 3.7

Complementary systems for monitoring health R&D

Feature	CRISP	SHARED	Global System
Nature	Database of scientific projects	Database of scientific projects	Database of financial resources; based on funding institutions worldwide
Objective	Information on projects funded by NIH/USA	To assist interaction among researchers	To inform decision-makers on the allocation of health R&D resources
Dollar amounts	No	No	Yes
Data entry	NIH	Decentralized	Global Forum
Project start	1970s	1995-96	Expected 1999
Donors	U.S.Government	European sources *	Global Forum and partners

** GTZ: German Development Agency; WOTRO-MW: Netherlands Organization for Scientific Research; others*

(Source: A.A.Hyder)

Section 3:

Relevant and appropriate use of resources: cost-effectiveness analysis

1. Rationale

While estimates of the burden of disease and estimates of the resource flows for health R&D are important components of evidence-based priority setting, information about the likely "value for money" of different investments is also critical. Cost-effectiveness analysis helps identify which research projects are likely to produce the greatest improvements in health status for the available resources, and whether the new tool is likely to be more cost-effective than existing ones.

However, for many interventions, no reliable data exist on either costs or effectiveness, and for others, the only data available pertain to developed countries. For virtually no intervention is there good information on the way costs and effectiveness vary according to factors such as the scale of the intervention (for example, 10% coverage for childhood immunization compared to 80%); the cost structure and financing system of different countries; and the epidemiological setting. Although a few attempts have been made to collate the evidence from individual studies, the lack of methodological consistency between studies has made comparison difficult.

Ideally, policy-makers at the country level would have information on the cost-effectiveness of all competing interventions in their local settings. However, since it will not be possible for studies to be undertaken on every possible intervention in every country, it will be necessary to adapt the results of studies undertaken in different settings. Therefore, there is a critical need not only to stimulate individual studies on cost-effectiveness but also to develop methods that allow their results to be transferred and adapted between countries. This work is vital for the development of evidence-based health policies within individual countries, and it can also be used by institutions which fund R&D, to help them set their own priorities for R&D.

The field of cost-effectiveness analysis in health research is one component of the analytic work supported by the Global Forum. A number of activities and projects already under way involve the application of cost-effectiveness analyses at two different but equally important levels. One is directed towards establishing generic methods and their application to interventions in the developing world, and the other is a disease-based application to major global causes of loss of healthy life.

The Ad Hoc Committee examined the cost-effectiveness of several interventions and potential interventions and presented the results in the 1996 report (Insert 3.8). Estimates were presented as the cost in US dollars for a disability adjusted life year (DALY) averted. Thus, cost estimates for a package of the integrated management of the sick child were estimated to double in a middle-income country as compared to a low-income country. At the same time, interventions for malaria generally appeared cost-effective, although this varied according to field conditions.

Insert 3.8
Estimated Cost-effectiveness of Selected Health Interventions

Intervention	Conditions	Cost (US$) per DALY
Integrated Management of the Sick Child		
Package for IMSC	Low-income country	30-50
	Middle-income country	50-100
Malaria		
Impregnated bednets	Government distribution, 50-100% compliance, 25% reduction in mortality	7-14
Chemoprophylaxis	Government distribution	28
Hypothetical vaccine	EPI delivery, 30% mortality reduction, protection for 1-5 years, cost US$ 1-7.5 per child per year	0.40-11
	No EPI delivery, protection for one year, cost US$ 15 per child per year	24

(Source: Ad Hoc Committee Report 1996)

2. Malaria control in Africa: value for money

A study reviewing currently available information on the economic evaluation of malaria control in Africa was supported by the Global Forum and presented at Forum 2.[9] This work focused on the cost-effectiveness of various anti-malaria measures (vector control, chemoprophylaxis, and case management) in an attempt to draw some general conclusions from results for high- and low-risk transmission areas in Africa. Gross National Product (GNP) levels were also used to further study the impact in three different economic strata. The data were taken from work already completed or published and supplemented by extensive inter-sectoral expert consultation. Results were expressed as "cost per DALY averted". Additional elements such as the indirect effect of such interventions on economic productivity and cost savings were also evaluated.

[9] *Goodman C., Economic evaluation of malaria control in Africa. Presented at the Second Annual Meeting of the Global Forum for Health Research, 25-26 June 1998, Geneva.*

Each malaria intervention studied proved to be cost-effective (less than US$ 150 per DALY averted). Sub-sets of these were highly attractive with cost-effectiveness of less than US$ 25 per DALY averted. The relative cost-effectiveness analysis was affected by factors such as the intensity of transmission, economic status, and current levels of health infrastructure.

These results indicate that:

- Overall, interventions against malaria in Africa are technically feasible and generally cost-effective.
- Cost-effectiveness is affected by a number of factors such as intensity of transmission, economic status, etc.
- Cost-effective packaging of such interventions will have to be done with knowledge of local circumstances.

Despite their cost-effectiveness, the total costs of implementing such interventions at high coverage levels can be quite high (Insert 3.9). The total cost of implementing insecticide-treated bednets, residual spraying, or chemoprophylaxis for children would be extremely expensive for any government. This is a challenge beyond the issue of cost-effectiveness and involves the reallocation of total budgets and mobilization of new funds for such interventions. However, it is the search for cost-effective interventions that makes such assessments possible and useful. It is also this process that allows for the identification of interventions which are both cost-effective and have low total costs, such as chemoprophylaxis of pregnant women through ante-natal programmes (Insert 3.9).

While conclusions from such analytic work on cost-effectiveness are critical to decision-making, it is recognized that decisions cannot be made solely on the basis of this type of information on cost-effectiveness. There is also a need to consider the availability of local resources, budget levels, and management issues.

Insert 3.9

Malaria control in Africa: total costs of cost-effective interventions at 100% coverage

Target population	Delivery system or location	Malaria intervention	Total cost as % of total health budget (%)
Under 5 years of age	Typical low-income nation	Insecticide-treated nets	50
		Residual spraying	80
	Community Health Workers	Current chemoprophylaxis	20-45
Pregnant women	Ante-natal clinics	Current chemoprophylaxis	0.25
		More effective (new drug) chemoprophylaxis	1.2

(Source: Goodman et al.,1998)

3. Comparative cost-effectiveness of health interventions: development of a standardized methodology

The Global Forum has attempted to help fill the gap in the development and application of cost-effectiveness analysis methods in health, especially health R&D. One outcome of this is the launch of a study on the cost-effectiveness analysis of health interventions in developing countries.[10]

The overall objective of this project is to stimulate the development of a comparative database showing the cost-effectiveness of interventions that could contribute most to improving health status. More specific objectives are to:

- develop a standard methodology for use in all studies, thus enabling comparison between results
- stimulate a series of studies on priority topics using this methodology (or, where possible, recalculate the results of different studies to make them consistent with the agreed methodology)
- develop a method for adapting the results of studies undertaken in one setting to other settings where cost structures, the scale of the intervention, the availability of facilities, and other variables may differ
- develop (as an interim goal) a set of cost-effectiveness estimates for different regions of the world with varied epidemiology and cost-structures.

A workshop involving the selected teams was held in Geneva after Forum 2 and a draft set of guidelines was discussed at the meeting. Over the next year, the teams will use these guidelines in their studies and the guidelines will then be modified if necessary before final publication in 1999. These case studies will help facilitate the establishment of the database and methods for ensuring the international transferability of results. The results of these studies will be available in late 1999, and it is hoped that this body of work will encourage additional donors to invest in the expansion of the database. Seven teams are currently participating in this project (Insert 3.10).

[10] *Evans D.B., Comparative cost-effectiveness study: standardized methodology and case studies. Presented at the Second Annual Meeting of the Global Forum for Health Research, 25-26 June 1998, Geneva.*

Insert 3.10
Participants in Global Forum study on cost-effectiveness of health interventions in developing countries

Institution	Title of project
All India Institute of Medical Sciences	Cost-effectiveness of hypertension control in developing country populations
Johns Hopkins University	Road traffic injuries in the developing world
London School of Hygiene and Tropical Medicine	Cost-effectiveness of HIV/AIDS prevention strategies
London School of Hygiene and Tropical Medicine	Health care to improve the outcomes of labour, delivery, and postpartum (LPD)
Mexican Institute of Social Security	Cost-effectiveness analysis of health interventions for preventing work injuries
Ministry of Health Education and Communication Centre	Cost-effectiveness study of pap smear screening in Malaysia
PATH Canada	Cost-effectiveness of micronutrient interventions

Meanwhile, a collaborative study, involving WHO, the World Bank, and Harvard University has reviewed the recommended methods for cost-effectiveness analysis suggested by contemporary experts (e.g. Gold et al. 1996). While these methods are very useful for individual countries wanting to make small changes to existing health priorities, they are not appropriate for countries that want to re-evaluate large parts of their health portfolios. Because existing guidelines on cost-effectiveness analysis are designed to evaluate small changes in research portfolios, they may lead in the wrong direction when used in conjunction with a more extensive review of the entire health research agenda.

In early 1998, a consultation was held with experts involved in the development of existing cost-effectiveness guidelines, to discuss proposed changes. A draft set of guidelines for countries wishing to re-evaluate their entire portfolios is now under preparation and will be presented to a wider audience of practitioners and revised accordingly. The project will also involve the production of a separate database of a number of major interventions for various regions of the world where epidemiological conditions and cost structures are likely to be relatively homogeneous.