

Unit 1

Approaches to Priority Setting

Introduction

Over the last decade, priority setting for health research has gained an increased interest and visibility, at the national, sub-national and global level. Since the publication of the Report of the Commission on Health Research for Development (CHRD 1990), *Health Research: Essential Link to Equity in Development*, a number of initiatives have addressed important questions in the field of priority setting, some of which are summarized below:

- The Commission on Health Research for Development (1990) introduced Essential National Health Research as a value-driven strategy and critical tool for countries “to understand their own problems, to enhance the impact of limited resources, to improve health policy and management, to foster innovation and experimentation, and to provide the foundation for a stronger developing country voice in setting international priorities” (CHRD 1990: 85). The successor of the Commission – the Council on Health Research for Development (COHRED) – facilitated a number of country experiments and experiences in health research priority setting. The analysis of these country initiatives led to the production of a manual for research priority setting using the ENHR strategy (COHRED 2000).
- The Ad Hoc Committee on Health Research, convened under the auspices of the World Health Organization, developed a five-step process “to inform decision making about the allocation of research and development (R&D) resources to and within a problem area” (Ad Hoc Committee 1996: 6).
- The Visual Health Information Profile (VHIP) was introduced and promoted by the WHO Advisory Committee on Health Research (1997).
- The Global Forum for Health Research has organized several discussions about health research priority setting. On the basis of an analysis of existing approaches, it has developed a Combined Approach Matrix (GFHR 2000), which has been field-tested.

An increasing number of countries, agencies and programs have initiated priority-setting processes. A few examples illustrate this development:

- During the last decade, more than 20 developing countries, facilitated directly or indirectly by COHRED, embarked on national priority setting processes, some of them including sub-national components.

- The Ad Hoc Committee on Health Research applied its five-step process to key health challenges facing governments and health systems and identified priorities for R&D.
- Several WHO programs, including the Special Programme on Human Reproduction Research, organized processes to set priorities for their work in a specific problem area, using a variety of methods.
- The Global Forum, in collaboration with WHO, applied its Combined Approach Matrix to a specific disease (tropical diseases) and to risk factors or determinants of a health problem (indoor air pollution).
- At the INCLEN Global meeting (Egypt, February 2002), the International Network of Clinical Epidemiology (INCLEN) emphasized the idea of equity-oriented health research. The meeting encouraged research groups to include equity as one of the criteria in selecting, designing and conducting new research projects.

The above sample of methodological developments and priority setting efforts by countries, agencies and programs illustrate that the field of health research priority setting is evolving constantly, identifying new questions and formulating innovative answers.

Practical and Learning Objectives

1. To develop a better understanding of the major available priority setting approaches, the level of action for which they are most appropriate and what is required to implement them.
2. To select appropriate sources of information for a comprehensive and balanced situation analysis as a major input into the process.
3. To identify, select and weight criteria that could be used in priority setting exercises.
4. To complete successfully a priority setting exercise, by using the annex of Item 2 in the Recommended Readings.
5. To share the above knowledge and skills with others.

Overview of Three Major Approaches to Priority Setting

Taking into consideration the needs of potential major users of this module (countries, institutions, programs, networks and agencies), three major approaches to priority setting are described in this section.

The ENHR Approach

Who developed the approach?

The Council on Health Research for Development (COHRED) was established in 1993 as a non-governmental organization to advocate and facilitate the implementation of Essential National Health Research (ENHR). Working with developing countries, COHRED bases its approach on three key messages that drive its mission and way of working:

- put countries first
- work for equity in health
- make research an active part of development

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Why?

In reviewing country experiences with priority setting, it was noted that criteria for priority setting varied from country to country, that few countries had specific guidelines on how to apply criteria and that most countries did not specify who developed the criteria nor on what objective and ethical basis decisions were made. Against this background, COHRED decided that country experiences needed to be reviewed and improved in order to systematically guide current and future country efforts in developing and implementing their research agenda.

What information?

The process of setting priorities using the ENHR strategy requires the best currently available and locally specific information, and should address issues of equity. To establish an effective priority setting process, an evidence-based situation analysis, is required on three broad categories, namely, health status, health care system, and health research system. Sources of information that contribute to such situation analyses are described below.

Health status

Information on health status draws on available information to describe the state of health, the main health problems and the common diseases affecting a country, a province or a district. The objective is to generate descriptive information on the type, distribution and trends in disease, paying attention to such issues as geography, income and social class, gender and age group. Similarly, it is important to identify, where possible, the determinants or risk factors involved. Sources of information include: vital registration systems, special surveys, clinical hospital records and informed opinion.

Health care system

Since the health care system is the mechanism responsible for delivery of care, information about its current status, deficiencies and problems is essential, particularly for research programs with a focus on service delivery, intervention and policy. The four major functions of the health care system – governance, capacity development, financing and production and management and use of knowledge - offer a viable framework for collecting and organizing this information. Information about the health care system can generally be found in official statistics of the country's Ministry of Health or related Ministry. The World Health Report, published annually by WHO, includes a series of data about certain aspects of the health care system, which are produced by WHO “using the best available evidence”.

Health research system

Under this category, information has to be collected to address such questions as: What areas of research are being developed? Who is doing this work? Where does the money come from? How much money is granted to different kinds of research? Answers to these questions will provide a baseline for monitoring changes in the allocation of resources towards priority health research issues.

The situation analysis should be based on quantitative as well as qualitative data inputs. For instance, the WHO/ World Health Report 2000 on “Health Systems: Improving Performance” constructs its analysis around a number of quantitative data and related indicators, such as fairness of financial contribution, health accounts, health system attainment. Finally it should be noted that “...demand-side thinking is its primary underlying philosophy, focusing on an analysis of health needs, people's expectations and societal trends, in contrast to supply-thinking alone, with its focus on new knowledge and new technology...”(COHRED 1997: 4).

Which criteria?

Priority setting, by its very nature, is a political process. The “how” of making rational choices and judgements is one of the most difficult steps in priority setting. This is essentially a two-step process: the selection of criteria and the application of the criteria to select research topics for priority areas.

Selecting criteria

The review of country experiences in health research priority setting indicated that the use of criteria varied from country to country. This ranged from the total absence of explicit criteria to a long list of criteria (for an overview of examples of criteria used in health research priority setting see Tools and Resources, Item 1). Most of these criteria can be grouped in one of the following categories (COHRED 2000: 17):

- *appropriateness: should we do it?*
Criteria in this category include: ethical and moral issues, human rights issues, legal aspects, political acceptability and adequacy and usefulness of the current knowledge base.
- *relevance: why should we do it?*
Includes criteria like: community concern, magnitude and severity of the problem, responsiveness to the national health policy and equity focus.
- *feasibility: can we do it?*
The feasibility of carrying out the research in terms of the technical, economic, political, socio-cultural and ethical aspects.
- *impact: what do the stakeholders get out of it?*
This category includes criteria like short- and long-term benefits, as well as issues of affordability, efficacy, effectiveness, equity and coverage

The selection of the final criteria will depend on the purpose and level of action of the priority setting initiative (e.g. global, national, community or institutional), the availability of information related to the specific criterion and the ability to define and measure the criteria in a common language or framework. Guidelines for selecting criteria are included in Item 1 in the Tools and Resources section.

Selecting research topics from priority areas

In assembling research areas to be considered, efforts should be made to cluster health (care) problems into equivalent and meaningful levels so that priority areas are not chosen merely by the breadth and magnitude of the topics covered under a cluster. For example, the area of safe motherhood is much broader, as compared to single disease entities like leprosy or measles. By this fact alone, it is more likely to be in the priority research agenda.

In selecting research areas, either of two approaches, or a combination of both, can be used (COHRED 1997). In the first approach, participants can define a “sampling frame” to facilitate the identification of research areas and, more importantly, to determine what is missing, e.g. the disease listing prepared by the Ad Hoc Committee in the estimation of DALYS for different countries. The second approach is to institute a nomination process where different groups and individuals can suggest potential priority areas.

Who should be involved?

Groups of stakeholders who should be involved, besides researchers themselves, are the potential users and the people affected by the research results. Country experiences indicate that generally four categories of participants have been involved:

- researchers,
- decision makers at various levels,
- health service providers and
- communities.

Two additional remarks:

1. This approach presupposes the involvement of participants with different paradigms for decision making, such as the bio-medical and epidemiological, the economic and the socio-cultural and behavioural model.
2. The choice of participants is furthermore dependent on the level of the health system addressed – for example, the macro-system or national level versus the local or community level.

Lessons learned

Information used

- The situation analysis has a tendency to be biased towards the supply side of health and the health care system, and should be balanced with analysis on the demand side, including health needs, people's expectations, societal trends and values.
- Information/data about inequities in health and health care are in most cases not included, thereby raising questions about the underlying value of the methodology.
- The methodology has not up to now addressed the issue of extrapolation of sub-national data to the national level and vice versa.

Criteria

- There has been considerable work on elaborating, mapping out and listing of potential criteria for priority setting, but relatively little has been done on how to select and apply criteria in practice.
- The elaboration and understanding of potential criteria for priority setting is more advanced than the process of and guidelines for selecting criteria.
- In view of the above noted absence of information/data about health inequities, explicit criteria to reflect the promotion of equity and development need to be constructed.

Involvement

- A more substantive involvement is needed for the private sector (e.g. industry, professional associations), parliamentarians, donors and international agencies, which have been underrepresented up to now.

Exercise 1: Critical Analysis of Existing Experiences in Priority Setting

1. Select from the COHRED website (<http://www.cohred.ch>) under “Documents” a country report on priority setting.
2. Read the report and answer the following questions:
 - Which type of information has been used for the priority setting?
 - Which criteria (if at all) were applied for setting priorities?
 - Which stakeholders were involved?
3. Write a one-page summary, including critical reflections, of the priority setting process in that particular country.

The Five Step Process

Who developed the approach?

The Ad Hoc Committee on Health Research Relating to Future Intervention Options was formed in 1994 under the auspices of the World Health Organization, in response to several requests for a broad-based review of needs and opportunities for R&D in the health sector, including the World Bank’s World Development Report 1993 *Investing in Health*. After the publication of its report in 1996, the Committee ceased to exist.

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Why?

The Report (Ad Hoc Committee 1996) is intended as a resource to assist decision making by governments, industry and other investors in allocating funds to, and

within, health R&D. The Report emphasizes global priorities since "...it is essential to complement national assessments with a global one..." (1996: 4).

What information?

The approach suggests five steps to inform decision-making about the allocation of R&D resources to and within a problem area. The description of these steps illustrates the type of information, needed for and used by this approach:

Step 1. Calculate the burden of the conditions or risk factor: *Magnitude*

Measure the disease burden as years of healthy life lost due to premature mortality, morbidity or disability. The report used the DALY (disability adjusted life year) as its main unit, but other summary measures, such as HEALYS (healthy life years) and QUALYS (quality-adjusted life years) can be used as well. The global burden of disease analysis, included in the report, results in an information base of about 500 different conditions or sequelae of diseases, which have been grouped into 96 detailed causes and, in addition, a variety of cause groups or clusters (communicable, noncommunicable, injuries). The information made available in this way refers to healthy life years lost as a consequence of morbidity and mortality.

Step 2. Identify the reason why the disease burden persists: *Determinants*

Analyse the factors (determinants) responsible for the persistence of the burden, such as lack of knowledge of the condition, lack of tools, failure to use existing tools, or factors outside the health domain. Within the global burden of disease analysis, the comparative risk assessment (CRA) methodology has been developed. This is a systematic evaluation of the changes in population health that result from modifying the population distribution of exposure to a specific risk factor or group of risk factors. The Global Disease Burden 2000 Study selected 20 risk factors/determinants, including factors such as alcohol use, blood pressure, air pollution, unsafe water, etc.

Step 3. Judge the adequacy of the current knowledge base: *Knowledge*

Assess the current knowledge base to solve the health problem and evaluate the applicability of solutions, including the cost and effectiveness of existing interventions.

Step 4. Assess the promise of the R&D effort: *Cost-effectiveness*

Assessment includes consideration of the expected cost-effectiveness of the potential intervention as well as the probability of successful development of the intervention. Cost-effectiveness analysis provides information on which interventions are likely to provide the greatest improvements in health for the available resources. It requires the following information:

- the extent to which current and potential interventions improve population health (effectiveness).
- the resources required to implement the intervention (costs).

Through its recent CHOICE project (Choosing Interventions that are Cost-Effective), WHO is assembling regional databases on the costs, impact on population health and cost-effectiveness of key health interventions.

Step 5. Assess the adequacy of the current level of effort

Calculate the present level of investment in research for specific diseases and/or determinants. This information category refers to levels of resource allocation to R&D or “resource flows”, for particular health problems and/or different types of research.

What criteria?

Central in this approach are the criteria of:

- burden of disease and determinants,
- performance of the system and
- financial flows.

Burden of disease and determinants

In order to qualify for a burden of disease analysis, the condition should meet one or more of the following criteria: epidemiologically significant, requiring a significant amount of health service provision or a significant factor in current health policy debates. Determinants are selected on the basis of the following criteria:

- among the leading causes of disease burden,
- neither too specific nor too broad,
- high likelihood of causality,
- reasonably complete data and
- potentially modifiable.

Performance of the system

One of the following criteria can be used to monitor health system performance (Ad Hoc Committee 1996: 82):

- efficiency, which can be gauged in terms of share of the country’s GNP it consumes and the health outcomes, but also in terms of the cost-effectiveness of the interventions;

- equity, to be gauged in terms of the extent to which services are accessible to the population in need of them;
- quality, which can be gauged in its technical dimension – through the extent to which it is effective and achieves the health gains expected – and its interpersonal dimension – through the satisfaction of users.

Financial flows

No further criteria developed (as yet).

Who should be involved?

The Ad Hoc Committee applied the five-step process outlined in its report to a number of selected health problems and pointed to the desirability of adopting a systematic approach, but did not address, either directly nor indirectly, the issue of who should be involved in such a systematic approach. The description of the approach and methods suggests, however, that the approach is strongly expert-driven, for example:

- the analysis of burden of disease (step 1) refers explicitly to “epidemiologists”
- the identification of determinants (step 2) requires “the judgement of field experts”
- the assessment of the knowledge base (step 3) relies on “the subjective judgement of informed scientists”
- data on cost and effect (step 4) are being developed “for analysts from different countries”.

Lessons learned

- The approach aims explicitly to offer a rational and systematic process for setting *global* health research priorities. It recognizes the need for and importance of national agendas for research, but emphasizes at the same time that it is essential to complement these national agendas with a global one.
- The approach is intended “to contribute to an agenda for international action in which individual nations’ agendas inform global priorities, and global needs and experience influence national agendas” (Ad Hoc Committee 1996: xxi). Methodological issues related to this interface between global and national priority setting are, however, not addressed by this approach.
- The burden of disease analysis, which is a central component in the approach, has been enlarging in a significant way the information base available for

research priority setting, at the national as well as global level. The use of this information to guide research priority setting and funding allocation has been, however, limited and restricted at both levels.

- While there has been progress in the development and application of tools for burden of disease measurement, new methodological challenges, related to contextual measurement, co-morbidity and risk assessment, have been identified and require further refinement of currently available tools.
- Considering its expert-driven character, the approach requires a considerable and varied critical mass of “experts” for its application. It also raises questions about the involvement of other stakeholders in the priority setting process.

Exercise 2: Selecting Criteria for Priority Setting

1. Identify three problems/areas/topics on which you would like to develop research projects.
2. Review the guidelines for selecting criteria for priority setting (see Tools and Resources, Item 2).
3. Select and justify the criteria that you will apply to prioritize your areas of interest for initiating research.

Combined Approach Matrix

Who developed the approach?

As a response to the recommendations made by the Ad Hoc Committee on Health Research, the Global Forum for Health Research was established in 1998 with the following objectives "...to bring partners together to help focus research efforts on the health problems of the poor through an improvement in the allocation of research funds, support of better priority setting processes and methodologies, promotion of relevant research, support for concerted efforts in health research and dissemination of the research findings..." (GFHR 2000: 147).

A review and discussion of tools, methods and processes for health research priority setting has been on the agenda of the various GFHR annual meetings.

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Why?

The Combined Approach Matrix was developed as a framework to integrate and summarize information obtained through a variety of priority setting processes. (GFHR 2002: 63). In particular, it aims to incorporate criteria and principles for priority setting defined in the ENHR approach, the Visual Health Information Profile proposed by the WHO Advisory Committee on Health Research, and the five-step approach of the Ad Hoc Committee on Health Research. The aim is "...to use priority setting techniques to gain as many years of healthy life as possible for a given investment in health research (GFHR2002 : 86).

What information?

The Combined Approach Matrix requires analysis of information in five steps, with each step applied to four levels, namely: the individual, family and community; health ministry, research institutions, health systems and services; sectors other than health; and central government and macroeconomic policies (GFHR 2000: 37-8).

1. Situation analysis: calculating the burden of diseases and collecting macro-data on factors affecting health.

This is basically the same as Step 1 of the Ad Hoc Committee approach. In addition, the Visual Health Information Profile is constructed. This Profile contains five main categories of indicators: indicators of disease conditions and health impairment,

indicators of health care systems, environmental determinants, food and nutrition and socio-cultural characteristics.

2. Filling the Combined Approach Matrix table for each major disease

The information collected in Step 1 is used to fill a matrix table for each major disease or determinant. The matrix table comprises four questions, each applied to four sets of “actors”. The five questions are:

- Why does the burden of disease persist?
- What is the level of knowledge regarding existing and potential interventions and their cost effectiveness?
- Is research likely to produce more cost-effective interventions?
- What is the resource flows for that disease/risk factor?

These four questions would be applied to four levels of intervention, namely:

- individual, family, community;
- health ministry, health systems and services, health research community;
- sectors other than health with a major impact on health and
- central government and macro-economic policies.

3. Identifying the priority research areas for each disease.

Based on the matrix table completed for each disease or determinant, research areas likely to have greatest impact on health are identified

4. Comparing key factors across tables.

Comparison across tables facilitates identification of research areas that would benefit several diseases at the same time.

5. Defining the priority research projects

Research projects having greatest impact in reduction of burden of disease can be identified.

What criteria?

In the construction of the Combined Approach Matrix, the following criteria for priority setting are identified (GFHR 2000: 34-5):

- burden of disease, measured by DALYS or other indicators.
- analysis of determinants of disease burden (at the four intervention levels).

- cost-effectiveness of interventions, measured in terms of DALYS saved.
- effect on equity and social justice (effect on equity not directly measured as yet).
- ethical, political, social, cultural acceptability.
- probability of finding a solution.
- scientific quality of research proposed.
- feasibility (availability of human resources, funding, facilities).
- contribution to capacity strengthening.

The pilot testing of the Combined Approach Matrix by some Disease Control Coordinators in WHO, demonstrated that this approach facilitated a balanced consideration of various criteria, for example by highlighting that cost-effectiveness should not be regarded as the over-riding criteria but should be considered alongside disease burden, reasons for persistence and level of knowledge. (GFHR 2002: 63).

Who should be involved?

As described earlier in the Ad Hoc Committee example, there is a need to involve 'epidemiologists' for the analysis of burden of disease (step 1), for the identification of determinants (step 2) one requires "the judgement of field experts", the assessment of the knowledge base (step 3) relies on "the subjective judgement of informed scientists" and data on cost and effect (step 4) are being developed "for analysts from different countries". However, to fill the vertical columns in the Combined Approach Matrix, there is need to involve opinion leaders, civil society representatives, health managers, researchers, and senior policy planners from health and other related government departments. Currently there is limited experience in involving all of these different stakeholders.

Lessons learned

Where the ENHR approach focuses on the national level and the Ad Hoc Committee approach on the global level, the Combined Approach Matrix aims to offer a methodology, that could be applicable at both global and national levels. This could contribute to a streamlining of the priority setting process, and in particular to a more effective interfacing between both levels. However, as yet, there is no practical experience in achieving such interfacing.

The introduction of four intervention levels enlarges in a significant way the information base for priority setting and contributes in particular to bringing the

burden of disease within a social, cultural, environmental and political context. To make optimal use of this broad information base, a major challenge will be in linking this information to specific criteria for priority setting. The methodology for achieving such linkage needs to be developed.

The field-testing at the global level confirmed the applicability of the approach to specific disease/illness conditions and risk factors or determinants of health.

- This approach in its present stage of development serves more as an effective tool in “highlighting the most important gaps in the information needed to make evidence-based decisions (GFHR 2002: 63)”, thereby helping identify research priorities and needs to develop guidelines for selecting criteria and research topics.
- The examples given here echo that this approach is also expert-driven. However, the conceptual framework of this tool strongly argues for involvement of all stakeholders.

Exercise 3: Using Criteria for Priority Setting

1. Select one of your research projects.
2. Review the full module entitled “How to use criteria for research priority setting”, included in annex of Recommending Reading Item 2.
3. Apply the full module to the selected research project and assess/calculate its priority character.

Comparative Analysis of Approaches¹

Issues	A. ENHR	B. Five Step Process	C. Combined-Matrix
1. Rationale	To systematically guide current and future country efforts in developing and implementing their research agenda	To assist decision-making by governments, industry and other investors on the allocation of funds to, and within, health R & D. To complement national assessments with a global one.	To incorporate criteria and principles for priority setting of previous approaches into a combined one. To use priority setting techniques to gain as many years of healthy life as possible for a given investment in health research
2. Level of application	National and sub-national	Global	Global (disease, determinants/risk factors)
3. Information used	Quantitative and qualitative data in relation to; <ul style="list-style-type: none"> • health status, • the health care system • the health research system Particular focus on analysis of health needs, people's expectations and societal trends (demand side)	Burden of disease (DALY). information about 20 risk- factors and determinants, such as alcohol use, blood pressure, unsafe water etc. Knowledge base about the health problem. Cost-effectiveness of current and potential interventions. Resource allocation to R & D on specific health problem.	The same information as the Five Step Process, but applied at four levels of intervention: <ul style="list-style-type: none"> • individual, family and community • health ministry, health systems and services, health research community • sectors other than health • central government and macro-economic

¹ Section 5.0 in the Tools and Resources section of this Unit provides an alternate comparative analysis of the priority-setting using different dimensions of analysis for comparing the approaches developed by ENHR, Ad Hoc Committee on Health Research and the Global Forum for Health Research (Combined Matrix (GFHR, 2002. Insert 4.1). -

			policies
4. Criteria	<ul style="list-style-type: none"> • <i>Appropriateness:</i> ethical and moral issues, human rights issues, legal aspects, political acceptability, adequacy and usefulness of the current knowledge base. • <i>Relevance:</i> magnitude and severity of the problem, responsiveness to national health policy, equity focus. • <i>Feasibility:</i> technical, economic, political, socio-cultural and ethical aspects. • <i>Impact:</i> affordability, efficacy, effectiveness, equity and coverage. 	<p>Burden of disease: Epidemiologically significant, requiring significant amount of health service provision, Significant factor in policy debates.</p> <p>Determinants: leading causes of disease burden, High likelihood of causality, available data, Potentially modifiable.</p> <p>Performance of the system: efficiency, equity, quality.</p> <p>Financial flows.</p>	<p>As specified in the theoretical model:</p> <ul style="list-style-type: none"> • burden of disease • determinants of disease burden • effect on equity • ethical, political, social, cultural acceptability • probability of finding a solution • scientific quality • feasibility • contribution to capacity strengthening <p>As applied in the piloting: research projects that have the greatest impact in lowering the burden of disease</p>
5. Actors	<p>Researchers Decision makers Health service providers Communities</p>	<p>Experts (scientists)</p>	<p>Experts (scientists) – current experience. Potentially should involve also, all stakeholders as in ENHR</p>
6. Reference document	<p><i>Essential National Health Research and Priority Setting: Lessons Learned,</i> COHRED Doc 97.3</p>	<p>Ad Hoc Committee on Health Research, <i>Investing in health research and development,</i> WHO, 1996</p>	<p>Global Forum for Health Research, <i>The 10/90 Report on Health Research 2002,</i> (chapter 4), 2002</p>

Concluding Remarks

Since the Commission on Health Research for Development recommended in its final report that "...any process designed to set priorities should not lose sight of the fundamental question: whose voices are heard, whose views prevail and, thus, whose health interests are advanced..." (1990: 44), a number of approaches have been taken to addressing the issue of health research priority setting. The above analysis of three major approaches leads to the following concluding remarks:

- Each of the three approaches represents both a mixture of methods and tools and of process elements. While methods and process can (and should) be differentiated, each approach illustrates that both components are interrelated and how they influence each other.
- The three approaches are rational; they collect all available information on what is needed and what is possible, identify objectives and collect data on what value is placed on these objectives by various groups. The three approaches require an adaptation of their methodology to the context (level, area, type of problem) they are addressing.
- Identifying and ranking of health research needs can be done in terms of health problems and/or from a health system perspective, including supply, demand and the mediating organizations. The three approaches recognize both perspectives, but balance them with different weights and also use somewhat different, though overlapping information bases.
- Giving predominance to a health problem/disease perspective in priority setting results automatically in a higher ranking for categories of diseases, risk factors, technologies and health interventions and those categories of research addressing these categories, while cross-cutting health system issues do not achieve the same accumulative importance. Any priority setting initiative should therefore work out a proper balance between both perspectives, with a systematic approach within each one, possibly with different criteria
- The three approaches recognize the need for criteria as the means by which health research needs can be ranked. They also formulate a series of such criteria, and there is considerable similarity in the criteria used in the different approaches. However, the questions of how to select and rank these criteria, and, even more importantly, which underlying values are expressed by these criteria (e.g. equity versus cost-effectiveness) are more or less ignored by the three approaches. Given the fact that priority setting is basically a political process, any priority setting initiative should therefore address explicitly the issue of underlying values.
- Finally, the importance of involving all stakeholders in the (different phases of the) priority setting process is unanimously recognized, but the

methodologies and tools to achieve this have been addressed and developed only marginally. Future priority setting exercises should make more explicit efforts to innovate in, experiment with and document this important aspect of the priority setting process.

References

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Recommended Readings

1. Ad Hoc Committee (Ad Hoc Committee on Health Research Relating to Future Intervention Options). 1996. *Investing in Health Research and Development*. Geneva: World Health Organization. TDR/Gen/96.

This Report is the outcome of a review of health needs and related priorities for research and development in low-income and middle-income countries. It is intended as a resource to assist decision-making by governments, industry and other investors in the allocation of funds to, and within, health R&D. The report explains the methods the Ad Hoc Committee has been using to assess R&D needs and opportunities, in particular the five-step approach.

2. COHRED (Council on Health Research for Development) 2000. *A Manual for Research Priority Setting Using the ENHR Strategy*. Geneva: Council on Health Research for Development, COHRED Document No. 2000.3, Pages: 47.

This manual provides facilitators of a health research priority-setting workshop, with a step-by-step guide, for successfully leading the process. Starting with the preparatory work needed for a priority setting exercise, the manual continues by discussing elements for priority setting, criteria for priority setting, the follow up activities after the priority setting exercise and the implementation of the research agenda. The annex of the publication includes modules on how to use criteria for research priority setting.

3. COHRED (Council on Health Research for Development) 1997. *Essential National Health Research and Priority Setting: Lessons Learned*. Geneva: Council on Health Research for Development, COHRED Document No. 97.3.

Experiences in priority setting continue to accumulate worldwide. While the conceptual framework, perspectives and practices of priority setting may differ from country to country, its impact is common to all – it is guiding them in planning their health research programs, in mobilizing and allocating their research resources and in strengthening local research capacity. This monograph is the outcome of the COHRED Working Group on Priority Setting. It can be used by different stakeholders at district, national and global levels, to guide them in a process, which has as its ultimate goal the achievement of equity in health and development.

4. GFHR (Global Forum for Health Research) 2000. *The 10/90 Report on Health Research 2000*. Geneva: Global Forum for Health Research. (Particularly Chapter 2, entitled “Complementary approaches for priority setting in health research: review and perspectives”)

The 10/90 Report 2000 describes the progress made by the partners in the Global Forum in the past year to help correct the 10/90 gap by focusing on research activities and initiatives that address health problems of middle and lower income countries. Chapter 2 reviews major efforts in the past decade to systematize the approach to priority setting in health research, including ENHR, the Ad Hoc Committee and the Advisory Committee

on Health Research. A comparison is made of these approaches, indicating their common denominators and main differences.

5. GFHR (Global Forum for Health Research) 2002. *The 10/90 Report on Health Research 2001-2002*. Geneva: Global Forum for Health Research. (Particularly Chapter 4, entitled “Progress in priority setting methodologies”)

This Report updates the 10/90 Report 2000 and includes a more detailed description of the Global Forum Combined Approach Matrix.

6. Bruce, N. 2001. Indoor air pollution and health: Applying a framework to identify research priorities for health and other sectors, Presentation, Forum 5, Geneva, 9-12 October 2001.

This paper, presented and discussed at Forum 5 (Geneva, 2001), reviews the application of the Combined Approach Matrix to the problem of indoor air pollution in developing countries. It analyzes determinants, identifies research under the headings of the five-step approach, as proposed by the Ad Hoc Committee, and does this at four levels of intervention. The paper assesses strengths and weaknesses of the approach and makes recommendations for how the method might be further developed.

Tools and Resources

1.0 Examples of Criteria Used in Health Research Priority Setting

(Source: COHRED (Council on Health Research for Development) 2000. A Manual for Research Priority Setting Using the ENHR Strategy. Geneva: Council on Health Research for Development, COHRED Document No. 2000.3, Page 13.)

This list of criteria could facilitate brainstorming and decision-making on criteria, which will be used in a specific health research priority setting process.

1. Adequacy and usefulness of current knowledge base (avoiding duplication)
2. Applicability of the research outcome
3. Availability of cost-effective interventions
4. Capacity of the system to carry out the research
5. Community concern/demand
6. Economic impact
7. Environment health and socio-political effects
8. Equity focus
9. Ethical and moral issues
10. Feasibility
11. Funding support
12. Human rights issues
13. Impact on health
14. Impact on development
15. Justification of the cost/investment
16. Justification of time
17. Legal aspects
18. Magnitude of the problem
19. Obligation and professional responsibility
20. Operational effectiveness
21. Partnership building
22. Persistence of the problem
23. Political will/acceptability/commitment
24. Relevance
25. Responsiveness to the National Health Policy or national goals
26. Research capacity building
27. Research utilization
28. Urgency

2.0 Guidelines for Selecting Criteria

(Source: COHRED. 1997. *Essential National Health Research and Priority Setting: Lessons Learned*. Geneva: Council on Health Research for Development, COHRED Document No. 97.3, Pages 35-7.)

Guidelines are formulated to answer the questions:

- Which criteria are to be used?
- Will criteria be assigned equal or different weights?

A. Which criteria are to be used? The following characteristics of criteria should be considered:

1. Determine the purpose for priority setting and the level of action at which it is being done (that is, whether at global, national, district or sub-district levels). Global agenda would generally have as a criterion the extent to which a health problem is shared by many countries (burden of illness), and would include a bigger share of strategic research that many developing countries may not be able to undertake on their own. On the other hand, priorities at the country level might consider relevance to the National Health Plan as criterion. Or, if the research agenda is used as a basis for obtaining funds, then it may be important to include 'fundability' by research and donor agencies as one, although not the most important criterion.
2. Criteria should be defined in detail. In practice, it is easier to apply the criteria when they are in the form of specific questions. For example, the term 'cost-effectiveness' is interpreted in many ways; hence participants should try to reconcile varying notions and perceptions by working on a common definition. The next step is to formulate specific questions, for example: Is the research cost-effective? Or, is the intervention that is likely to result from the research cost-effective? These are two different questions altogether.
3. To the extent possible, the criteria should be independent of each other. For example, the magnitude of the problem and its urgency are often interrelated. It could happen that a health problem scores highly on both criteria, but closer examination might reveal that the magnitude of the problem may be driving participants to look for urgent answers and action. Another example is the interaction between the magnitude of the problem and the expected impact of the research results; the latter may score highly because success in the research intervention affects a large number of the population. This 'double-counting' effect might be minimised to some extent by having the participants discuss and agree on the definitions and delimitations of the criteria used.
4. All the criteria need an information base, both qualitative and quantitative. The language used to describe the information base should be understandable to the community to enable them to participate in an informed way.

5. There should be explicit criteria to reflect the promotion of equity and development. This is the added value of the ENHR strategy. For example, although the magnitude of a health problem is an important criterion, participants should not overlook diseases common only in marginalized groups or in a few inaccessible localities. Without a consideration of equity issues, such diseases may not rank highly in priority lists, or may even have a very low rank as a result of the multiple effects of the burden of illness on other criteria like expected impact, urgency and cost-effectiveness.
 6. The criteria should be narrowed down to a manageable number of independent criteria. This is because of the generally large information bases, the problem of double counting of criteria, and the difficulty of applying many criteria. One approach is to get the participants' consensus on the core criteria (perhaps 6 to 7), test these on a few research areas, and determine whether the addition of other criteria would change the priorities.
 7. The criteria should be expressed in a common language, which will allow the criteria to be combined in a summative form.
- B. Will criteria be assigned equal or different weights? If no explicit weight is given to each criterion, then criteria may be given equal weights. However, assigning equal weights should be a deliberate decision since it is a powerful way of expressing values and preferences. Differential weighting is another option, generally based on the importance of the criterion in making a choice. Again, this option should be exercised only after insightful deliberation and consensus among the participants.

3.0 The Combined Approach Matrix

The Combined Approach Matrix is useful to incorporate and summarize all information obtained through a variety of methods and approaches.

The Global Forum Combined Approach Matrix to Help Priority Setting for Health Research

Insert 2.7

The Combined Approach: a practical framework for setting priorities in health research

Five Steps in Priority Setting	Data and Analytic Requirements	
I. What is the burden of the disease/risk factor?	Health status Assessment of the burden of disease (DALYs, QALYs, etc.)	
II. Why does the burden of disease (BoD) persist? What are the determinants?	Acquisition of knowledge about disease determinants	
III. What is the present level of knowledge?	What is known today about existing interventions? How cost-effective are they?	
IV. How cost-effective could future interventions be?	Is research likely to produce more cost-effective interventions than the present ones?	
V. What are the resource flows for that disease/risk factor?	Assessment of the public and private resource flows	

Actors/factors determining the health status of a population (intervention levels)

Level of the individual, family and community	Level of the health ministry, health research institutions, and health systems and services	Level of sectors other than health	Level of central government and macroeconomic policies
			Tool of analysis: Visual Health Information Profile (VHIP) proposed by the Advisory Committee on Health Research
Analysis of: <ul style="list-style-type: none"> • Individual determinants • Family determinants • Community determinants influencing the BoD 	Analysis of: <ul style="list-style-type: none"> • Biomedical knowledge • Health policies • Health systems • Health services influencing the BoD 	Analysis of sectoral policies having an impact on the BoD, for example: <ul style="list-style-type: none"> • Education • Environment • Working conditions • Security policies 	Analysis of macroeconomic policies having an impact on the BoD, for example: <ul style="list-style-type: none"> • Budget policies, structural adjustment programmes • Research policies • Good governance
Knowledge about factors influencing the C/E* of interventions at: <ul style="list-style-type: none"> • Individual level • Family level • Community level 	Knowledge about factors influencing the C/E of interventions in: <ul style="list-style-type: none"> • Biomedical research • Health policies • Health systems • Health services 	Knowledge about factors influencing the C/E of interventions in sectors outside health, for example: <ul style="list-style-type: none"> • School training in hygiene • Nutrition campaign • Pollution control 	Knowledge about factors influencing the C/E of changes in macroeconomic policies, for example: <ul style="list-style-type: none"> • Structural adjustment programmes and health • Research policies • Good governance
Estimated C/E of potential interventions at: <ul style="list-style-type: none"> • Individual level • Family level • Community level 	Estimated C/E of potential interventions in: <ul style="list-style-type: none"> • Biomedical research • Health policies • Health systems • Health services 	Estimated C/E of potential interventions in various sectors outside health: <ul style="list-style-type: none"> • School training in hygiene • Nutrition campaign • Pollution control 	Estimated C/E of potential changes in macroeconomic policies, for example: <ul style="list-style-type: none"> • Structural adjustment programmes and health • Research policies • Good governance

* C/E: cost-effectiveness.

4.0 Additional Priority Setting Tools

Many of the following materials can be accessed through the COHRED website at <http://www.cohred.ch> or can be obtained in electronic or print copy from COHRED.

Methodology/ instruments

- 4.1 COHRED. 1997. *Essential National Health Research and Priority Setting: Lessons Learned*. Geneva: Council on Health Research for Development, COHRED Document No. 97.3, Pages: 66.

Experiences in priority setting continue to accumulate worldwide. While the conceptual framework, perspectives and practices of priority setting may differ from country to country, its impact is common to all - it is guiding them in planning their health research program, in mobilizing and allocating their research resources and in strengthening local research capacity. This monograph, is the outcome of the work of COHRED's working group on Priority Setting. It can be used by different stakeholders at district, national and global levels, to guide them in a process, which has as its ultimate goal the achievement of equity in health research for development.

- 4.2 Nuyens, Y. 1997. *Workshop on Priority Setting for Essential National Health Research (PSENHR), Review of Processes, Mechanisms and Outcomes of PSENHR*. Geneva: Council on Health Research for Development, Pages: 23.

In this working paper, the priority setting experiences in nine countries have been analyzed according to the following questions: Who has participated in the exercise? How have the participants been involved? What is the information used to set the research priorities? Which criteria have been used? What was the outcome of the priority setting? This paper has been used for the development of the monograph on priority setting.

- 4.3 COHRED (Council on Health Research for Development) 2000. *A Manual for Research Priority Setting Using the ENHR Strategy*. Geneva: Council on Health Research for Development, COHRED Document No. 2000.3, Pages: 47.

This manual provides facilitators of a health research priority-setting workshop, with a step-by-step guide, for successfully leading the process. Starting with the preparatory work needed for a priority setting exercise, the manual continues by discussing elements for priority setting, criteria for priority setting, the follow-up activities after the priority setting exercise and the implementation of the research agenda. The annex of the publication includes modules on how to use criteria for research priority setting.

- 4.4 The Working Group on Priority Setting/COHRED. 2000. Priority setting for health research lessons from developing countries, *Health Policy and Planning*, 15(2).

This paper is a review of the issues around research priority setting, especially as they relate to health problems of developing countries. The paper proposes a strategy of priority setting, based on lessons learned from ENHR approaches attempted in several developing countries. With equity in health and development as its goal, the proposed model is demand-driven and involves multi-dimensional inputs and multiple stakeholders. Various steps of the process are discussed and the paper concludes with a discussion about the gap between national research priorities and the agenda set at regional and global levels.

- 4.5 COHRED. 2000. *Negotiations for National Research: Making Priorities Matter*, Learning Brief 2000.5, Geneva: Council on Health Research for Development, Pages: 2.

This learning brief deals with the difficulties encountered when national research priorities are not in line with global research priorities.

- 4.6 Alano, B.P. Jr., Almario, E.S. 2000. *Tracking Country Resource Flows for Health Research and Development (R&D), A Comparative Report on Malaysia, the Philippines, and Thailand, with a Manual on Tracking Country Resource Flows for Health Research and Development*. Manila: Center for Economic Policy Research. ISBN 971-508-082-0, Pages: 75.

This publication consists of two parts. The first part is the integrated report drawn from country studies on resource flows for health research and development in Malaysia, Thailand and the Philippines. It presents the findings and highlights the data that can be compared between them. The second part is the manual that presents the method used by the three countries to track their respective health R&D resources. It is addressed to other countries that would like to embark on a similar effort. As such, it explains the different steps involved. Every attempt is made to simplify and make the steps as straightforward as possible.

- 4.7 GFHR (Global Forum for Health Research) 2001. *Monitoring Financial Flows for Health Research*. Geneva: Global Forum for Health Research, ISBN 2-940286-05-1, Pages: 73.

Health research is essential to the design and implementation of health interventions, health policies and health service delivery. Financing health research and development is critical to its success. The information on health research financing is fragmented. This study aims to provide decision makers with an overview of currently available information on resource flows into health research. The main feature of the study is less to provide an overall figure than to describe the process for arriving at these estimates as a basis for further improvements, and to indicate what to expect from the various data sources and research approaches.

- 4.8 Harrison, D. 2000. *Health Research in Tanzania: How Should Public Money be Spent?* Geneva: Council on Health Research for Development, COHRED document No. 2000.9, Pages: 64.

In 1999, the National Forum on Health Research conducted a process of priority setting for health research, which resulted in a list of ranked topics considered to be of high importance in Tanzania. The challenge now remains to translate the list into a research agenda expected to realize greater social benefits. This involves two iterative steps. The first is to define a public investment portfolio of R&D expected to maximize improvements in health. The second is to ensure efficient implementation of the portfolio, so that expected benefits actually materialize. The purpose of this paper is to describe how each step can be carried out.

The report reveals striking opportunities to realize greater returns from current levels of investment in health research. First, there are clear gaps in the present national investment portfolio, both in terms of the scope of funding and the type of R&D instruments employed in addressing priorities. Second, despite pockets of R&D efforts, there is no sustained national program to improve equity of resource allocation and efficient use of existing tools at the local level. Third, communication is constrained by tangible deficiencies in infrastructure, as well as by invisible barriers between research organizations.

Country case studies: Resource flows

- 4.9 Institute for Medical Research, Ministry of Health, Malaysia. 1998. *Resource Flows for Health Research and Development, Malaysian Study: Phase I; Progress Report.* Pages: 21.

This Malaysian case study is part of a COHRED funded multi-country study that tracks resource flows for health research and development (R&D). It responds to the recognition that monitoring resource flows is a key input to any useful discussion on health R&D policy. There is a need to collect, analyze, and disseminate information on health resource flows in order to better address health problems of low- and middle-income countries. The report presents the results of the first phase of the study. It documents the health research priority setting process in the country, and presents the existing health R&D related datasets. The workplan for phase 2 of the multicity study is also presented.

- 4.10 Pongpanich, S., Sitthi-amorn, C. Harr III, H.R., Likitkeerirat, T. 2000. *Resource Flows for Health Research and Development, Thailand Agenda for Health Research and Development, Final Report Phase 2.* Bangkok: The College of Public Health, Chulalongkorn University, Pages: 73.

This study is a first attempt to track health research and development (R&D) funds in Thailand. Using an accountancy framework which traces the flow of funds from fund sources to fund users, the overall objective is to develop a basic methodology for tracing and measuring health R&D funds in a country. It can be used as a tool to streamline and fine tune the allocation of health R&D funds. The study also looked into the priority setting process for health research in Thailand.

- 4.11 Center for Economic Policy Research, Manila. 2000. *Analysis of the Funds Flow for Health Research and Development in the Philippines, 1997-1998, Final Report*. Pages: 111.

This study is a follow-up of pioneering research to track fund flows for health research and development resources in the Philippines through primary and secondary data pertaining to the calendar year 1996. Using the methodology and learning of this earlier project, this study continues the analysis of fund flows for health research in the Philippines for the years 1997 and 1998. The study also looks into the priority setting process for health research in the Philippines. The data of the study is presented in this report. Recommendations are made for an improved measurement of health R&D flows, a coordinating mechanism for matching funds with priorities and for sustained monitoring.

- 4.12 COHRED. 2000. *The Flow of Philippine Funds for Health Research and Development*. Learning Brief No 2000.7, Geneva: Council on Health Research for Development, Pages: 2.

This learning brief provides a summary and presents the major conclusions of the Philippine component of a multi-country study on the flow of funds for health research and development. This also involved Malaysia and Thailand.

5.0 An alternate comparative analysis of three priority setting approaches.*

Characteristics	Essential National Health Research Approach	Ad Hoc Committee on Health Research Approach	Global Forum for Health Research “Combined Approach”
1. Objective of priority setting	Promote health and development on the basis of equity. Help decision-makers make rational choices in investment decisions.	Help decision-makers make rational choices in investment decisions so as to have the greatest reduction in the burden of disease for a given investment (as measured by number of DALYs *** averted).	Help decision-makers make rational choices in investment decisions so as to have the greatest reduction in the burden of disease for a given investment (as measured by number of DALYs averted), on the basis of the practical framework for priority setting in health research.
2. Focus at the global or national level?	Focus on situation analysis at country level; residual problems to be studied at global level.	Focus on situation analysis at the global level; method also applicable at the country level.	Method applicable at both global and national level.
3. Strategies/ principles	<p>Priorities set by all stakeholders.</p> <p>Process for priority setting should be iterative and transparent.</p> <p>Approach should be multidisciplinary.</p>	<p>Five- step process.</p> <p>Process should be transparent.</p>	<p>Priorities should be set by all stakeholders.</p> <p>Transparent and iterative process.</p> <p>Approach should be multidisciplinary (biomedical sciences, public health, economics, environmental sciences, education sciences, social and behavioural sciences).</p>
4. Criteria for priority setting **			
<i>Burden of disease</i>	Based on an estimate of severity and prevalence of disease.	Measured by DALYs	Measured by DALYs or other appropriate indicators.

Characteristics	Essential National Health Research Approach	Ad Hoc Committee on Health Research Approach	Global Forum for Health Research “Combined Approach”
<i>Analysis of determinants of disease burden</i>	Analysis of multidisciplinary determinants (biomedical, economic, social, behavioural, etc.)	Analysis of mostly biomedical determinants. Other determinants implicit.	Analysis of determinants at following intervention levels: - individual/family/community - health ministry + research - sectors other than health - government macro-economic policies.
<i>Cost-effectiveness of interventions (resulting from planned research)</i>	Some attempts at measurement in terms of impact on severity and/or prevalence.	Cost-effectiveness measured in terms of DALYs saved for a given cost.	Cost-effectiveness measured in terms of DALYs saved for a given cost.
<i>Effect on equity and social justice</i>	Central criterion in ENHR approach (not directly measured).	In-built equity orientation, based on same weights given to year of healthy life saved for poor and rich population (effect on equity not directly measured as yet).	In-built equity orientation, based on same weights given to year of healthy life saved for poor and rich population (effect on equity not directly measured as yet).
<i>Ethical, political, social, cultural acceptability</i>	This criterion is present, although in varying degrees, in various approaches, either explicitly (particularly in the ENHR approach) or implicitly.		
<i>Probability of finding a solution</i>	Specifically mentioned in the ENHR approach.	Part of the cost-effectiveness analysis.	Part of the cost-effectiveness analysis.
<i>Scientific quality of research proposed</i>	Pre-condition in all approaches.		
<i>Feasibility (availability of manpower, funding, facilities)</i>	Specifically mentioned in the ENHR approach.	Implicit.	Feasibility is part of the list of criteria.
<i>Contribution to capacity strengthening</i>	Explicitly mentioned in the ENHR approach.	Not mentioned. Could be integrated in the cost-effectiveness analysis	Can be integrated in the cost-effectiveness analysis

Characteristics	Essential National Health Research Approach	Ad Hoc Committee on Health Research Approach	Global Forum for Health Research “Combined Approach”
5. Critical problems and priority research areas	Will depend on each country’s situation.	<p>Infectious diseases, malnutrition and poor maternal/child health.</p> <p>New and re-emerging infectious diseases due to antimicrobial resistance (TB, STD, HIV/AIDS, malaria)</p> <p>Increase in NCD and injuries.</p> <p>Inequities and inefficiencies in delivery of health services.</p>	<p>Health system research (efficiency and equity of health systems).</p> <p>Child health and nutrition (diarrhoea, pneumonia, HIV, malaria, vaccine-preventable diseases, nutritional deficiencies, TB).</p> <p>Maternal and reproductive health (mortality, STDs, and HIV, nutrition, family planning).</p> <p>Non-communicable diseases (cardiovascular, mental and neurological conditions).</p> <p>Injuries.</p>
6. Implementation tools	Essential national health research plans.	<p>Forum for investors in international health research.</p> <p>National agendas.</p> <p>Public/private collaboration.</p>	<p>Analytical work for priority setting.</p> <p>Research networks (initiatives) for priority diseases.</p> <p>Annual meeting of partners to help correct the 10/90 gap.</p>

* Table modified from the 10/90 Report 2001-2002 (Insert 4.1)

** The criteria for priority setting listed are those proposed in all three approaches.

*** DALYs= number of years of healthy life lost to each disease.

Case Studies

Case Study 1: National Health Research Priority Setting in the Philippines (ENHR)

This country example illustrates the iterative character of the priority setting process (1992 & 1999). The national process of priority setting was explicitly based on regional consultations and documents how the results of these consultations can have an impact on national research planning and implementation. It is a good example of involvement of all stakeholders at the different stages of the priority setting process.

This country example is extensively documented in the following:

Philippine Council for Health Research and Development, Department of Science and Technology, Philippines, 1999. *Proceedings of the 5th National Health S&T Congress*. Pages: 126.

Philippine Council for Health Research and Development, Department of Science and Technology, Philippines, 1999. *Draft National Health S&T Priorities 1999-2004*. Pages: 49.

These documents can be obtained from the COHRED secretariat.

Case Study 2: Priority Interventions for the Major Microbial Threats (Ad Hoc Committee)

This example illustrates the level of generality of the Ad Hoc Committee approach and the type of research it promotes.

Table 4.10 Summary of priority interventions for the major microbial threats
(Source: Ad Hoc Committee (Ad Hoc Committee on Health Research Relating to Future Intervention Options). 1996. Investing in Health Research and Development. Geneva: World Health Organization. TDR/Gen/96.1)

Disease	Rank order among 96 causes of disease burden	Broad research direction needed towards 2020 to avert current and project burden	Desired intervention(s) with high expected cost-effectiveness
Tuberculosis	7	++ New tools +++ Improve efficiency of existing interventions	New prophylactic interventions improved formulation of short-course therapy for TB
Pneumococcus	1 (all ARI)	++ New tools +++ Improve efficiency of existing interventions	Trials of conjugate vaccines
Sexually transmitted diseases including HIV	Each now below 25, but HIV rising to 10 by 2020	+++ New tools + Improve efficiency of existing interventions for STDs other than HIV	HIV vaccine; vaginal microbicides; diagnostics
Malaria	11	+++ New tools + Improve efficiency of existing interventions	Vaccine, new first-line antimalarials

Note: The estimated rating ranges from little importance ('+') to extremely important ('++++')