World Report on Knowledge for Better Health

Strengthening Health Systems

Summary

The complete text of *World Report on Knowledge for Better Health—Strengthening Health Systems*, including all references, tables, figures and boxes, is available at www.who.int/rpc/wr2004. The web site includes sources for the quotations and "Interesting numbers" featured at the beginning of each chapter. Readers will also find a list of the many people who contributed to the report, a detailed account of how the report was developed, a glossary of terms, and links to additional background documents. Ordering information for a hard copy of the report is also provided.

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Executive Summary

Science has led to dramatic improvements in health worldwide. Yet all is not well. Disparities and inequities in health remain major development challenges in the new millennium, and malfunctioning health systems are at the heart of the problem. Half of the world's deaths could be prevented with simple and cost-effective interventions. But not enough is known about how to make these more widely available to the people who need them.

Knowledge for Better Health reviews the current state of global health research and concludes that:

- Much more investment is needed for a new, innovative approach to research on health systems.
- Health research must be managed more effectively if it is to help strengthen health systems and build public confidence in science.
- Stronger emphasis should be placed on translating knowledge into action to improve public health by bridging the gap between what is known and what is actually being done.

The main points made by the report are summarized as follows:

1. Science must help to improve health systems. It should not focus solely on advancing academic knowledge or confine itself to producing drugs, diagnostics, vaccines and medical devices.
2. Biomedical discoveries cannot improve people's health without research to find out how to apply them specifically within different health systems, population groups, and diverse political and social contexts.
3. Health systems must interact closely with health research systems to generate and use relevant knowledge for their own improvement. A culture of mutual learning, problem solving and innovation should be the basis of this relationship.
4. Every country should have a national health research system that focuses its energies on health problems of national interest, especially those which will strengthen health systems. Each health research system should have strong leadership and effective management to enable it to allocate resources efficiently and fairly, sustain human and institutional capacities, generate and use knowledge, and create an environment in which research can flourish.

5. All countries should be able to participate in global health research. Such research should be conducted efficiently, equitably, ethically and with strong public support and participation.

6. Equitable access to both published and unpublished research information is a priority. Such information should be shared with a range of stakeholders in an appropriate format. In particular, an environment should be created where the users of research can access and find relevant knowledge to inform their decisions. The main users of research are policy-makers, health professionals, researchers, the public, civil society, patients, health system managers, and health insurers.

7. An environment conducive to evidence-informed health policy and practice should be created. To achieve this, the producers and users of health research should work more closely together to shape the research agenda and to ensure that research is used to improve health.

8. New research should build on existing knowledge and health decision-makers should use research syntheses to inform policy and practice. Failure to do so may result in serious consequences for consumers of health care and to the inefficient use of limited resources for health-care provision and research.

9. Health systems research suffers from a poor image and has been underfunded compared to biomedical research despite widespread recognition of its importance. Key priorities in this area should be identified. More funds are needed to develop new methodologies and innovations to deal with the changing environment within which health systems currently operate.

10. The culture and practice of health research should reach beyond academic institutions and laboratories to involve health service providers, policy-makers, the public and civil society more. The public and civil society can lobby governments to accept change. In the developing world, any attempt to implement a public health programme without community support may fail.

11. To respond more effectively at the national and global level to today's public health challenges, health research must be reoriented to strengthen health systems through more effective management, by attracting more investments for more innovative research on health systems, and by translating knowledge into action to improve public health.

12. The report recommends that certain aspects of health research systems need to be managed more closely to make even more progress, while building on past achievements of science and health research.

1

Learning to Improve Health

"If you think research is expensive, try disease."
(Mary Lasker)

"What we have today is not the lack of evidence, it's the lack of trust."
(Fareed Zakaria)

"Between the health care we have and the care we could have lies not just a gap, but a chasm."
(IOM Report, Crossing the Quality Chasm)

Key messages

- The application of knowledge from health research has underpinned many of the gains in health and economic development in countries all over the world. However, its impact on improving public health in the developing world has been less than expected.
- Global health is currently characterized by persistent inequities, health systems under severe pressure in parts of the developing world, and the growing realization that effective interventions are often not reaching people who need them most.
- Links between health systems and health research systems need to be strengthened to generate and use relevant knowledge.
- Gross inequities in the research process at both global and national levels, along with a fraying of public confidence in science, are manifestations of the global health research endeavour that requires immediate attention.

Interesting numbers

1,000/100,000	Maternal mortality to live births ratio in Kenya, where 41% of births were assisted by a skilled attendant. This compares to a ratio of 8/100,000 and 100% skilled attendance in Japan.
6 million	Number of annual childhood deaths in the developing world that can be prevented by applying simple, effective interventions.
500,000	Number of citations added to Medline every year.
6%	Mean frequency of research articles relevant to diseases of poverty in five leading medical journals.
1%	Africa's share of global Internet access; 95% of which is in South Africa.

- Health research should be developed and conducted according to universal ethical standards and principles with the realization that implementation in the developing world has to take into account local context, capacity and conditions.
- New research should build on existing knowledge and health-care decision-makers should use research syntheses to inform policy and practice. Failure to do so may result in serious consequences for consumers of health care and to inefficient use of limited resources for health-care provision and research. More research syntheses should be undertaken on health problems with the highest global burden.
- Both published and unpublished research and information should be accessible and shared with a range of potential decision-makers in an appropriate format. Research generated by developing countries needs to be published and properly indexed.
- Health research should be reoriented to strengthen health systems through better management and more investments in health systems research.

1.1 The problem: current state of global health

Remarkable achievements but persisting inequities

The right to health is set forth in international human rights treaties and the World Health Organization Constitution as the right to the "highest attainable standard of health". This right was reiterated in the Alma-Ata declaration, which was drafted in 1978 at the International Conference on Primary Health Care in the former USSR. Today, the goals of Alma-Ata seem even more distant than they were a quarter of a century ago. Deep economic inequalities and social injustices continue to deny good health to many and persist as obstacles to continued health gains worldwide. There is also great variation in the pace and level of health achievements both between and within countries around the world.

Looking forward, there is a risk that inequities will become worse, not better. Rapid progress in biomedical sciences, for example, is threatening to widen the equity gap. A WHO report on genomics and world health, which was published in 2002, expressed concern about the risk that genetic research will exacerbate global health inequalities by creating a "genomics divide". Will the designer drugs of the future and other benefits that result from market-driven genomics research be unavailable to all but the wealthy few?

Interventions not reaching those in need

The burden of disease has been reduced, quality of life improved and life expectancy increased. But as impressive as the achievements of health research have been, they are not reflected in the current state of global health. While one fifth of the world's population enjoys an average life expectancy approach-

ing 80 years of age and a life comparatively free of disability, two thirds of the world's population living in the least well-off countries of Africa, Asia and Latin America suffer overwhelmingly from the world's burden of illness and premature death. Each year an estimated 15 million children—40,000 children per day—die from infection or malnutrition. Average life expectancy has dropped below 40 in some African countries because of HIV/AIDS. The toll of preventable and curable illness, early death and lifelong disability in developing countries from both communicable and noncommunicable diseases is unjust, immoral and a critical impediment to economic development and social stability.

Appropriate and effective biomedical interventions such as diagnostic tests, drugs and vaccines have led to enormous opportunities to improve health for all in the last 50 years (see Figure 1.1). So too have environmental and socio-behavioural interventions and prevention strategies. Many argue that the knowledge already exists to save lives and improve the health of millions of people around the world. But this is not entirely true: the knowledge that an intervention works is only half the equation of improved health. What is standing in the way of improved health is the knowledge about how to effectively implement and use the intervention. What is needed to improve coverage is a robust research agenda to explain factors that affect delivery of interventions in differing epidemiological, cultural and health systems contexts. A health system, therefore, is much more than a vehicle to deliver the products of research; it also comprises a wealth of knowledge that needs to be tapped in order to complete the other half of the equation.

Health systems under severe pressure

In an attempt to improve the state of global health, programmes and initiatives have been launched to better diagnose, treat, control or even eradicate diseases and other health problems. Principal among these are the Millennium Development Goals (MDGs), three of which are directly health-related: reduce child mortality, improve maternal health, and combat HIV/AIDS, malaria and other diseases. There are concerns, however, that these MDGs may not be achieved for most of the world's population by 2015. Analyses of the reasons for such unsatisfactory progress suggest the existence of system-wide barriers and formidable challenges in implementation and scaling up because of weak health systems.

And if resource-poor health systems are having difficulty dealing with current challenges, how are they to cope with the relentless march towards noncommunicable diseases? WHO estimates that by 2020, noncommunicable diseases will account for about two thirds of the global disease burden. In the absence of an adequate health system, how will people receive the long-term care they require? How can the impact of noncommunicable diseases be reduced if appropriate and culturally relevant programmes aimed at primary prevention, early diagnosis and secondary prevention are not designed and implemented?

Figure 1.1 Health research can save lives

(a) Improvement following insulin therapy

Mother with her child, almost in the terminal stages of diabetes (left) and the same child shovelling snow 32 days after insulin treatment had been started (right).

Source: Wrenshall G A, Hetenyi G, Feasby W R and Marcus A. *The Story of Insulin*. The Bodley Head Ltd., London, 1962.

(b) Improvement following antiretroviral therapy

Joseph Jeune and his mother, March 2003 (left) and January 2004 (right).

Photo: David Walton / © 2003 Partners In Health (Boston, USA). All Rights Reserved.

To rise to the challenge, health systems and health research systems together should move into a learning and problem-solving mode, integrate innovation into their operations, and better manage opportunities for growth and development. There are no quick fixes, no simple solutions and much remains to be learnt. New methodologies are needed to study health systems; new structures and means to translate knowledge into effective interventions should be identified; new tools and delivery strategies that achieve effective and sustained coverage in diverse cultural and economic settings are needed. Up-to-date and reliable basic health information is essential. Strengthening health

systems will require new forms of interactions between researchers, funders, policy-makers, health service providers, patients and civil society, and a long-term commitment, political will and support from all WHO Member States.

1.2 Health systems and health research systems

Health systems and health research systems should ideally be mutually dependent. On the one hand, a well-functioning health system is critical to the development and delivery of interventions that affect public health and health outcomes. On the other hand, a strong health research system is important for an effective and efficient health system. Both systems are equally complex and chaotic, which makes them challenging to manage and difficult to describe. What follows are working definitions of these two key entities to facilitate attempts to manage and steer them towards the ultimate objective of improving health outcomes.

What is a health system?

A health system includes all actors, organizations, institutions and resources whose primary purpose is to improve health. In most countries a health system has public, private, traditional and informal sectors. Although the defining goal of a health system is to improve health, other intrinsic goals are to be responsive to the population it serves. This responsiveness is determined by the way and the environment in which people are treated, and should ensure that the financial burden of paying for health is fairly distributed. Four key functions determine the way inputs are transformed into outcomes that people value: resource generation, financing, service provision and stewardship. The effectiveness, efficiency and equity of national health systems are critical determinants of population health status.

What is a health research system?

A health research system can be broadly defined as the people, institutions, and activities whose primary purpose is to generate and apply high-quality knowledge that can be used to promote, restore and/or maintain the health status of populations. It should also include mechanisms to encourage the utilization of research. The main goals of a health research system are the production of scientifically validated research and the promotion of the use of research results, ultimately to improve health and health equity. Such knowledge need not come from original research only. It may be the result of adapting existing knowledge to local conditions, of conducting research syntheses, or of generating the evidence-base for public health interventions. The traditional approach of using research to develop drugs, vaccines, devices and other applications to improve health is well recognized. But the need to synthesize and communicate the results of relevant research to policy-makers, health-care providers and the public is less appreciated.

How do the health system and health research system interact?

A health research system exists at the intersection of two larger, complex systems: the health system and the broader research system (see Figure 1.2). This subset of the two systems captures the production of health-related knowledge which, when used appropriately, can contribute to improvement in health status. There are clearly areas of overlap with other systems as well as interactions with international research activities and with the overall socio-political and economic environment, which can greatly affect the transition from research to policy and practice. These various links are strongly dependent on how effectively a health system utilizes health research.

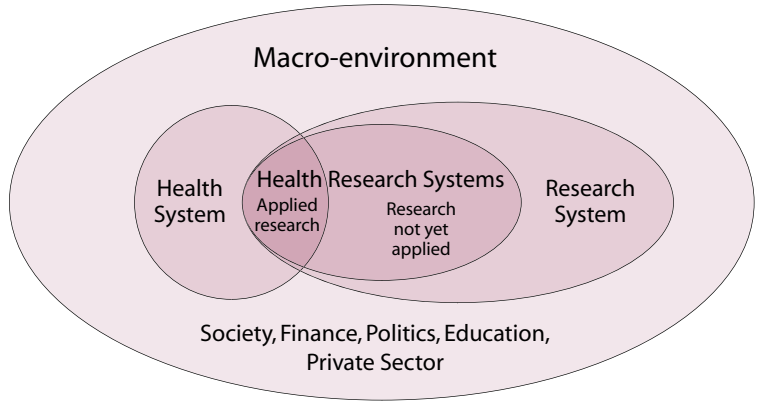
1.3 Taking stock of health research

Erosion of public trust and engagement in science and research

Mutual trust between government officials, health experts, the public and the media is needed in order to advance the cause of global health, science and research. In her hard-hitting book *Betrayal of Trust* Laurie Garrett writes: "Over the last 20 years trust has frayed and our global public health system has been systematically destroyed. The impact has been felt by average citizens, as a blow to both their personal health and their pocket books". This broken trust has to be restored.

Given the importance of linking health research and its application to public health, representatives of civil society should participate in setting the research agenda, in major health policy decisions, and in the design, implementation and evaluation of pubic health programmes. But such cooperation between funders, the research community and civil society is the exception rather than the rule. For example, public concern and consternation over HIV

Figure 1.2 Linkages between the health, health research and research systems and the broader macro-environment



Source: Adapted from Pang T et al. Knowledge for better health—a conceptual framework and foundation for health research systems. *Bulletin of the World Health Organization*, 2003, 81:815–830.

treatment trials in developing countries contributed to the development of initiatives to inject resources into global AIDS programmes, and to a global debate about drug patents, drug prices and access to medicine. This, in turn, led to important first steps to making antiretrovirals available to millions of people who could not afford them before.

So whether it is adversarial or in the spirit of cooperation, public involvement can reap positive, beneficial changes that research alone can not accomplish. As the case of AIDS and antiretrovirals suggest, relevant knowledge generated from research is necessary but not sufficient to tackle difficult and complex problems. Involvement of civil society and political commitment are also necessary. "The triangle that moves the mountain" is a concept developed by Thailand's Professor Prawase Wasi to represent the idea that addressing complex problems requires not only researchers. They must work together with policy-makers, politicians, the media, consumers and civil society towards a common goal and equally share power, influence and responsibility.

Inequities in the research process

Financing health research

An estimated 10% of the more than US$70 billion spent annually on health research (within and between countries) by the public and private sectors is used for research into 90% of the world's health problems. This is known as the "10/90 gap".

Persistent inequities in setting the research agenda

Health research in developing countries is often the result of collaborative partnerships where the foreign donor agency or funder usually has more power in deciding the research agenda. This can skew research into areas that are not priority health problems for the local population.

Gender bias in health research

Clinical research has generally excluded female subjects from study populations because it is believed the menstrual cycle introduces a potentially confounding variable. Women are also excluded because of fears that experimental treatments or drugs may affect female fertility and expose fetuses to unknown risks. The consequences of assuming that research results based on studies only involving men are universally valid, without convincing evidence that they apply to women, may be harmful to women.

Inequities in knowledge publication

More than 90% of scientific publications in health are published by researchers in the developed world. There is widespread systematic bias in medical journals against diseases that dominate the least-developed regions of the world.

Divide in access to information

Researchers in rich countries enjoy relatively easy access to research information, but in resource poor environments, Internet access remains low and few

researchers or institutions can afford the high cost of journal subscriptions (print or electronic). The divide in access is exacerbated by the massive number of scientific articles on health published each year.

Research favours generating new knowledge over assimilating what is already known

Research to date has focused on the generation of new knowledge but has tended to neglect the role and contribution of existing knowledge. This neglect has led to inefficient use of limited resources for research and missed opportunities for achieving health gains. Science is meant to be cumulative. New research should ideally be interpreted within the context of an existing body of scientific knowledge. Research synthesis is the application of this principle in practice.

Systematic reviews have become the preferred method for assimilating and digesting research. By applying a rigorous and transparent methodology to research synthesis, systematic reviews reduce systematic error (bias) and random error (the play of chance) that bedevil the review process. They are increasingly being used to inform health-care decisions such as whether a particular health-care intervention should be used or not.

But despite their central role in a knowledge-based health system, and despite the skill and time they require, systematic reviews do not attract anywhere near the same level of academic recognition or public attention as primary (especially biomedical) research. As a result, the number of published systematic reviews is still relatively small, the coverage of different diseases and other aspects of health care is uneven, and few reviews are related to diseases with a high global burden.

Lack of openness and accountability impairs ability to draw conclusions from research

A clinical trial result may not be published because a company abandons its plans to bring the drug to market. Publication may not be pursued because the results are negative or neutral, or because the trial was stopped before completion. Whatever the reason, if study results are never made public, no knowledge is gained.

Information about a drug that does not demonstrate efficacy in a controlled trial or one that demonstrates significant hazards is important for those making health-care decisions. If scientific findings are not reported or published, there may be implications for compromising the health and safety of patients, and causing inefficient use of resources.

To ensure that systematic reviews and other kinds of research syntheses are unbiased, or at least that the potential for bias can be estimated, the possibility of all controlled trials being accessible on an international trial register needs serious consideration. Ethical health research principles demand timely and accurate reporting of research results to study participants, researchers and all potential users of research. It follows that human research undertaken with

the full knowledge that the study results may not be in the public domain can be considered unethical.

Unresolved issues surrounding the ethics of research in developing countries

While the fundamental principles of ethical health research, such as community participation, informed consent, and shared benefits and burdens remain sacrosanct, other issues, such as standards of care and prior agreements, merit greater debate. The problem is that the stringent application of certain criteria in international guidelines would effectively stop much-needed public-health and epidemiological research. Consider, for example, the issue of standards of care. Exactly what constitutes the standard of care is open to interpretation: it can be interpreted as the global standard of care, or the locally existing standard, or a general standard of care in the research setting, including aspects of sustainability. The key challenge is how to effectively manage the "global standard" and "local context" interface. This appears to be a universal issue in the ethics of research in developing countries and a process should be developed to help resolve these debates when they arise.

Reorienting health research to strengthen health systems

Health research should and can be reoriented to strengthen health systems. To this end, this section's review of the current state of global health research reveals three critical areas that need attention: more investment in new approaches to health systems research (see Chapter 2), better management of critical areas in the health research process (see Chapter 3), and translating knowledge into actions (see Chapter 4). Chapter 5 presents recommendations and an agenda for action at both the national and global level. The ultimate objective is to facilitate the development of a culture of learning, problem-solving and innovation to strengthen health systems, improve health outcomes and equity, and build public confidence in science and scientists.

2

Towards a Scientific Basis for Health Systems

"Health systems should nurture a stronger culture of learning and problem-solving to tackle the major health challenges of our times. This could be achieved through a greater understanding of how the diverse elements within a health system interact with each other, and by finding innovative ways to solve complex problems."

(Tim Evans)

Key messages

- Health systems in the developing world face major problems related to shortages, maldistribution and waste of financial, human, knowledge and other resources, in addition to coverage shortfalls. There is increasing recognition by major health initiatives that many of their efforts to improve health share the same common health system constraints.
- Despite acknowledgement of its importance and potential to overcome health system constraints, health systems research suffers from a poor image and has been neglected and under-funded compared to other areas of health research.
- Key research issues and knowledge gaps pertaining to human resources, financing, health information and delivery of health services must be addressed in the context of more emphasis on broader health systems strengthening.
- Based on a readiness to reach beyond traditional academic disciplines, innovations, new methodologies and better tools should be developed for health systems research.

Interesting numbers

1 million	Estimated number of additional health workers needed if the Millennium Development Goals are to be achieved in sub-Saharan Africa.
2%	Percentage of global health expenditure in Africa, which carries 25% of the global burden of disease. In contrast, 90% of global health spending is in developed countries with 20% of the world's population.
2%	Percentage of countries in WHO's Africa and South-East Asia regions that have complete coverage of death registration data, as opposed to 75% in the European region.
0.71%	Percentage of papers on the subject of health systems and health services research in the year 2000 based on a search of Medline.
0.1%	Percentage allocated to health systems research as a portion of total health expenditure in developing countries.

- A substantial programme to support development of a new paradigm for research to strengthen health systems is required in the near term if health systems are to perform more effectively and improve health outcomes.

2.1 What is health systems research?

A robust and sound research enterprise is critical in generating the knowledge needed to overcome the enormous challenges facing health systems today. This area of research is referred to as health systems research.

Health systems research is defined as the generation and utilization of new knowledge to improve the way societies achieve their health goals. This may include the way they plan, manage and finance efforts to improve health, as well as involving and engaging all interested sectors of society. Health systems research is essentially research that investigates strategies for improving health service delivery, including the use of sound evidence in developing such strategies and in shaping effective health policy. It may be applied both within institutions, communities and at district or national level.

Box 2.1 gives an example of health systems research. In the context of health sector reform and decentralization in Tanzania, community-based participatory research conducted by the Tanzania Essential Health Interventions Project (TEHIP) resulted in a better match between disease burden and resource allocation at the district level.

Although health systems research cannot be expected to solve all of the problems facing health systems, it does have a central role to play. However, the priority research questions need to be identified and addressed in order to improve the knowledge base. Such topics may focus on noncommunicable diseases or on efforts underway to achieve the MDGs, but it is just as important to conduct research on the way a health system functions.

2.2 Bottlenecks and constraints in health systems

Table 2.1 lists the challenges and barriers to improving health service delivery identified in reviews of major initiatives that are attempting to make treatments for diseases like AIDS, tuberculosis and malaria—as well as vaccines and health information—more widely available. The table shows shortages of skilled health workers, lack of funds, shortages of medicines, inability to generate and use information, and inadequate public health information systems. Reviews of other programmes and initiatives dealing with noncommunicable diseases and injuries, for example, face similar systems constraints.

Chapter 2 of the main report elaborates on the major challenges in the areas of human resources, financing, health information, and health services delivery. Based on these health system constraints, the knowledge gaps and research priorities in key health system functions are described.

Box 2.1 How Tanzania is using research to reform its health system

The Tanzania Essential Health Interventions Project (TEHIP) was set up to find new ways to plan, set priorities and allocate resources as part of a major reform of the country's health-care system. Tanzanian researchers started research in 1997 in two of the country's 123 districts—Rufiji and Morogoro—as part of the project run by the Ministry of Health and Canada's International Development Research Centre. Latest data from a five-year follow-up of the project indicate a 54% reduction in infant mortality, a 47% reduction in under-five mortality and a 18% reduction in adult mortality.

The research project is focused on health systems, health behaviours, health impacts, and the research and development of planning tools. The initial aim was to evaluate the overall impact of health interventions in terms of burdens of disease and per capita cost. For example, the researchers found that in both Rufiji and Morogoro districts, malaria alone accounted for 30% of all healthy years of life lost due to deaths in 1996–1997. In response, government planners increased the budget for malaria prevention and treatment programmes from just 10% to 26% by 2000–2001 (see figure). The research also showed that children under five carried more than 60% of the total burden of disease in both districts, compared with 37% for adults.

Overall, the research has resulted in a better match between disease burden and health budget allocation (see figure). It also helped to develop tools to help district health management teams collect and analyse information, improve health service delivery, set priorities and allocate resources accordingly.

Burden of Disease Profiles draw from sentinel demographic surveillance areas to show health needs at the community level. District Health Accounts map district health budgets and expenditures in relation to the burden of disease and other criteria. The third tool, the Integrated Management Cascade, is a hierarchical communications and supervisory support structure that delegates responsibilities within the health system. The fourth is the Community Driven Facility Rehabilitation, which aims to improve health service delivery, community responsibility and involvement.

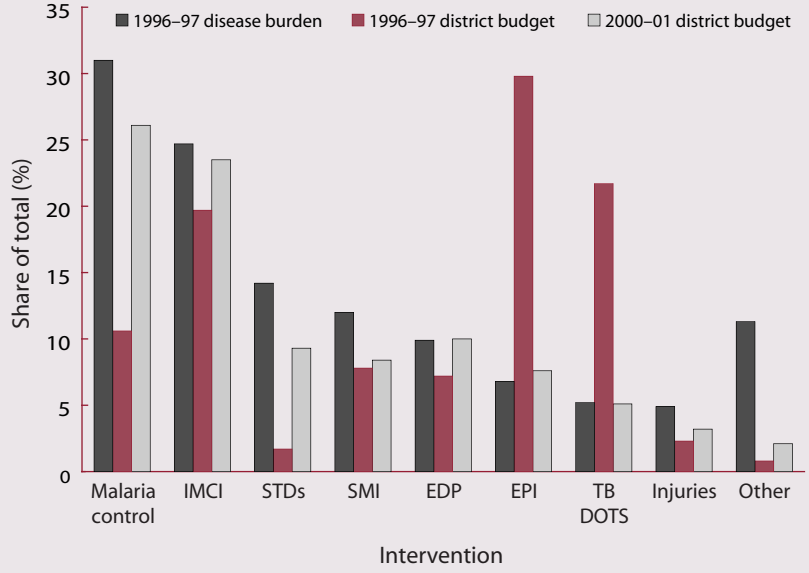
Using these four tools, Rufiji and Morogoro districts have addressed their burden of disease by investing in several essential health interventions, such as the Integrated Management of Childhood Illnesses strategy, insecticide-treated bednets and the Safe Motherhood Initiative. By redirecting health spending using TEHIP's tools, both districts have cut their child mortality rate by more than 40% since the late 1990s.

Tanzania has initiated similar per capita health funding in at least two thirds of the country through a new, sector-wide government-donor partnership. To promote this evidence-based approach to health-care funding, TEHIP has printed manuals in English and Swahili and developed training courses with the Ministry of Health.

The government has started to introduce the cascade method to other districts and is poised to do the same with the facility rehabilitation tool as well. It is training officials in districts to use the tools that can help match a region's burden of disease profile with a corresponding budget. The goal is to have all the districts using these tools to allocate resources according to health priorities by the 2005 planning cycle.

Fixing Health Systems, *published by the International Development Research Centre, Ottawa, Canada, in October 2004, and other resources on the project, are available at www.idrc.ca/tehip.*

A better match between budget allocation and disease burden: health expenditures in Morogoro district 1996–97 and 2000–01



Legend
IMCI: Integrated Management of Childhood Illness
STDs: Sexually Transmitted Diseases
SMI: Safe Motherhood Initiative
EDP: Essential Drug Programme
EPI: Extended Programme on Immunization
TB DOTS: Tuberculosis Directly Observed Treatment, Short Course Strategy

Table 2.1 Barriers and challenges to improving service delivery identified in reviews of major initiatives

	Maternal health	*Child health*	*TB*	*Malaria*	*HIV/AIDS*
Community and household level					
Demand-side barriers—individual: socioeconomic, gender effects on behaviour, access, use of care	✔	✔	✔	✔	✔
Demand-side barriers—community: absence of social pressures to improve access	✔		✔		✔
Stigma*	✔		✔		✔
Health services delivery					
Inequitable availability of services	✔	✔	✔	✔	✔
Multiple providers, public and private	✔	✔	✔	✔	✔
Provider behaviour to clients	✔	✔	✔	✔	✔
Case management: poor adherence, increasing drug resistance, adverse events	✔	✔	✔	✔	✔
Physical infrastructure, equipment	✔	✔	✔	✔	✔
Human resources availability and management, including payment mechanisms, quality of care, supervision	✔	✔	✔	✔	✔
Drug supplies, supply systems	✔	✔	✔	✔	✔
Service management capacity	✔	✔	✔	✔	✔
Referral and other communication failures	✔	✔	✔		
Health sector policy, strategic management					
High level political commitment to the specific problem or programme	✔	✔	✔		✔
Financial constraints, resource allocation	✔	✔	✔	✔	✔
Insufficient coordination between donors, non-governmental organisations, government bodies	✔	✔	✔	✔	✔
Regulation or legislation to affect both public and private actors	✔	✔	✔	✔	✔
Weak links between programmes leading to inefficiencies and competition for limited resources	✔	✔	✔	✔	
Sector-wide approaches, health-sector reforms	✔		✔		
Monitoring systems, use of information—public and private sector	✔	✔	✔	✔	✔
Public policies cutting across sectors					
Macroeconomic policies, poverty reduction strategies, civil service rules and reforms	✔	✔	✔		

TB = tuberculosis

✔ Indicates challenge or barrier faced by that health priority

* Although stigma is not always perceived as a health-system issue, it is included here because health systems can reduce or increase stigma, depending on the way people are treated by providers and perhaps the availability of effective treatment.

Source: Travis P et al. Overcoming health systems constraints to achieve the Millennium Development Goals, *Lancet*, 2004, 364:900–906.

2.3 Future challenges

New tools and methodologies needed

Few people appreciate how important it is to develop new tools and methodologies to tackle a given research problem or realize that new research can bridge gaps in current research. Part of the problem is that methodologies which were developed for other fields of research have been adopted in health systems research, even though they may be unsuitable or inappropriate. The answer does not lie in adapting or adopting these to the field of health systems research but rather in investing in innovative ways to study health systems. Some advances are already being made to create such new approaches.

Building capacity

All the above must be complemented by a strong effort to build capacity and effective institutions for health systems research to flourish. Capacity building efforts should pay close attention to the role of mentors and teachers in nurturing the next generation of health systems researchers. Within institutions, an environment should be created which would attract the best people by providing: attractive academic career structure, incentives (financial and otherwise), access to information, and opportunities to teach, do research, and participate in meetings and courses.

Raising the profile and sending a signal

There is an inherent tension in health systems research between the need for more fundamental work to develop better tools and more robust conceptual frameworks and the preferred focus on more local, context-specific, applied and community-based participatory research. Clearly, both types of research are needed and should complement each other. And although context-specific, local research may seem more relevant, attention should also be given to fundamental health systems research as it may disproportionately raise the profile of the field as a whole, thus sending a strong signal to the scientific community of a willingness to explore new vistas and novel ideas. At the same time as exploring these frontiers, however, health systems research must keep its feet firmly on the ground and interact more effectively with the broader health research system. This is the subject of Chapter 3.

3

Strengthening Health Research Systems

"Research is a system involving people, institutions and processes. Its pursuit depends on systematic analysis, creativity and exploration."
(Commission on Health Research for Development)

"The health research system is the brains of the health system: it is a tool to organize, understand, operate and improve it."
(Prawase Wasi)

Key messages

- Leadership, funding, researchers and institutions, and the capacity to utilize research findings are as important as new discoveries.
- National health research should focus on priority health problems in the country concerned, on health system challenges and on managing opportunities for future growth and development. International efforts should support strategic research opportunities in particular.
- Research agendas should be set up to succeed. This means adequate, sustainable and transparent funding, professional research managers, ethical standards, and accountability in the use of public funds.
- In addition to peer reviewed journal articles in large, international databases, other forms of research have potential value and should be recognized.
- Funds should also be invested in strengthening human and institutional research capacities to address complex health problems.

Interesting numbers

10%	Percentage of research outputs produced by health researchers surveyed in 13 low- and middle-income countries that were referenced in international databases of journal articles.
22,000	Estimated number of scientific journals in the world in 2002.
1/3	Proportion of researchers, policy-makers and other users of research in 13 low- and middle-income countries who said in a survey that there was either no rational process to set health research priorities in their countries, or that they were unaware of how priorities were identified or set.
20,000	Number of qualified professionals emigrating annually from Africa since 1990.
3%	Percentage of public sector funding from developing countries directed towards health research, as a proportion of total global spending on health research.

- Biomedical discoveries cannot improve people's health without research to find out how to apply these within different health systems, population groups, and diverse political and social contexts.
- The culture and practice of health research should be expanded beyond academic institutions and laboratories to include health service providers, policy-makers and civil society.

3.1 What is a system for health research and why is it important?

Most countries need to adopt a more comprehensive, better coordinated and participatory approach to health research in order to develop policies and strategies to better ensure that research produced attains its goal of improving health outcomes. This is the underlying premise of a "health research system".

While health research systems can operate at local, national, regional or global levels, this chapter focuses on national health research systems to highlight the importance of countries producing their own research and using existing research to identify and address their health problems.

The four main functions of a health research system are essential to attain the goals of knowledge for better health:

1. **stewardship**—strong leadership to direct, coordinate, manage and review health research;
2. **financing**—sustainable and transparent processes to mobilize and allocate funds for research;
3. **resources**—sufficient human and institutional capacities to produce and especially to use research;
4. **producing and using research**—producing research that addresses health challenges, synthesizing research results, and using the knowledge gained, particularly within health systems.

On a national scale, health research efforts are often hindered by insufficient coordination. Research activities in various health-related fields can be fragmented, isolated from each other and wastefully competitive. Moreover, there is often little communication and consultation between the producers of research and the users of research: policy-makers, health providers, civil society, the private sector, other researchers, and the general public.

Efforts to increase the quality, relevance and production of research need to also consider whether there is a demand for this research. A well-coordinated, systematic approach to health research that involves all stakeholders will help achieve this objective. As an example, Figure 3.1 lists the roles of the many key stakeholders within Malaysia's national health research system.

Countries need a health research system to identify priorities, mobilize

resources and maximize use of existing ones, develop and sustain the human and institutional capacity necessary to conduct research, disseminate research results to target audiences, apply research results in policy and practice, and evaluate the impact of research on health outcomes. More systematized approaches to these processes involved in the performance and production of health research would help to improve the transparency and accountability of health research activities.

The health research system and the health system cannot exist in separate worlds. The notion of "knowledge for better health" demands that the health research system should provide more direction to strengthen the health system. Health research can provide guidance on how to invest limited resources allocated to health systems more effectively. Health research must also investigate a broad range of issues in addition to life sciences or clinical medicine, such as:

- what makes us healthy or ill, including a broad range of social, environmental and economic determinants;

Figure 3.1 Key stakeholders within Malaysia's national health research system

Funders	Producers	Evaluators/Monitors	Users
National	Government Research Institutions	Ministry of Health	Ministry of Health
Ministry of Health	Public Universities	Ministry of Science, Technology & Environment	Health Service Providers (public and private)
Other Ministries	Private Universities	Universities	Ministries
International	Ministry of Health Departments	International Agencies	Universities
Pharmaceutical Companies	Industries	National Committee on Clinical Research	International
Industries	Corporatized Government Research Institutions	Government Research Institutions	Pharmaceutical Companies
Professional Organizations	Professional Organizations	Corporatized Government Research Institutions	Researchers
NGOs	NGOs	Foreign Research Institutions	NGOs
General Public	Foreign Research Institutions	Private Medical Institutions	Professional Organizations
	Private Medical Institutions	Ethics Committees	General Public
			Media
			Industries

Source: Institute for Health Systems Research, Ministry of Health, Kuala Lumpur, Malaysia.

- how to prevent illness, accidents, injuries, and how to treat these more effectively and efficiently;
- how to be responsive to people's needs and expectations;
- how to provide services for all kinds of peoples, groups and sub-populations, particularly those who have been chronically underserved or simply not covered at all;
- how to take into account that individuals live and experience health and illness within households, communities and social networks;
- how to organize health services given the existence of different administrative, geographic and political levels;
- how to obtain accurate and reliable basic health information;
- how to set health priorities and goals and develop strategies to implement them;
- how to train an appropriate mix of health professionals and health workers;
- how to finance the health system in an equitable and sustainable manner;
- how to mix preventive and curative services, private and public services, disease specific services and more comprehensive services;
- how to link the health research system with the non-health public and private sectors;
- how to involve people and institutions in the process;
- how to evaluate health systems.

These questions may not be exhaustive, but they are relevant to all countries and all health systems. All countries, especially those with relatively limited resources, need evidence and knowledge to shape health policy. Research on health systems, the topic of Chapter 2, should be viewed as an investment and not a cost.

3.2 Finding the right balance

In terms of the production and use of research, a global health research system has to attempt to find a balance between three areas: (1) producing scientifically valid fundamental research outputs; (2) promoting the use of research to develop drugs, vaccines, devices and other applications to improve health; (3) translating, synthesizing and communicating research to inform health policy, health practice and public opinion. In most countries much of the focus is on the first, with some on the second, and almost none on the third. Articles addressing public health remain a low proportion of papers published in peer

reviewed journals that are shared in international databases. Moreover, less than one tenth of the Cochrane Collaboration's reviews are on public health interventions.

In addition, the research base addressing diseases that have the greatest burden is extremely thin. Systematic reviews are impossible if there are not enough articles to be synthesized. Moreover, with so few studies addressing interventions for populations in greatest need, it is difficult to develop evidence-based policies.

3.3 What else is needed to improve health research systems?

In the main report, Chapter 3 outlines the framework for a health research system and a set of concepts to help map out the key functions and areas for policy-making. These four functions are then elaborated on in separate sections which suggest various ways they could be developed and strengthened. But in order to improve health research systems, other areas that cut across all four functions also need attention.

Each country's national health research system varies in terms of its unique mix of different sectors, organizations, legal and regulatory frameworks, degree of decentralization, social values, historical context, health challenges, among other characteristics and processes. This report proposes that the overall goals of a health research system are to produce and use knowledge for better health. But more specific national goals, policies and strategies are also needed to complement this overarching system goal, taking into account sub-national as well as the regional and international context.

Addressing the need to understand and share experiences on health research systems

Benchmarking of national health research systems may provide one way to complement but not replace qualitative and other contextualized analyses. In general, international and regional benchmarking efforts assume that data and information from a range of countries point toward a new understanding of shared problems; toward new solutions to those problems; or to new mechanisms for implementing policy and improving performance, including cooperation across countries. Benchmarks are entry points to interpret and discuss the examples from around the world and often provide invaluable evidence of what works in practice. They can also help avoid either re-inventing the wheel or repeating others' mistakes. Policy- and decision-makers can also learn from the ways in which other governments undertake the process of policy-making itself despite differences in contexts.

A better understanding of national health research systems is one means towards recognizing the challenges and developing policies that improve the functioning of a national health research system. Part of this improvement requires that the health research system's various functions operate together to

achieve a common set of goals. The reality, however, is that in most countries, especially in low-income and many middle-income countries, data sources and organizational analyses on health research are limited. In such cases, existing reports and reviews do not provide a comprehensive view of health research as an input to strengthen the system. Even less attention is given to how to strengthen the links between the health research system and the health system to produce knowledge for better health.

The way forward

Benchmarking and broad stakeholder discussions are examples of important tools and processes that could help improve health research systems if used to improve and inform policies. They are a means to an end, rather than an end in themselves. Other examples of what is needed to inform the health research system include:

- analysing the ways in which different parts of the system interact;
- promoting better links with the broader research system and science and technology in general;
- improving interaction with private sector and civil society research;
- creating innovative models of organization, such as networks of centres of excellence;
- reducing corruption by improving transparency and accountability.

But even the best-organized health research system must ultimately use knowledge to deliver improved health outcomes. This is the subject of Chapter 4.

4

Linking Research to Action

"As studies have shown, evidence is rarely applied to decision-making in accordance with a rational linear model. In practice, evidence is often generated through doing—in the enactment of policy. Evidence may be only one component of any decision-making process, but it can be made an integral part of a culture of inquiry based on continual learning and development."
(David Hunter and Amanda Killoran)

"Knowledge is not a commodity—it does not flow down a gradient from researchers to decision-makers. Using a soccer metaphor, management of knowledge is not about keeping an eye on the ball but on the goal, and being sensitive to the nature and vagaries of the playing field. Knowledge is not the ball but what goes on between the players who share a belief and a common purpose—to score the goal."
(Ariel Pablos-Mendez)

Key messages

- Researchers and research organizations need the skills and resources to communicate with users in a more effective way. Funders could support this by making effective communication of relevant research results mandatory.
- An environment must be created where the users of research can access and find relevant research to inform their decisions. The main users of research are the public, civil society/NGOs, patients, medical staff, health system managers, health insurers, researchers, and policy-makers.

Interesting numbers

264 years	Time taken between James Lancaster's discovery that lemon juice prevented scurvy and the British Navy's decision to ensure an adequate supply of citrus fruits on navy ships.
30–40%	Percentage of patients in the USA and Europe who fail to receive cost-effective interventions justified by the best-available scientific evidence.
Doubled	Number of high-quality studies on complex health system interventions available after a systematic review included a search of the "grey" literature.
25%	Percentage of patients in some Asia-Pacific countries with unstable angina or a previous myocardial infarction taking beta-blockers despite strong evidence for the efficacy of this safe and cheap medication.
2–15%	Percentage of African children sleeping under bednets in 2001.

- The producers and users of health research should work more closely together to shape the research agenda and to ensure that research is used to improve health.
- Intermediaries, or knowledge "brokers", can build and nurture relationships between producers and users of research. The media can also help in this.
- Not enough is known about the effectiveness of health strategies in low-income countries, therefore, more investment is needed to evaluate their impact.
- Communities can be a powerful influence on governments to accept change, particularly in the developing world. Attempting to implement a health improvement programme without community support could result in failure.

4.1 Challenges and barriers to the use of research

Positive change does not automatically result from sound evidence alone, no matter how well synthesized or how effectively communicated. If it did depend only on this, no one would smoke, or over-eat or drink too much alcohol. Everyone would exercise regularly and always fasten their seat belts. Practitioners would follow guidelines and their patients would comply with prescribed treatment. Governments would ensure that key research findings were widely promoted, and used to develop policies and make funding decisions.

The failure to use effective interventions is a global problem. Studies have shown that up to half of the patients in the United States and Europe are not receiving care according to the best scientific evidence. A major study on child survival concluded that around 60% of the 10.8 million deaths among children in 42 low-income countries could be prevented by effective and affordable interventions. In 2001, it was estimated that only 2–15% of African children were sleeping under bed-nets. The other problem is that the use of ineffective or inefficient treatments may pose significant risk of harm to patients, place additional burdens on over-stretched health services and waste limited resources. The continued use of certain antimalarial drugs despite sound evidence of drug resistance is but one example. This is particularly devastating in low-income countries where most people pay for health care out of their own pockets.

The notion of "knowledge for better health", therefore, must go beyond the production and passive dissemination of research. National health research systems should:

- focus more attention on promoting the use of research and on designing research "strategically" to solve priority problems in health;
- acknowledge that the users of research also generate knowledge, albeit in

different ways, and that they should be closely involved in the research process;

- evaluate the different approaches to implementing research findings and interventions in health-care delivery, as well as promoting evidence-based practice. The ultimate goal is the strengthening of health systems.

This chapter examines the barriers that may prevent the use of knowledge and looks at what producers and users of research can do to improve the chances that evidence generated will be acted on. The main report also highlights the key role research should play in implementing and evaluating policies, programmes and interventions. Much of the research underpinning the approaches described in this chapter, however, was conducted in high-income countries and more research of this kind is needed in low- and middle-income countries.

There are significant challenges associated with bridging the gap between knowledge and action. Decision-making processes are complex. Knowledge, or evidence, is only one contributing factor to how policies are shaped, how health workers practise and how people make decisions concerning their health. Research knowledge must often compete with other factors including beliefs, intuition, habits, superstitions, traditions, past experiences, culture, personal interests and political considerations. Ultimately, however, scientific evidence should help to enlighten and complement the more cultural and personal beliefs and values people hold.

Table 4.1 lists some of the possible barriers to the use of research. The relative importance of each of these barriers varies between countries and among users depending on the nature of the research findings and the constraints facing a nation's health system.

4.2 How can researchers effectively communicate research results?

The producers of research such as scientists and the institutions where they work can facilitate the use of research knowledge by thinking carefully about what should be transferred, to whom, by whom, how, and with what effect. A five-step approach for more effective transfer of research results has been proposed:

- develop a message based on systematic reviews that can be acted upon;
- identify the most appropriate target audience;
- use credible messengers;
- use proven approaches to transferring the message;
- evaluate the impact of that message.

The message should be short and preferably in no more than a page tell a

Table 4.1 Potential barriers to uptake of evidence by health professionals

Barriers may exist in the:

Health care system

- Lack of financial resources
- Inappropriate financial incentives
- Inadequate human resources (quantity and quality)
- Lack of access to care
- Health policies that fail to promote cost-effective interventions or advocate unproven activities
- Failure to provide practitioners with access to appropriate information

Practice environment

- Limitations of time
- Poor practice organization, for example there may be a lack of disease registers or mechanisms to monitor repeat prescribing

Educational environment

- Failure of curricula to reflect research evidence
- Inappropriate continuing education and failure to link up with programmes to promote quality of care
- Lack of incentives to participate in effective educational activities
- Influence of commercial interests may bias educational activities

Social environment

- Influence of media may create inappropriate demands/beliefs
- Influence of social fads and trends
- Impact of disadvantage on patients' access to care, literacy and health behaviours

Political environment

- Ideological beliefs may be inconsistent with research evidence
- Political corruption
- Short-term thinking may dominate

Practitioner

- Obsolete knowledge
- Influence of opinion leaders may go against research evidence
- Beliefs and attitudes (for example, these may be related to previous adverse experience of innovation)

Patient

- Demands for ineffective care
- Perceptions or cultural beliefs about appropriate care

Source: Haines A et al. Bridging the implementation gap between knowledge and action for health. *Bulletin of the World Health Organization*, 2004, 82:724–732.

busy public policy-maker the four things he or she needs to know: 1) what is the issue from the perspective of a decision-maker? 2) what does the research evidence reveal? 3) does current decision-making differ from decision-making informed by this research evidence? and 4) who should act and what should be done?

The knowledge pyramid on the following page captures the relative balance that a health research system could seek to achieve.

Investments in developing "actionable" messages would be promoted if highly visible organizations required that trial results always be presented within a systematic review that puts the results in perspective, as for example the WHO's Department of Reproductive Health and Research has mandated for the research the department funds or produces.

Role of knowledge brokers

But crafting appropriate messages and delivering them to various target audiences is time-consuming and costly, and requires a different set of skills to those needed to conduct research. Most researchers are either ill-equipped to do this on their own or have little interest in doing so. This vital task is often best left to professional medical writers, communicators, and intermediaries or "brokers" whose job is to translate and disseminate research findings in an accessible form that can be used by policy-makers and others. Developing countries need to invest more resources to build up these communication skills.

4.3 Strengthening the use of evidence in decision-making

The main users of research are the general public, patients, communities, health-care workers, health system and NGO managers, policy-makers and the scientific community. This section focuses primarily on public policy-makers and health system managers. They can be more effectively supported to use research knowledge in their decision-making in three ways:

- by developing their or their representatives' capacity to use research knowledge;
- by commissioning research or research syntheses when none exist;
- by combining research knowledge with other types of knowledge to bring about change in health systems to achieve health equity.

Firstly, using research requires having the capacity to access the relevant knowledge. Critical appraisal skills and tools are also required to assess the quality of the research or, as is more likely to be the case, to identify high-quality research that has been appraised by others. Often, the research must be adapted to local conditions.

Secondly, when gaps are identified in existing information, policy-makers must be supported by the health research system to fill the gaps. This

can be done, for example, by commissioning research studies or syntheses. Another area where gaps might exist is policy-making outside the health sector when there is limited information about social determinants of health, like poverty.

Thirdly, knowledge in several areas must be combined to bring about change in health systems. More specifically, the types of knowledge needed are as follows:

- knowledge about priority problems (e.g. most burdensome diseases);
- knowledge about proven solutions for priority problems (e.g. cost-effective prevention and treatment options for a particular disease profile in a country);
- knowledge about the context for change and whether solutions are likely to work in the local setting (e.g. local interpretation of problems and local capacity to employ particular solutions, where capacity includes human resources, infrastructure, and money);
- knowledge about proven mechanisms to bring about change (e.g. including incentives and building support among the health workforce).

Many of the methods outlined above are also relevant for other users of research besides policy-makers. Over the past decade or so researchers in North America and Europe have been working on developing more effective methods to promote professional behaviour change. Although to date almost all the trials have been conducted in high-income countries, in the developing world, groups like the International Clinical Epidemiology Network (INCLEN) are actively working in this area.

Even less is known about how to assist patients and the public in middle- and low-income countries to use evidence to inform their health-care decisions. What are their health information needs? What are their priority health issues? The recently formed Global Equity Gauge Alliance is one group attempting to address this gap. It is convinced that community voices must be heard and become part of any strategy to move research to action to improve health and reduce health inequities.

Beyond just hearing community voices, encouraging the use of existing knowledge to improve health depends on acquiring knowledge about how health and illness is regarded in any given community. Two examples are given. Box 4.1 gives an example from Nepal of a rigorously designed study which found that a community-based intervention involving women's groups significantly reduced neonatal mortality. In Bangladesh, a major NGO called BRAC launched a nationwide health campaign to teach mothers in rural areas how to prepare and administer oral rehydration therapy (ORT), a simple solution of water, sugar and salt, for use against diarrhoeal disease (see Figure 4.1). ORT has contributed to a significant decline in infant morbidity and mortality in

Bangladesh and elsewhere. It was once described by the *Lancet* as "potentially the most important medical advance of this century".

4.4 Bringing together the producers and users of research

Much attention has therefore been focused recently on the idea of creating a more "research-attuned" culture among the users of research and a more "decision-relevant" culture among producers of research by investing in long-term knowledge exchange relationships. Knowledge exchange models have two primary goals: to promote collaborative research and agenda setting, and to promote the application of research to policy and practice. The idea is that

Box 4.1 Community participation in health research: an example from Nepal

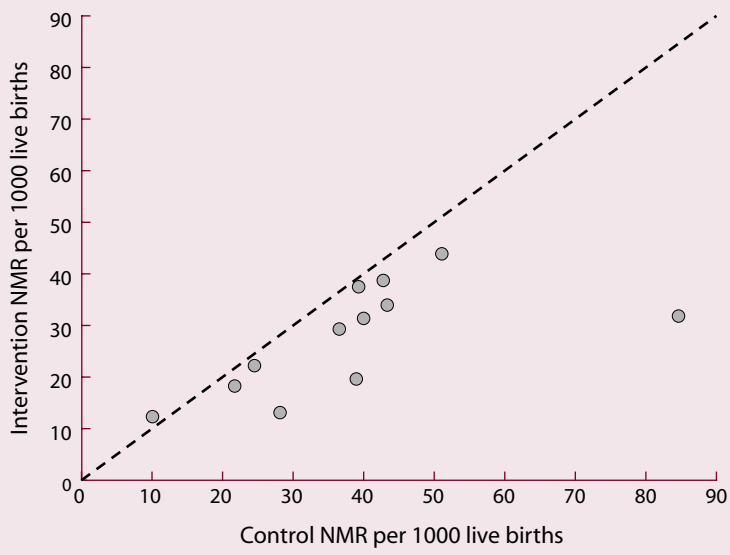
Neonatal deaths in poor rural populations can be reduced significantly by simple, cost-effective measures involving women's groups in local communities, a recently published study conducted in Nepal has shown.

Neonatal deaths are a major public health concern in much of the developing world. Of the four million neonatal deaths which are reported every year, 98% occur in developing countries. In India, for example, 70% of infant mortality is due to babies dying in the neonatal period of their lives. In Nepal, 90% of deliveries in the poorest households occur at home. Logically, community participation would seem to be an effective approach to reduce neonatal mortality in this resource-poor setting.

Based on a randomized controlled trial design, the study involved 12 cluster pairs: one was the intervention arm and the other the control arm. Village development committees and women's groups in villages were closely involved in the study's design and implementation. A facilitator worked with the women's groups in monthly meetings using innovative participatory learning strategies. The researchers took an "action-learning" approach where local perinatal problems were identified and strategies collectively formulated, implemented and assessed.

During the trial, which was conducted from 2001 to 2003, there was a significant reduction in the neonatal mortality rate in 11 out of the 12 intervention clusters compared with that of the control groups (see figure). The rate in the intervention group was nearly 30% lower than in the control groups. In addition, the maternal mortality ratio was 69 per 100,000 in the intervention clusters compared to 341 per 100,000 in the control clusters. Women in the intervention group were also more likely to seek antenatal care and give birth in a hygienic institutional setting with the assistance of a trained birth attendant compared to the control group. The study illustrates the importance of community participation in health research. Moreover, this is an intervention which is potentially sustainable, scalable and transferable to other developing countries.

Neonatal mortality rates in intervention and control cluster pairs



NMR=neonatal mortality rate. Dotted line is line of equality

Source: Manandhar DS et al. Effect of a participatory intervention with women's groups on birth outcomes in Nepal: cluster-randomised controlled trial. *Lancet*, 2004, 364:970–979.

Figure 4.1 Simple solutions: treating diarrhoea in Bangladesh

(a) A mother in a Bangladesh village preparing a lobon-gur (salt-local brown sugar) solution under the watchful eyes of a trained health worker.

(b) A child with diarrhoea drinks the lobon-gur solution.

Source: Chowdhury AMR, Cash R. *A simple solution-teaching millions to treat diarrhoea at home*. Dhaka, University Press Limited, 1996.

the way to close the gap between evidence and clinical practice is by working in partnerships with consumers, health professionals, organizations, researchers and policy-makers. Facilitating interactions between these various groups should increase the use of research findings and lead to research agendas that more accurately reflect the priorities of the users of research.

These relationships can involve assuming shared responsibility for setting research priorities and participating in the research process from idea generation through data interpretation. It may also involve participating in the transfer and facilitation of the use of research knowledge, and in formulating, implementing and evaluating the impact of policies. The relationships can also involve the development of a greater awareness of the incentives and constraints operating in each other's worlds, the development of mutual respect for the knowledge that different people bring to the table, and the development of jointly "owned" knowledge about how to improve health systems and achieve health equity.

Long-term relationships involving the producers and users of research should enhance the relevance and applicability of any research produced and increase the chance that research will be acted upon. That said, knowledge exchange is the new "frontier" of bringing research to policy and practice, and this new approach warrants more attention and evaluation.

Observatories, which act as a convenor, middleman or "broker", are one way to bring together the producers and users of research. These intermediaries can build and nurture relationships among individuals both within and among organizations with different types of knowledge.

5

Recommendations and Action Plan

"Now is the time to make it happen where it matters, by turning scientific knowledge into effective action for people's health."
(Jong-Wook Lee)

"Knowing is not enough, we must apply;
willing is not enough, we must act."
(Johann Wolfgang von Goethe)

5.1 Recommendations

Knowledge for Better Health reaffirms the view that the generation and application of high-quality knowledge is vital to a high performance health system and the socioeconomic development of any given country.

In order for national health research systems to effectively utilize knowledge to improve the performance of health systems, they should:

- be based on the principles of ethical practice and transparency, and focused on achieving health equity;
- be able to obtain and sustain public trust, confidence and support;
- be able to access and communicate reliable and relevant evidence, knowledge and information;
- be adequately financed and supported by strong and sustainable human and institutional capacities;
- be closely tied to the national health system, and be able to set research priorities and influence the research agenda;
- be strongly focused on narrowing the gap between what is possible to do and what is actually done, and on developing a culture where decisions taken by policy-makers, health professionals and the public are informed by evidence.

- be able to integrate learning, problem-solving and innovation within the system;
- be linked with and contribute to regional and international health and health research activities and agendas.

The report proposes the following recommendations:

1. More investment is needed in relatively under-funded areas of health research, especially for a new, innovative approach to research on health systems.
2. Management of health research should be strengthened if research is to contribute to strengthening health systems and building public confidence and trust in science.
3. Stronger emphasis should be placed on translating knowledge into actions to improve health thereby bridging the gap between what is known and what is actually being done.

These recommendations are at the heart of the report's action plan which is outlined in the following section. It is now a matter of urgency to make health systems the focus of national and international efforts in order to improve their ability to provide health care in an equitable fashion.

5.2 Action plan

The following key components of the action plan are described in more detail in the main report, which also mentions several ongoing and planned initiatives. By no means an exhaustive list, it aims to highlight activities which will address the recommendations in an effective and targeted manner.

Increase investments in health research

1. **Focus on health systems research**: A major initiative is urgently needed to support research aimed at strengthening health systems, improving health care delivery, and achieving high and equitable coverage of health services. The level of support for such a programme must be substantially higher than what has been spent on this field of research to date. Research should focus on equity issues including gender, community participation in health research and operational studies of health systems. In addition, standardized indicators need to be developed in order to monitor the performance of health systems and measure the impact of health system reforms.
2. **Financing health research**: As first proposed by the Commission on Health Research and Development in 1990, countries should allocate at least 2% of national health expenditure and 5% of health project assistance to health research. This should include an effort to monitor health research spending within national health accounts. Countries also need to explore

more innovative ways to finance health research. On a global level, major supporters of health research must renew their commitment to reduce the "10/90 gap" (only an estimated 10% of expenditures on health research worldwide is spent in areas that represent 90% of the world's health problems).

3. **New diagnostics, vaccines and therapeutics**: There is a need to continue to promote the role of public-private partnerships and other innovative approaches in addressing the neglected diseases that mainly affect people living in low- and middle-income countries. The development of diagnostics, vaccines and therapeutics for these diseases should be a priority.

Strengthen management of health research systems

4. **Information access**: (i) A number of initiatives promoting access to reliable health information and research should be promoted, expanded and allocated more funding. Where appropriate, such initiatives should also consider non-Internet based strategies such as CD-ROMS, and advances in information technology such as Wi-Fi connectivity; (ii) developing countries should invest in increasing the number of national and regional health and medical journals, improving their quality and expanding distribution, (iii) a global initiative should be launched to improve access to reliable health information in the developing world, led by WHO and its partners. The initiative could consider drafting a declaration of universal access to reliable, relevant and up-to-date health-care and health research information.

5. **International clinical trials register**: Responding to intense current interest in this issue, wide-ranging consultations on the establishment of an international clinical trials register are urgently needed. By improving the efficiency and transparency of the research process, such a register would address major contemporary ethical concerns and also help to build public confidence in science. Information contained in such a register would facilitate international collaboration in specific areas, capacity building activities in countries and public education about clinical research. In the longer term, a strengthened evidence base on such trials will help in the formulation of policy pertaining to health services interventions. National registers of trials taking place in countries should also be established, perhaps led by national ethical review boards.

6. **Ethical research:** Countries should invest in building national capacity for the ethical review of health research, and international organizations and donor agencies should consider allocating resources to help them do so. This fast evolving area has an impact on issues like human rights, justice, fairness, confidentiality, discrimination and stigmatization. At the same time, many researchers and research institutions in the developing world feel disadvantaged when entering into research collaborations with

partners in the developed world. They often have little say in determining priorities and do not share in the financial and intellectual benefits of the research. In recognition of such potential problems, international agencies should consider establishing an international code of conduct for equitable partnerships in health research.

7. **Benchmark national health research systems towards health goals**: As an important managerial tool, countries should give priority to the development of indicators to describe, analyse and monitor health research systems. The aim would be to provide indicators on all key functions and processes within health research systems, such as leadership, ethics, financing, human and institutional collaboration, information sharing, synthesis, and access on a range of research outputs not limited to scientific publications.

8. **Regional and global alliances for research governance**: Regional health research forums in Asia, Africa, Latin America and other regions were established following the International Conference on Health Research for Development in Bangkok in 2000. Their role should be more clearly defined and their activities given more support. The conference also proposed setting up a global coalition for health research. These entities and other forms of alliances or coalitions involving national health research councils, major research institutions or agencies from developed and developing countries need to be critically assessed to ensure their unique and value-added contributions.

Bridge the gap between knowledge and action

9. **Evidence-informed policy and practice:** Several ongoing initiatives in this area should be promoted and provided with more support. Countries should also develop the skills to synthesize research and evidence to help them reach the conclusions that can help to shape policy, improve healthcare and better educate the public. Such skills should be acknowledged as crucial and as a legitimate form of research, and appropriately rewarded. Systematic reviews of existing research should inform decisions on whether to finance further research. A similar approach should also be taken in the development of policy, technical and practice recommendations, including those put forward by WHO. At the global level, more should be invested in improving the quality and coverage of existing databases of research information including those in languages other than English. The publication of systematic reviews as bona fide scientific articles should also be encouraged. Additionally, more systematic reviews on health problems in developing countries should be carried out, and methodologies for performing such reviews beyond clinical trials should be improved. Short research and policy briefs for policy-makers based on research syntheses and systematic reviews should be promoted.

10. **Use of evidence by national policy-makers**: The use of sound evidence to develop health policies at all levels should be practised by all countries. Systems should be created whereby evidence-based advice is relayed to government policy-makers. This could include the training of intermediaries who could communicate researchers' data to policy-makers. Other players, such as parliamentarians, the media and civil society, could also be involved in the process of translating research data into policy. The need is especially acute in developing countries due to sometimes limited access to information and scarce capacity for knowledge translation.

11. **Basic health information**: Countries need to make a concerted effort to build capacity for generating and disseminating reliable and accurate basic health information at the district and national level, and to integrate data collection and analysis within national health systems. This is vital in order to overcome the lack of access to such information on health in many developing countries. This basic health information should cover areas such as mortality, morbidity, disease incidence and prevalence, equity and coverage of health-care interventions and quality of service delivery. It should also include data relevant to scaling up treatment and prevention programmes. Moreover, there is a critical need for data that describe the performance of health systems and critical dimensions of health systems functions (e.g. financing, human resources and service delivery).