OVERVIEW

Today and every day, the lives of vast numbers of people lie in the hands of health systems. From the safe delivery of a healthy baby to the care with dignity of the frail elderly, health systems have a vital and continuing responsibility to people throughout the lifespan. They are crucial to the healthy development of individuals, families and societies everywhere.

In this report, health systems are defined as comprising all the organizations, institutions and resources that are devoted to producing health actions. A health action is defined as any effort, whether in personal health care, public health services or through intersectoral initiatives, whose primary purpose is to improve health.

But while improving health is clearly the main objective of a health system, it is not the only one. The objective of good health itself is really twofold: the best attainable average level – *goodness* – and the smallest feasible differences among individuals and groups – *fairness*. Goodness means a health system responding well to what people expect of it; fairness means it responds equally well to everyone, without discrimination. In *The world health report 2000*, devoted entirely to health systems, the World Health Organization expands its traditional concern for people's physical and mental well-being to emphasize these other elements of goodness and fairness.

To an unprecedented degree, it takes account of the roles people have as providers and consumers of health services, as financial contributors to health systems, as workers within them, and as citizens engaged in the responsible management, or stewardship, of them. And it looks at how well or how badly systems address inequalities, how they respond to people's expectations, and how much or how little they respect people's dignity, rights and freedoms.

The world health report 2000 also breaks new ground in presenting for the first time an index of national health systems' performance in trying to achieve three overall goals: *good health, responsiveness to the expectations of the population,* and *fairness of financial contribution*.

Progress towards them depends crucially on how well systems carry out four vital functions. These are: *service provision, resource generation, financing* and *stewardship*. The report devotes a chapter to each function, and reaches conclusions and makes policy recommendations on each. It places special emphasis on stewardship, which has a profound influence on the other three.

Many questions about health system performance have no clear or simple answers – because outcomes are hard to measure and it is hard to disentangle the health *system*'s contribution from other factors. Building on valuable previous work, this report introduces WHO's framework for assessing health system performance. By clarifying and quantifying

the goals of health systems and relating them to the essential functions, the framework is meant to help Member States measure their own performance, understand the factors that contribute to it, improve it, and respond better to the needs and expectations of the people they serve and represent. The analysis and synthesis of a wealth of information is summarized by a measure of overall achievement and by a performance index which should lead to much new research and policy development. The index will be a regular feature of forthcoming *World health reports* and will be improved and updated every year.

The framework was the basis for round table discussions entitled "*Addressing the major health system challenges*" among Ministers of Health at the 53rd World Health Assembly in Geneva in May 2000. The subject of these discussions is reflected throughout the report, and the outcome of the discussions will help orient future work on the framework.

Policy-makers need to know why health systems perform in certain ways and what they can do to improve the situation. All health systems carry out the functions of providing or delivering personal and non-personal health services; generating the necessary human and physical resources to make that possible; raising and pooling the revenues used to purchase services; and acting as the overall stewards of the resources, powers and expectations entrusted to them.

Comparing the way these functions are actually carried out provides a basis for understanding performance variations over time and among countries. Undoubtedly, many of the concepts and measures used in the report will require refinement. There is an important agenda of developing more and better data on goal attainment and on health system functions. Yet much can be learned from existing information. The report presents the best available evidence to date. In doing so, it seeks to push forward national and global development of the skills and information required to build a solid body of evidence on the level and determinants of performance, as a basis for improving how systems work.

"Improving performance" are therefore the key words and the *raison d'être* of this report. The overall mission of WHO is the attainment by all people of the highest possible level of health, with special emphasis on closing the gaps within and among countries. The Organization's ability to fulfil this mission depends greatly on the effectiveness of health systems in Member States – and strengthening those systems is one of WHO's four strategic directions. It connects very well with the other three: reducing the excess mortality of poor and marginalized populations; dealing effectively with the leading risk factors; and placing health at the centre of the broader development agenda.

Combating disease epidemics, striving to reduce infant mortality, and fighting for safer pregnancy are all WHO priorities. But the Organization will have very little impact in these and other battlegrounds unless it is equally concerned to strengthen the health systems through which the ammunition of life-saving and life-enhancing interventions are delivered to the front line.

This report asserts that the differing degrees of efficiency with which health systems organize and finance themselves, and react to the needs of their populations, explain much of the widening gap in death rates between the rich and poor, in countries and between countries, around the world. Even among countries with similar income levels, there are unacceptably large variations in health outcomes. The report finds that inequalities in life expectancy persist, and are strongly associated with socioeconomic class, even in countries that enjoy an average of quite good health. Furthermore the gap between rich and poor widens when life expectancy is divided into years in good health and years of disability. In effect, the poor not only have shorter lives than the non-poor, a bigger part of their lifetime is surrendered to disability.

In short, how health systems – and the estimated 35 million or more people they employ worldwide – perform makes a profound difference to the quality and value, as well as the length of the lives of the billions of people they serve.

How health systems have evolved

This report's review of the evolution of modern health systems, and their various stages of reform, leaves little doubt that in general they have already contributed enormously to better health for most of the global population during the 20th century.

Today, health systems in all countries, rich and poor, play a bigger and more influential role in people's lives than ever before. Health systems of some sort have existed for as long as people have tried to protect their health and treat diseases. Traditional practices, often integrated with spiritual counselling and providing both preventive and curative care, have existed for thousands of years and often coexist today with modern medicine.

But 100 years ago, organized health systems in the modern sense barely existed. Few people alive then would ever visit a hospital. Most were born into large families and faced an infancy and childhood threatened by a host of potentially fatal diseases – measles, smallpox, malaria and poliomyelitis among them. Infant and child mortality rates were very high, as were maternal mortality rates. Life expectancy was short – even half a century ago it was a mere 48 years at birth. Birth itself invariably occurred at home, rarely with a physician present.

As a brief illustration of the contemporary role of health systems, one particular birth receives special attention in this report. Last year, United Nations experts calculated that the global population would reach six billion on 13 October 1999. On that day, in a maternity clinic in Sarajevo, a baby boy was designated as the sixth billionth person on the planet. He entered the world with a life expectancy of 73 years, the current Bosnian average.

He was born in a big city hospital, staffed by well-trained midwives, nurses, doctors and technicians. They were supported by high-technology equipment, drugs and medicines. The hospital is part of a sophisticated health service, connected in turn to a wide network of people and actions that in one way or another are concerned with measuring, maintaining and improving his health for the rest of his life – as for the rest of the population. Together, all these interested parties, whether they provide services, finance them or set policies to administer them, make up a health system.

Health systems have undergone overlapping generations of reforms in the past 100 years, including the founding of national health care systems and the extension of social insurance schemes. Later came the promotion of primary health care as a route to achieving affordable universal coverage – the goal of health for all. Despite its many virtues, a criticism of this route has been that it gave too little attention to people's *demand* for health care, and instead concentrated almost exclusively on their perceived *needs*. Systems have foundered when these two concepts did not match, because then the supply of services offered could not possibly align with both.

In the past decade or so there has been a gradual shift of vision towards what WHO calls the "new universalism". Rather than all possible care for everyone, or only the simplest and most basic care for the poor, this means delivery to all of high-quality essential care, defined mostly by criteria of effectiveness, cost and social acceptability. It implies explicit choice of priorities among interventions, respecting the ethical principle that it may be necessary and efficient to ration services, but that it is inadmissible to exclude whole groups of the population.

This shift has been partly due to the profound political and economic changes of the last 20 years or so. These include the transformation from centrally planned to market-oriented economies, reduced state intervention in national economies, fewer government controls, and more decentralization.

Ideologically, this has meant greater emphasis on individual choice and responsibility. Politically, it has meant limiting promises and expectations about what governments should do. But at the same time people's expectations of health systems are greater than ever before. Almost every day another new drug or treatment, or a further advance in medicine and health technology, is announced. This pace of progress is matched only by the rate at which the population seeks its share of the benefits.

The result is increasing demands and pressures on health systems, including both their public and private sectors, in all countries, rich or poor. Clearly, limits exist on what governments can finance and on what services they can deliver. This report means to stimulate public policies that acknowledge the constraints governments face. If services are to be provided for all, then not all services can be provided.

THE POTENTIAL TO IMPROVE

Within all systems there are many highly skilled, dedicated people working at all levels to improve the health of their communities. As the new century begins, health systems have the power and the potential to achieve further extraordinary improvements.

Unfortunately, health systems can also misuse their power and squander their potential. Poorly structured, badly led, inefficiently organized and inadequately funded health systems can do more harm than good.

This report finds that many countries are falling far short of their potential, and most are making inadequate efforts in terms of responsiveness and fairness of financial contribution. There are serious shortcomings in the performance of one or more functions in virtually all countries.

These failings result in very large numbers of preventable deaths and disabilities in each country; in unnecessary suffering; in injustice, inequality and denial of basic rights of individuals. The impact is most severe on the poor, who are driven deeper into poverty by lack of financial protection against ill-health. In trying to buy health from their own pockets, sometimes they only succeed in lining the pockets of others.

In this report, the poor also emerge as receiving the worst levels of responsiveness – they are treated with less respect for their dignity, given less choice of service providers and offered lower-quality amenities.

The ultimate responsibility for the overall performance of a country's health system lies with government, which in turn should involve all sectors of society in its stewardship. The careful and responsible management of the well-being of the population is the very essence of good government. For every country it means establishing the best and fairest health system possible with available resources. The health of the people is always a national priority: government responsibility for it is continuous and permanent. Ministries of health must therefore take on a large part of the stewardship of health systems.

Health policy and strategies need to cover the private provision of services and private financing, as well as state funding and activities. Only in this way can health systems as a whole be oriented towards achieving goals that are in the public interest. Stewardship encompasses the tasks of defining the vision and direction of health policy, exerting influence through regulation and advocacy, and collecting and using information. At the interna-

tional level, stewardship means mobilizing the collective action of countries to generate global public goods such as research, while fostering a shared vision towards more equitable development across and within countries. It also means providing an evidence base to assist countries' efforts to improve the performance of their health systems.

But this report finds that some countries appear to have issued no national health policy statement in the past decade; in others, policy exists in the form of documents which gather dust and are never translated into action. Too often, health policy and strategic planning have envisaged unrealistic expansion of the publicly funded health care system, sometimes well in excess of national economic growth. Eventually, the policy and planning document is seen as infeasible and is ignored.

A policy framework should recognize all three health system goals and identify strategies to improve the attainment of each. But not all countries have explicit policies on the overall goodness and fairness of the health system. Public statements about the desired balance among health outcomes, system responsiveness and fairness in financial contribution are yet to be made in many countries. Policy should address the way in which the system's key functions are to be improved.

This report finds that, within governments, many health ministries are seriously shortsighted, focusing on the public sector and often disregarding the – frequently much larger – private provision of care. At worst, governments are capable of turning a blind eye to a "black market" in health, where widespread corruption, bribery, "moonlighting" and other illegal practices have flourished for years and are difficult to tackle successfully. Their vision does not extend far enough to help construct a healthier future.

Moreover, some health ministries are prone to losing sight completely of their most important target: the population at large. Patients and consumers may only come into view when rising public dissatisfaction forces them to the ministry's attention.

Many health ministries condone the evasion of regulations that they themselves have created or are supposed to implement in the public interest. Rules rarely enforced are invitations to abuse. A widespread example is the condoning of public employees charging illicit fees from patients and pocketing the proceeds, a practice known euphemistically as "informal charging". Such corruption deters poor people from using services they need, making health financing even more unfair, and it distorts overall health priorities.

Providing better services

Too many governments know far too little about what is happening in the provision of services to their people. In many countries, some if not most physicians work simultaneously for the government and in private practice. When public providers illegally use public facilities to provide special care to private patients, the public sector ends up subsidizing unofficial private practice. Health professionals are aware of practice-related laws but know that enforcement is weak or non-existent. Professional associations, nominally responsible for self-regulation, are too often ineffective.

Oversight and regulation of private sector providers and insurers must be placed high on national policy agendas. At the same time it is crucial to adopt incentives that are sensitive to performance. Good policy needs to differentiate between providers (public or private) who are contributing to health goals, and those who are doing damage, and encourage or sanction appropriately. Policies to change the balance between providers' autonomy and accountability need to be monitored closely in terms of their effect on health, responsiveness and the distribution of the financing burden.

Where particular practices and procedures are known to be harmful, the health ministry has a clear responsibility to combat them with public information and legal measures. Pharmaceutical sales by unregistered sellers, the dangers of excessive antibiotic prescription and of non-compliance with recommended dosages should all be objects of public stewardship, with active support from information campaigns targeted at patients, the providers in question and local health authorities.

Contrary to what might be expected, the share of private health financing tends to be larger in countries where income levels are lower. But poorer countries seldom have clear lines of policy towards the private sector. They thus have major steps to take in recognizing and communicating with the different groups of private providers, the better to influence and regulate them.

The private sector has the potential to play a positive role in improving the performance of the health system. But for this to happen, governments must fulfil the core public function of stewardship. Proper incentives and adequate information are two powerful tools to improve performance.

To move towards higher quality care, more and better information is commonly required on existing provision, on the interventions offered and on major constraints on service implementation. Local and national risk factors need to be understood. Information on numbers and types of providers is a basic – and often incompletely fulfilled – requirement. An understanding of provider market structure and utilization patterns is also needed, so that policy-makers know why this array of provision exists, as well as where it is growing.

An explicit, public process of priority setting should be undertaken to identify the contents of a benefit package which should be available to all, and which should reflect local disease priorities and cost effectiveness, among other criteria. Supporting mechanisms – clinical protocols, registration, training, licensing and accreditation processes – need to be brought up to date and used. There is a need for a regulatory strategy which distinguishes between the components of the private sector and includes the promotion of self-regulation.

Consumers need to be better informed about what is good and bad for their health, why not all of their expectations can be met, and that they have rights which all providers should respect. Aligning organizational structures and incentives with the overall objectives of policy is a task for stewardship, not just for service providers.

Monitoring is needed to assess behavioural change associated with decentralizing authority over resources and services, and the effects of different types of contractual relationships with public and private providers. Striking a balance between tight control and the independence needed to motivate providers is a delicate task, for which local solutions must be found. Experimentation and adaptation will be necessary in most settings. A supporting process for exchanging information will be necessary to create a 'virtual network' from a large set of semi-autonomous providers.

FINDING A BETTER BALANCE

The report says serious imbalances exist in many countries in terms of human and physical resources, technology and pharmaceuticals. Many countries have too few qualified health personnel, others have too many. Health system staff in many low-income nations are inadequately trained, poorly-paid and work in obsolete facilities with chronic shortages of equipment. One result is a "brain drain" of talented but demoralized professionals who either go abroad or move into private practice. Here again, the poor are most affected.

Overall, governments have too little information on financial flows and the generation of human and material resources. To rectify this, national health accounts (NHAs) should be much more widely calculated and used. They provide the essential information needed to monitor the ratio of capital to recurrent expenditure, or of any one input to the total, and to observe trends. NHAs capture foreign as well as domestic, public as well as private inputs and usefully assemble data on physical quantities – such as the numbers of nurses, medical equipment, district hospitals – as well as their costs.

NHAs in some form now exist for most countries, but they are still often rudimentary and are not yet widely used as tools of stewardship. NHA data allow the ministry of health to think critically about input purchases by all fundholders in the health system.

The concept of strategic purchasing, discussed in this report, does not only apply to the purchase of health care services: it applies equally to the purchase of health system inputs. Where inputs such as trained personnel, diagnostic equipment and vehicles are purchased directly with public funds, the ministry of health has a direct responsibility to ensure that value for money is obtained – not only in terms of good prices, but also in ensuring that effective use is made of the items purchased.

Where health system inputs are purchased by other agencies (such as private insurers, providers, households or other public agencies) the ministry's stewardship role consists of using its regulatory and persuasive influence to ensure that these purchases improve, rather than worsen, the efficiency of the input mix.

The central ministry may have to decide on major capital decisions, such as tertiary hospitals or medical schools. But regional and district health authorities should be entrusted with the larger number of lower-level purchasing decisions, using guidelines, criteria and procedures promoted by central government.

Ensuring a healthy balance between capital and recurrent spending in the health system requires analysis of trends in both public and private spending and a consideration of both domestic and foreign funds. A clear policy framework, incentives, regulation and public information need to be brought to bear on important capital decisions in the entire system to counter ad hoc decisions and political influence.

In terms of human resources, similar combinations of strategy have had some success in tackling the geographical imbalances common within countries. In general, the content of training needs to be reassessed in relation to workers' actual job content, and overall supply often needs to be adjusted to meet employment opportunities.

In some countries where the social return to medical training is negative, educational institutions are being considered for privatization or closure. Certainly, public subsidies for training institutions often need to be reconsidered in the light of strategic purchasing. Rebalancing the intake levels of different training facilities is often possible without closure, and might free resources which could be used to retrain in scarcer skills those health workers who are clearly surplus to requirements.

Major equipment purchases are an easy way for the health system to waste resources, when they are underused, yield little health gain, and use up staff time and recurrent budget. They are also difficult to control. All countries need access to information on technology assessment, though they do not necessarily need to produce this themselves. The stewardship role lies in ensuring that criteria for technology purchase in the public sector (which all countries need) are adhered to, and that the private sector does not receive incentives or public subsidy for its technology purchases unless these further the aim of national policy.

Providers frequently mobilize public support or subscriptions for technology purchase, and stewardship has to ensure that consumers understand why technology purchases have

to be rationed like other services. Identifying the opportunity cost of additional technology in terms of other needed services may help to present the case to the public.

PROTECTING THE POOR

In the world's poorest countries, most people, particularly the poor, have to pay for health care from their own pockets at the very time they are sick and most in need of it. They are less likely to be members of job-based prepayment schemes, and have less access than better-off groups to subsidized services.

This report presents convincing evidence that prepayment is the best form of revenue collection, while out-of-pocket payment tends to be quite regressive and often impedes access to care. In poor countries, the poor often suffer twice – all of them have to pay an unfair share through taxes or insurance schemes, whether or not they use health services, and some of them have also to pay an even more unfair contribution from their pockets. Evidence from many health systems shows that prepayment through insurance schemes leads to greater financing fairness. The main challenge in revenue collection is to expand prepayment, in which public financing or mandatory insurance will play a central role. In the case of revenue pooling, creating as wide a pool as possible is critical to spreading financial risk for health care, and thus reducing individual risk and the spectre of impoverishment from health expenditures.

Insurance systems entail integration of resources from individual contributors or sources both to pool and to share risks across the population. Achieving greater fairness in financing is only achievable through risk pooling – that is, those who are healthy subsidize those who are sick, and those who are rich subsidize those who are poor. Strategies need to be designed for expansion of risk pooling so that progress can be made in such subsidies.

Raising the level of public finance for health is the most obvious route to increased prepayment. But the poorest countries raise less, in public revenue, as a percentage of national income than middle and upper income countries. Where there is no feasible organizational arrangement to boost prepayment levels, both donors and governments should explore ways of building enabling mechanisms for the development or consolidation of very large pools. Insurance schemes designed to expand membership among the poor would, moreover, be an attractive way to channel external assistance in health, alongside government revenue.

Many countries have employment-based schemes which increase benefits for their privileged membership – mainly employees in the formal sector of the economy – rather than widen them for a larger pool. Low income countries could encourage different forms of prepayment – job-based, community-based, or provider-based – as part of a preparatory process of consolidating small pools into larger ones. Governments need to promote community rating (i.e. each member of the community pays the same premium), a common benefit package and portability of benefits among insurance schemes, and public funds should pay for the inclusion of poor people in such schemes.

In middle income countries the policy route to fair prepaid systems is through strengthening the often substantial mandatory, income-based and risk-based insurance schemes, again ensuring increased public funding to include the poor. Although most industrialized countries already have very high levels of prepayment, some of these strategies are also relevant to them.

To ensure that prepaid finance obtains the best possible value for money, strategic purchasing needs to replace much of the traditional machinery linking budget holders to service providers. Budget holders will no longer be passive financial intermediaries. Strategic purchasing means ensuring a coherent set of incentives for providers, whether public or private, to encourage them to offer priority interventions efficiently. Selective contracting and the use of several payment mechanisms are needed to set incentives for better responsiveness and improved health outcomes.

In conclusion, this report sheds new light on what makes health systems behave in certain ways, and offers them better directions to follow in pursuit of their goals. WHO hopes it will help policy-makers weigh the many complex issues involved and make wise choices. If they do so, substantial gains will be possible for all countries; and the poor will be the principal beneficiaries.

Statistical Annex

For centuries governments have compiled data – for tax and other administrative purposes – concerning characteristics of their populations. With time the potential for comprehensiveness and accuracy has increased and, concomitantly, disparities have grown across countries in data adequacy. All countries maintain at least minimal compilations concerning their economies and their populations; and most countries prepare and distribute these data in categories that share major features with those in other countries. This allows the country's decision-makers to compare characteristics of their own country – or its health system – with other countries (or with their own prior experience).

To achieve maximum benefit from major country investments in generating statistics there needs to be a central service to enhance data comparability and quality, to generate and publish comprehensive sets of data over time, and to identify important common themes. Such an effort must, obviously, deal with the problem of variation in data quality and timeliness; and, in the short term, it must make the best possible use of available data. Over a longer period it is important to encourage and assist countries to improve the quality and scope of their statistical system. WHO is now, through its Global Programme on Evidence for Health Policy, investing substantially in enhancing its capacity to improve demographic and health data, and data systems.

A major initial effort of this Programme involved preparation of estimates of numbers of deaths and disease burden by cause for 1998, and the results of that effort are published for the first time in this Annex. Other tables in the Annex summarize data from WHO programmes, from other agencies and from background research for this report.

ANNEX TABLE 1

Sources of data and explanation of column headings

Population

1. Total population size in thousands, for 1998. Source: United Nations dataset *World population prospects 1950—2050 (the 1998 revision)*, New York, United Nations Population Division, 1998.
2. Annual growth rate has been calculated as the average percentage change in population size between 1978 and 1998. Estimates of population size for 1978 and 1998 were from the United Nations dataset *World population prospects 1950—2020 (the 1998 revision)*, New York, United Nations Population Division, 1998.
3. Dependency ratio is defined as the population aged 0–14 and over 65 years as a percentage of the population aged 15–64 years. Estimates of population size for 1978 and 1998 were from the United Nations dataset *World population prospects 1950—2020 (the 1998 revision)*, New York, United Nations Population Division, 1998.
4. Total fertility rate is calculated as the average number of children born to a woman of reproductive age. Estimates for 1978 and 1998 were obtained from *World population prospects: The 1998 revision*, New York, United Nations, 1999.

Mortality rates

5. Infant mortality rate (IMR) is defined as the number of deaths per 1000 live births between birth and exact age one year. Estimates are shown for 1978 and 1998. Source: *World population prospects: The 1998 revision*, New York, United Nations, 1999.
6. The probability of dying between birth and exact age 5 years per 1000 live births is shown for male and female children for 1998. Source: Supplementary tabulations to *World population prospects: The 1998 revision* (New York, United Nations, 1999), Population Division, Department of Economic and Social Affairs of the United Nations Secretariat.
7. The probability of dying between age 15 and 59 years per 1000 population, for males and females in that age group, in 1998. Source: Supplementary tabulations to *World population prospects: The 1998 revision* (New York, United Nations, 1999), Population Division, Department of Economic and Social Affairs of the United Nations Secretariat.
8. Maternal mortality ratio (MMR) is defined as the number of maternal deaths per 100 000 live births. The MMR measures the risk of death once a woman has become pregnant. The estimates of MMR for 1990 should be used with caution. Global best estimates for the year 1995 are currently under development. Further information is available from Director, Department of Reproductive Health and Research, WHO, Geneva.

Social and economic

9. Estimates of life expectancy at birth for males and females in 1978 and 1998 were taken from *World population prospects: The 1998 revision*, New York, United Nations, 1999.
10. Real gross domestic product (GDP) per capita adjusted for purchasing power parity is expressed in 1985 US dollars. Data are from the Penn World Table dataset, Mark 5.6, the Chain index, available at: http://www.nber.org/pwt56.html (Summers R, Heston A. The Penn World Table (Mark 5): An expanded set of international comparisons, 1950–1988. *Quarterly journal of economics*, 1991, **106:** 327–368). The annual average growth rate (calculated as the growth rate over a time period divided by the number of years in that period) of GDP per capita is shown for two periods: 1962–1992 and 1982–1992.
11. Educational attainment: the average number of years of education is given for females aged 25 years and above. The inequality in educational attainment between males and females is expressed as the difference in average number of years of education for men and women, aged 25 years or above. Source: Barro R, Lee JW. International measures of schooling years and schooling quality. *American economic review, Papers and proceedings*, 1986, **2**: 218–223.
12. The measure of malnutrition has been chosen to be the percentage of children under age 5 years who are stunted. Stunting is defined as height for age below 2 standard deviations from the international reference median value. Estimates are shown for male and female children for the latest year for which data were available since 1990. Estimates were provided by the Department of Nutrition for Health and Development, Sustainable Development and Healthy Environments Cluster, WHO, Geneva. Regional averages for the period 1975–1995, for both sexes combined can be found in: *WHO global database on child growth and malnutrition* (document WHO/NUT/97.4. Geneva, World Health Organization, 1997). Detailed information on national data disaggregated by sex, age group, urban/rural and regions can be found at: http://www.who.int/whosis/ under *WHO global database on child growth and malnutrition*.

Health services and finance

13. Estimates of the percentage of children immunized against measles are shown for 1987 and 1997. Source: Department of Vaccines and Other Biologicals, Health Technology and Pharmaceuticals Cluster, WHO, Geneva.
14. Data on total health expenditures as a percentage of GDP and the percentage of health expenditures from public sources are taken from: Bos E et al. *Health, nutrition and population indicators: A statistical handbook*, Washington DC, The World Bank, 1999 (Health, nutrition and population series).

Annex Table 1 Basic indicators for all Member States

	Member States by WHO Region*	POPULATION						MORTALITY RATES						
		Total population		Dependency ratio (per 100)		Total fertility rate		Infant mortality rate (per 1 000)		Probability of dying (per 1 000) under age 5		between age 15 and age 59		Maternal mortality ratio (per 100 000)
		Size (000)	Annual growth rate (%)							Males	Females	Males	Females	
		1998	1978-1998	1978	1998	1978	1998	1978	1998	1998	1998	1998	1998	1990
All Member States		5 884 576	1.6	72	59	3.9	2.7	87	57	83	83	225	156	430
	Africa	601 783	2.8	94	90	6.7	5.4	121	91	172	154	477	428	940
1	Algeria	30 081	2.7	104	70	7.2	3.8	112	44	57	45	147	120	160
2	Angola	12 092	3.0	89	102	6.8	6.8	161	125	217	199	413	355	1 500
3	Benin	5 781	2.9	94	98	7.1	5.8	122	88	142	124	373	318	990
4	Botswana	1 570	3.2	105	83	6.4	4.4	76	59	112	101	676	610	250
5	Burkina Faso	11 305	2.7	100	100	7.8	6.6	127	99	176	166	557	518	930
6	Burundi	6 457	2.5	94	97	6.8	6.3	127	119	189	168	603	545	1 300
7	Cameroon	14 305	2.8	91	90	6.5	5.3	108	74	120	109	389	345	550
8	Cape Verde	408	1.8	110	81	6.7'	3.6	86	56	68	60	213	125	...
9	Central African Republic	3 485	2.3	82	88	5.9	4.9	122	98	172	141	580	521	700
10	Chad	7 270	2.7	83	97	6.6	6.1	154	112	184	164	452	400	1 500
11	Comoros	658	3.1	102	85	7.1	4.8	116	76	112	101	303	254	950
12	Congo	2 785	2.9	93	98	6.3	6.1	91	90	147	116	539	475	890
13	Côte d'Ivoire	14 292	3.2	95	88	7.4	5.1	117	87	144	129	555	549	810
14	Democratic Republic of the Congo	49 139	3.4	94	103	6.5	6.4	117	90	148	130	442	391	870
15	Equatorial Guinea	431	3.7	82	89	5.7	5.6	149	108	184	169	379	322	820
16	Eritrea	3 577	2.3	89	89	6.4	5.7	123	91	154	137	430	374	1 400
17	Ethiopia	59 649	2.8	92	96	6.8	6.3	149	116	193	174	559	528	1 400
18	Gabon	1 167	3.0	67	84	4.4	5.4	122	87	143	127	395	353	500
19	Gambia	1 229	3.6	82	77	6.5	5.2	167	122	212	194	408	350	1 100
20	Ghana	19 162	3.1	92	89	6.5	5.2	99	66	107	95	280	227	740
21	Guinea	7 337	2.7	93	90	7.0	5.5	167	124	207	208	402	366	1 600
22	Guinea-Bissau	1 161	2.3	74	88	5.6	5.8	176	130	214	192	443	391	910
23	Kenya	29 008	3.2	114	90	8.1	4.5	88	66	107	101	515	475	650
24	Lesotho	2 062	2.4	85	79	5.7	4.8	121	93	132	127	362	304	610
25	Liberia	2 666	2.1	92	97	6.8	6.3	167	116	184	163	489	445	560
26	Madagascar	15 057	2.9	94	90	6.6	5.4	130	83	123	110	319	267	490
27	Malawi	10 346	2.9	99	100	7.6	6.8	177	138	223	217	632	599	560
28	Mali	10 694	2.5	96	101	7.1	6.6	180	118	244	227	244	219	1 200
29	Mauritania	2 529	2.7	87	89	6.5	5.5	125	92	155	142	345	290	930
30	Mauritius	1 141	1.0	68	48	3.1	1.9	38	16	22	13	229	111	120
31	Mozambique	18 880	2.5	88	93	6.5	6.3	160	114	193	173	509	461	1 500
32	Namibia	1 660	2.7	87	84	6.0	4.9	98	65	125	119	453	427	370
33	Niger	10 078	3.3	96	103	8.1	6.8	157	115	198	181	393	336	1 200
34	Nigeria	106 409	2.7	95	88	6.9	5.2	109	81	154	140	426	375	1 000
35	Rwanda	6 604	1.6	104	94	8.5	6.2	133	124	213	191	619	578	1 300
36	*Sao Tome and Principe*	*141*	*2.4*	...	...	...	...	...	...	...	...	...	...	...
37	Senegal	9 003	2.7	92	90	7.0	5.6	97	63	117	112	418	317	1 200
38	*Seychelles*	*76*	*1.0*	...	...	...	...	...	...	...	...	...	...	...
39	Sierra Leone	4 568	1.9	85	89	6.5	6.1	192	170	277	248	557	504	1 800
40	South Africa	39 357	2.0	76	64	4.5	3.3	72	59	98	76	507	390	230
41	Swaziland	952	3.0	94	85	6.5	4.7	108	65	109	91	284	220	560
42	Togo	4 397	2.9	91	97	6.6	6.1	117	84	137	120	524	481	640
43	Uganda	20 554	2.6	101	108	6.9	7.1	114	107	181	164	707	675	1 200
44	United Republic of Tanzania	32 102	3.1	100	94	6.8	5.5	113	82	138	123	548	509	770
45	Zambia	8 781	2.5	104	100	7.2	5.6	94	82	149	144	774	724	940
46	Zimbabwe	11 377	2.7	104	82	6.6	3.8	86	69	123	111	713	689	570
	The Americas	802 811	1.5	67	57	3.3	2.4	56	28	39	31	197	109	140
47	*Antigua and Barbuda*	*67*	*0.6*	...	...	...	...	...	...	...	...	...	...	...
48	Argentina	36 123	1.4	61	61	3.4	2.6	39	22	28	22	187	95	100

	SOCIAL AND ECONOMIC											HEALTH SERVICES AND FINANCE				
	Life expectancy at birth (years)				GDP per capita adjusted for purchasing power			Average years of education for population aged 25+		Malnutrition stunting among children under age 5 (%)		Children immunized against measles (%)		Health expenditures		
	Males		Females		in 1985 US$	Annual growth rate (%)		Females	Male excess over females	Males around	Females around			Total (% of GDP)	Public sector (% of GDP)	Public sector (% of total)
	1978	1998	1978	1998	1992	1962-1992	1982-1992	1990	1990	1995	1995	1987	1997	around 1995	around 1995	around 1995
	60	65	63	69	4 123	2.7	2.5	4.5	2.1	...	...	53	82	5.2	2.6	48
	46	49	49	51	1 261	0.9	-1.9	1.9	1.5	...	...	41	57	3.2	1.7	50
1	57	68	59	70	2 719	2.6	-0.4	1.9	1.9	18	18	59	74	4.6	3.3	73
2	38	45	42	48	...	...	...	...	...	...	...	55	78	...	4.1	...
3	45	52	49	55	...	...	...	0.7	1.2	27	23	26	82	...	1.7	...
4	55	46	58	48	...	...	...	2.4	0.5	...	...	48	79	2.9	1.6	55
5	42	44	44	45	514	0.6	0.0	...	...	35	32	65	68	5.5	2.3	42
6	44	41	48	44	569	0.4	1.2	...	...	...	...	54	...	...	0.8	...
7	47	53	50	56	1 029	1.3	-2.2	1.7	1.3	27	25	...	43	1.4	1.0	72
8	59	66	62	71	1 085	3.0	1.9	...	...	...	...	75	82	...	3.4	...
9	42	43	47	47	514	-1.0	-2.6	...	...	27	30	14	...	...	1.9	...
10	39	46	43	49	408	-2.2	1.0	...	...	41	39	16	30	3.7	3.7	98
11	49	57	53	60	527	-0.2	-2.1	...	...	36	32	71	49	1.2	0.9	79
12	46	46	51	51	2 240	2.3	-1.2	2.9	2.2	...	...	66	18	6.3	3.2	50
13	46	46	50	47	1 104	-0.2	-4.2	...	...	25	24	...	68	3.5	1.4	41
14	46	49	50	52	...	...	...	1.3	2.0	47	44	41	20	...	0.2	...
15	40	48	44	52	...	...	...	...	...	...	...	...	82	6.3	5.2	81
16	44	49	47	52	...	...	...	...	...	36	41	...	53	2.0	1.1	55
17	40	42	44	44	...	...	...	...	...	66	63	13	52	2.6	1.6	61
18	45	51	49	54	3 622	1.8	-1.5	...	...	...	...	67	...	...	0.5	...
19	37	45	41	49	...	...	...	0.5	0.8	33	28	88	91	...	2.0	...
20	50	58	54	62	956	0.1	1.9	1.5	2.6	28	24	28	59	1.5	1.4	94
21	38	46	39	47	740	0.8	-0.6	...	...	...	...	...	56	...	1.2	...
22	36	43	39	46	634	0.8	0.0	...	...	...	...	60	51	...	1.1	...
23	51	51	55	53	914	1.5	0.6	1.9	1.9	35	32	...	32	2.6	1.6	62
24	50	55	54	57	952	3.3	-0.8	3.8	-1.1	46	41	84	53	...	4.1	...
25	48	46	51	49	...	...	...	1.0	1.9	...	...	40	...	...	...	...
26	48	56	51	59	608	-2.2	-3.0	...	...	51	48	27	...	...	1.1	...
27	42	39	44	40	496	0.8	0.0	1.6	1.8	50	47	81	87	...	2.3	...
28	44	52	46	55	...	...	...	0.4	0.8	31	29	8	56	2.7	1.2	46
29	44	52	47	55	837	0.1	-0.6	...	...	...	...	27	20	5.2	1.1	21
30	62	68	68	75	6 167	2.4	4.7	4.4	1.6	...	...	...	...	4.0	2.3	58
31	42	44	45	47	711	-1.8	-2.4	0.4	0.7	...	...	37	70	...	4.6	...
32	50	52	53	53	2 774	1.1	-1.2	...	...	30	27	...	57	7.2	3.7	52
33	39	47	42	50	...	...	...	0.3	0.6	41	38	...	42	...	1.6	...
34	43	49	47	52	978	1.9	-3.7	...	...	43	42	24	69	1.3	0.3	25
35	43	39	47	42	762	1.6	-0.7	0.9	1.2	50	47	74	66	...	1.9	...
36	...	...	...	...	...	...	...	...	...	...	...	*69*	*60*	...	*6.2*	...
37	42	51	46	54	...	...	...	1.3	1.1	24	22	...	65	...	2.5	...
38	...	...	...	...	...	...	...	...	...	...	...	*100*	*100*	...	*4.0*	...
39	34	36	37	39	734	-0.9	-3.7	0.8	1.1	...	...	...	28	3.6	1.5	43
40	52	52	59	58	3 068	1.0	-1.6	4.4	0.8	24	22	75	...	7.9	3.6	45
41	48	58	52	63	...	...	...	3.1	0.9	...	...	77	57	...	2.8	...
42	46	48	50	50	530	1.2	-2.1	1.3	2.5	36	32	57	38	3.4	1.2	35
43	45	39	49	40	547	-0.2	-5.6	0.8	1.2	40	37	48	60	3.9	1.8	45
44	47	47	51	49	...	...	...	...	...	45	42	78	69	...	2.5	...
45	48	40	51	41	...	...	...	2.7	2.8	43	42	65	69	3.3	2.6	78
46	52	44	56	45	1 162	0.7	-1.4	1.7	1.3	...	...	80	73	6.2	2.2	35
	65	69	71	76	9 997	1.9	0.8	7.8	0.6	...	...	66	93	8.6	4.1	47
47	...	...	...	...	...	...	...	...	...	...	...	*86*	*93*	*5.4*	*2.9*	*54*
48	65	70	72	77	...	...	...	7.7	0.1	7	2	81	98	9.7	4.3	44

Annex Table 1 Basic indicators for all Member States

	Member States by WHO Region*	POPULATION						MORTALITY RATES						
		Total population		Dependency ratio (per 100)		Total fertility rate		Infant mortality rate (per 1 000)		Probability of dying (per 1 000) under age 5		between age 15 and age 59		Maternal mortality ratio (per 100 000)
		Size (000)	Annual growth rate (%)							Males	Females	Males	Females	
		1998	1978-1998	1978	1998	1978	1998	1978	1998	1998	1998	1998	1998	1990
All Member States		5 884 576	1.6	72	59	3.9	2.7	87	57	83	83	225	156	430
49	Bahamas	296	1.9	78	56	3.2	2.6	29	16	20	15	207	111	100
50	Barbados	268	0.4	68	50	2.2	1.5	27	12	14	15	126	80	43
51	Belize	230	2.5	106	83	6.2	3.7	45	29	37	37	116	85	...
52	Bolivia	7 957	2.2	86	79	5.8	4.4	131	66	92	83	271	219	650
53	Brazil	165 851	1.8	75	54	4.3	2.3	79	42	54	41	292	157	220
54	Canada	30 563	1.2	49	47	1.8	1.6	12	6	8	6	108	61	6
55	Chile	14 824	1.6	67	56	3.0	2.4	45	13	17	13	158	86	65
56	Colombia	40 803	2.0	84	61	4.3	2.8	57	30	43	35	220	119	100
57	Costa Rica	3 841	2.9	77	62	3.9	2.8	30	12	16	13	124	75	55
58	Cuba	11 116	0.7	71	45	2.1	1.6	23	9	13	10	141	101	95
59	*Dominica*	*71*	*-0.2*	...	...	...	...	...	...	...	...	...	...	...
60	Dominican Republic	8 232	2.1	87	62	4.7	2.8	84	34	51	41	167	121	110
61	Ecuador	12 175	2.4	90	65	5.4	3.1	82	46	66	54	190	127	150
62	El Salvador	6 032	1.6	94	70	5.6	3.2	95	32	45	37	239	153	300
63	*Grenada*	*93*	*0.2*	...	...	...	...	...	...	...	...	...	...	...
64	Guatemala	10 801	2.6	95	91	6.4	4.9	91	46	65	57	312	201	200
65	Guyana	850	0.6	85	54	3.9	2.3	67	58	90	65	262	165	...
66	Haiti	7 952	2.1	85	83	6.0	4.4	139	68	112	97	472	367	1 000
67	Honduras	6 147	3.1	101	85	6.6	4.3	81	35	54	43	208	150	220
68	Jamaica	2 538	1.0	95	64	4.0	2.5	37	22	28	25	132	80	120
69	Mexico	95 831	2.0	99	63	5.3	2.8	57	31	41	34	198	108	110
70	Nicaragua	4 807	2.8	100	88	6.4	4.4	90	43	64	53	217	157	160
71	Panama	2 767	2.0	85	60	4.1	2.6	35	21	29	26	148	96	55
72	Paraguay	5 222	2.9	90	78	5.2	4.2	51	39	54	43	178	120	160
73	Peru	24 797	2.1	86	64	5.4	3.0	99	45	71	58	201	135	280
74	*Saint Kitts and Nevis*	*39*	*-0.7*	...	...	...	...	...	...	...	...	...	...	...
75	*Saint Lucia*	*150*	*1.5*	...	...	...	...	...	...	...	...	...	...	...
76	*Saint Vincent and the Grenadines*	*112*	*0.8*	...	...	...	...	...	...	...	...	...	...	...
77	Suriname	414	0.8	92	60	4.2	2.2	44	29	39	28	210	130	...
78	Trinidad and Tobago	1 283	1.0	69	51	3.4	1.7	32	15	19	12	162	107	90
79	United States of America	274 028	1.0	52	52	1.8	2.0	14	7	10	8	154	79	12
80	Uruguay	3 289	0.7	60	60	2.9	2.4	42	18	23	17	179	92	85
81	Venezuela	23 242	2.5	81	65	4.5	3.0	39	21	27	22	184	105	120
	Eastern Mediterranean	473 644	2.8	90	78	6.5	4.4	118	69	107	102	214	172	440
82	Afghanistan	21 354	1.4	85	84	7.2	6.9	183	152	257	257	371	324	1 700
83	Bahrain	595	3.2	67	50	5.2	2.9	43	17	26	17	143	92	60
84	Cyprus	771	1.2	53	55	2.3	2.0	20	9	10	9	115	65	5
85	Djibouti	623	4.7	86	80	6.7	5.3	143	106	182	166	376	319	570
86	Egypt	65 978	2.3	78	68	5.3	3.4	131	51	65	64	201	139	170
87	Iran, Islamic Republic of	65 758	3.0	94	75	6.5	2.8	100	35	52	51	170	150	120
88	Iraq	21 800	3.0	96	82	6.6	5.3	84	95	119	114	243	192	310
89	Jordan	6 304	4.3	108	82	7.4	4.9	65	26	32	31	185	142	150
90	Kuwait	1 811	2.0	77	61	5.9	2.9	34	12	16	14	103	68	29
91	Lebanon	3 191	0.8	85	64	4.3	2.7	48	29	39	31	180	133	300
92	Libyan Arab Jamahiriya	5 339	3.3	95	73	7.4	3.8	63	28	32	31	189	143	220
93	Morocco	27 377	2.0	95	61	5.9	3.1	110	51	74	62	193	142	610
94	Oman	2 382	4.3	89	90	7.2	5.9	95	25	35	24	170	115	190
95	Pakistan	148 166	3.1	92	83	7.0	5.0	130	74	108	104	192	148	340
96	Qatar	579	5.4	53	39	6.1	3.7	46	17	27	18	150	82	...
97	Saudi Arabia	20 181	4.4	90	78	7.3	5.8	75	23	31	24	157	114	130
98	Somalia	9 237	2.9	98	101	7.3	7.3	149	122	212	195	408	350	1 600

	SOCIAL AND ECONOMIC											HEALTH SERVICES AND FINANCE				
	Life expectancy at birth (years)				GDP per capita adjusted for purchasing power			Average years of education for population aged 25+		Malnutrition stunting among children under age 5 (%)		Children immunized against measles (%)		Health expenditures		
	Males		Females		in 1985 US$	Annual growth rate (%)		Females	Male excess over females	Males around	Females around			Total (% of GDP)	Public sector (% of GDP)	Public sector (% of total)
	1978	1998	1978	1998	1992	1962-1992	1982-1992	1990	1990	1995	1995	1987	1997	around 1995	around 1995	around 1995
	60	65	63	69	4 123	2.7	2.5	4.5	2.1	...	...	53	82	5.2	2.6	48
49	63	71	71	77	...	...	...	...	...	...	...	...	93	4.2	2.5	59
50	69	74	74	79	...	...	...	8.2	0.0	...	...	...	92	6.8	4.4	65
51	69	73	71	76	4 253	...	1.8	...	...	...	...	64	98	8.0	6.0	75
52	48	60	52	63	1 721	1.2	-0.8	3.3	1.7	33	26	33	98	7.1	4.1	58
53	60	63	64	71	3 882	2.4	-0.2	3.5	0.1	12	9	63	99	4.6	1.8	40
54	71	76	78	82	16 362	2.6	1.8	10.2	0.3	...	...	70	...	9.2	6.6	71
55	64	72	71	78	4 890	1.6	3.5	6.1	0.1	...	...	92	92	6.2	2.5	40
56	62	67	66	74	3 380	2.2	1.4	4.5	-0.6	16	14	72	89	7.4	2.9	40
57	69	74	73	79	3 569	1.7	1.5	5.3	0.1	6	7	90	99	8.5	6.3	74
58	71	74	75	78	...	...	...	6.4	0.5	...	...	99	99	...	7.9	...
59	...	...	...	...	...	...	...	...	...	...	...	*87*	*99*	*6.3*	*4.0*	*63*
60	60	69	64	73	2 250	1.7	0.0	3.5	0.5	12	9	71	80	5.7	1.8	32
61	60	67	63	72	2 830	2.2	-1.2	5.3	0.7	...	...	46	75	5.3	2.0	39
62	52	67	62	73	1 876	0.6	0.7	3.0	0.8	23	24	48	97	5.9	2.4	41
63	...	...	...	...	...	...	...	...	...	...	...	*77*	*92*	*5.2*	*2.8*	*53*
64	54	61	58	67	2 247	0.9	-0.4	2.2	0.7	50	49	24	74	3.2	1.7	54
65	58	61	63	68	...	...	...	5.4	-0.1	...	...	52	82	5.2	4.3	83
66	49	51	52	56	...	...	...	1.3	1.8	32	32	24	...	3.6	1.3	40
67	56	68	60	72	1 385	0.9	-0.4	3.6	0.2	39	40	69	89	5.6	2.8	50
68	68	73	72	77	...	...	...	4.8	-0.6	...	...	62	88	4.9	2.5	51
69	62	70	69	75	6 253	2.6	0.5	5.4	0.9	23	23	54	97	4.2	2.4	56
70	55	66	60	71	...	...	...	3.1	0.5	25	22	44	94	8.6	5.3	61
71	67	72	71	76	3 332	2.1	-0.8	7.6	-0.2	...	...	78	92	6.7	4.7	70
72	64	67	69	72	2 178	1.9	-1.0	4.5	0.5	14	14	56	61	5.1	1.8	36
73	57	66	60	71	2 092	-0.3	-3.5	5.0	0.9	26	25	35	94	3.7	2.2	60
74	...	...	...	...	*4 799*	...	...	...	...	...	...	*91*	*97*	*5.3*	*3.2*	*61*
75	...	...	...	...	...	...	...	...	...	...	...	*81*	*95*	*3.8*	*2.5*	*66*
76	...	...	...	...	...	...	...	...	...	...	...	*91*	*99*	*7.0*	*5.2*	*74*
77	63	68	68	73	...	...	...	...	...	...	...	70	78	4.0	2.0	50
78	66	72	71	76	...	...	...	6.2	0.1	...	...	68	88	3.4	2.1	61
79	69	73	77	80	17 945	1.8	1.9	11.6	0.9	2	2	82	...	14.0	6.6	47
80	66	70	73	78	5 185	1.0	1.1	6.9	-0.4	10	9	99	80	13.4	7.0	52
81	65	70	71	76	7 082	0.2	0.3	4.8	0.2	15	12	57	68	7.5	3.0	40
	53	63	55	65	2 139	2.2	1.3	1.7	2.2	...	...	57	83	3.6	1.6	38
82	40	45	40	46	...	...	...	0.3	1.4	54	49	31	58	...	...	...
83	64	71	68	75	...	...	...	4.3	0.5	...	...	73	95	7.0	...	...
84	72	76	76	80	9 203	4.5	5.1	7.2	1.2	...	...	91	90	4.6	...	...
85	41	49	45	52	...	...	...	...	...	...	...	22	59	...	...	...
86	53	65	55	68	1 869	2.6	0.8	2.3	2.7	26	23	76	92	3.7	1.6	43
87	58	69	59	70	3 685	0.8	-0.5	2.3	1.9	20	18	62	96	4.8	2.8	58
88	61	61	62	64	...	...	...	2.0	2.3	...	...	66	98	...	...	...
89	59	69	63	72	...	...	...	3.8	2.7	16	16	80	95	7.9	3.7	47
90	68	74	72	78	...	...	...	5.7	0.0	...	...	95	95	...	3.6	...
91	63	68	67	72	...	...	...	...	...	13	12	81	89	5.3	2.1	39
92	56	68	59	72	...	...	...	...	...	16	14	56	92	...	...	...
93	54	65	58	69	2 173	2.3	1.1	...	...	24	24	73	92	3.4	1.6	48
94	54	69	56	73	...	...	...	...	...	19	13	86	98	...	2.5	...
95	53	63	54	65	1 432	2.6	2.4	1.0	2.5	...	...	52	74	3.5	0.8	22
96	64	70	68	75	...	...	...	...	...	8	8	62	87	2.8	...	...
97	58	70	60	73	...	...	...	...	...	...	...	77	92	3.1	...	...
98	40	45	44	49	...	...	...	...	...	...	...	29	...	...	...	...

Annex Table 1 Basic indicators for all Member States

	Member States by WHO Region*	POPULATION						MORTALITY RATES						
		Total population		Dependency ratio (per 100)		Total fertility rate		Infant mortality rate (per 1 000)		Probability of dying (per 1 000) under age 5		between age 15 and age 59		Maternal mortality ratio (per 100 000)
		Size (000)	Annual growth rate (%)							Males	Females	Males	Females	
		1998	1978-1998	1978	1998	1978	1998	1978	1998	1998	1998	1998	1998	1990
All Member States		5 884 576	1.6	72	59	3.9	2.7	87	57	83	83	225	156	430
99	Sudan	28 292	2.4	91	77	6.7	4.6	97	71	115	108	357	302	660
100	Syrian Arab Republic	15 333	3.2	108	84	7.4	4.0	67	33	47	33	197	138	180
101	Tunisia	9 335	2.1	86	60	5.7	2.6	88	30	38	36	176	144	170
102	United Arab Emirates	2 353	5.6	43	46	5.7	3.4	38	16	21	17	99	65	26
103	Yemen	16 887	4.0	115	102	7.6	7.6	158	80	112	114	303	274	1 400
	Europe	870 128	0.5	56	50	2.2	1.6	35	21	30	23	217	95	59
104	Albania	3 119	1.0	73	57	4.2	2.5	50	30	46	39	122	65	65
105	*Andorra*	*72*	*4.4*	...	...	...	...	...	...	...	...	...	...	...
106	Armenia	3 536	0.8	60	53	2.5	1.7	22	26	35	30	222	115	50
107	Austria	8 140	0.4	59	47	1.6	1.4	17	6	8	7	137	63	10
108	Azerbaijan	7 669	1.3	73	58	3.6	2.0	41	36	55	44	243	111	22
109	Belarus	10 315	0.4	52	50	2.1	1.4	22	23	36	20	339	126	37
110	Belgium	10 141	0.2	54	51	1.7	1.6	14	7	9	7	119	64	10
111	Bosnia and Herzegovina	3 675	-0.2	53	41	2.2	1.4	36	15	19	15	172	88	...
112	Bulgaria	8 336	-0.3	51	48	2.2	1.2	22	17	23	16	225	99	27
113	Croatia	4 481	0.2	49	47	2.0	1.6	21	10	14	11	213	86	...
114	Czech Republic	10 282	0.0	57	45	2.3	1.2	18	6	9	7	183	81	15
115	Denmark	5 270	0.2	56	49	1.7	1.7	9	7	10	7	141	96	9
116	Estonia	1 429	-0.1	52	47	2.1	1.3	22	19	33	17	314	109	41
117	Finland	5 154	0.4	48	49	1.6	1.7	9	6	7	6	151	58	11
118	France	58 683	0.5	58	53	1.9	1.7	11	6	8	7	145	63	15
119	Georgia	5 059	0.1	55	54	2.4	1.9	36	20	27	20	221	86	33
120	Germany	82 133	0.2	54	47	1.5	1.3	15	5	7	6	132	66	22
121	Greece	10 600	0.6	57	49	2.3	1.3	25	8	9	8	110	49	10
122	Hungary	10 116	-0.3	53	47	2.1	1.4	27	10	13	10	281	128	30
123	Iceland	276	1.0	62	53	2.3	2.1	9	5	6	6	92	63	0
124	Ireland	3 681	0.5	72	50	3.5	1.9	15	7	9	7	114	66	10
125	Israel	5 984	2.4	71	61	3.4	2.7	18	8	11	9	102	61	7
126	Italy	57 369	0.1	56	47	1.9	1.2	18	7	9	8	108	54	12
127	Kazakhstan	16 319	0.6	64	55	3.1	2.3	45	35	46	36	306	133	80
128	Kyrgyzstan	4 643	1.4	78	72	4.1	3.2	55	40	56	44	282	135	110
129	Latvia	2 424	-0.2	51	49	2.0	1.3	23	18	31	18	334	118	40
130	Lithuania	3 694	0.4	55	50	2.1	1.4	22	21	29	18	309	111	36
131	Luxembourg	422	0.7	50	48	1.5	1.7	13	7	8	8	130	62	0
132	Malta	384	1.0	50	48	2.0	1.9	15	8	11	8	93	55	...
133	*Monaco*	*33*	*1.2*	...	...	...	...	...	...	...	...	...	...	...
134	Netherlands	15 678	0.6	53	47	1.6	1.5	10	6	9	7	102	65	12
135	Norway	4 419	0.4	59	54	1.8	1.9	9	5	7	6	107	59	6
136	Poland	38 718	0.5	51	48	2.3	1.5	23	15	18	14	224	88	19
137	Portugal	9 869	0.2	59	47	2.4	1.4	30	9	12	10	156	72	15
138	Republic of Moldova	4 378	0.5	53	52	2.4	1.8	46	29	39	25	302	156	60
139	Romania	22 474	0.1	57	46	2.6	1.2	31	23	39	26	243	105	130
140	Russian Federation	147 434	0.4	47	46	1.9	1.3	30	18	25	19	400	146	75
141	*San Marino*	*26*	*1.2*	...	...	...	...	...	...	...	...	...	...	...
142	Slovakia	5 377	0.5	57	47	2.5	1.4	22	11	14	12	216	89	...
143	Slovenia	1 993	0.5	54	43	2.2	1.3	17	7	9	8	189	81	13
144	Spain	39 628	0.4	60	46	2.6	1.2	16	7	9	7	129	54	7
145	Sweden	8 875	0.4	56	56	1.6	1.6	8	5	7	6	97	63	7
146	Switzerland	7 299	0.7	52	47	1.5	1.5	10	6	10	7	114	60	6
147	Tajikistan	6 015	2.4	94	84	5.9	4.2	69	57	88	73	219	142	130

	SOCIAL AND ECONOMIC											HEALTH SERVICES AND FINANCE				
	Life expectancy at birth (years)				GDP per capita adjusted for purchasing power			Average years of education for population aged 25+		Malnutrition stunting among children under age 5 (%)		Children immunized against measles (%)		Health expenditures		
	Males		Females		in 1985 US$	Annual growth rate (%)		Females	Male excess over females	Males around	Females around			Total (% of GDP)	Public sector (% of GDP)	Public sector (% of total)
	1978	1998	1978	1998	1992	1962-1992	1982-1992	1990	1990	1995	1995	1987	1997	around 1995	around 1995	around 1995
	60	65	63	69	4 123	2.7	2.5	4.5	2.1	...	...	53	82	5.2	2.6	48
99	45	54	48	56	...	...	...	0.6	1.2	34	34	22	92	0.3	...	...
100	58	67	62	71	...	...	...	2.9	3.0	23	18	63	93	...	...	...
101	60	68	61	71	3 075	3.5	1.7	2.0	2.0	22	23	74	92	5.9	3.0	52
102	65	74	69	76	...	...	...	...	...	...	...	56	95	2.5	2.0	81
103	44	57	44	58	...	...	...	...	...	36	47	22	51	2.5	1.1	43
	67	69	74	77	10 189	2.6	2.0	6.9	0.8	...	...	65	87	7.1	5.2	78
104	67	70	71	76	...	...	...	...	...	...	...	96	95	...	2.5	...
105	...	...	...	...	...	...	...	...	...	...	...	...	*90*	...	...	...
106	69	67	75	74	...	...	...	...	...	...	...	...	92	7.8	3.1	40
107	69	74	76	80	12 955	2.9	2.1	6.6	1.9	...	...	60	90	8.0	6.0	75
108	64	66	72	74	...	...	...	...	...	24	20	...	...	6.1	1.1	19
109	66	62	76	74	...	...	...	...	...	...	...	...	98	6.4	5.3	83
110	69	74	76	81	13 484	2.7	2.1	8.4	0.7	...	...	50	64	7.9	6.9	88
111	67	71	72	76	...	...	...	...	...	...	...	...	85	...	...	...
112	69	68	74	75	5 208	...	2.0	9.0	0.5	...	...	100	93	6.9	5.5	80
113	67	69	74	77	...	...	...	...	...	...	...	...	93	10.1	8.5	84
114	67	70	74	77	...	...	...	...	...	2	2	...	96	9.1	7.4	81
115	71	73	77	78	14 091	2.1	2.0	10.9	0.7	...	...	82	84	6.4	5.1	79
116	65	63	74	75	...	...	...	...	...	...	...	...	88	...	6.4	...
117	68	73	77	81	12 000	2.5	0.7	9.6	0.3	...	...	...	...	7.5	5.6	75
118	70	74	78	82	13 918	2.6	1.5	6.6	0.7	...	...	41	83	9.7	7.8	81
119	67	69	74	77	...	...	...	...	...	...	...	...	95	...	0.6	...
120	69	74	76	80	...	...	...	...	...	...	...	50	...	10.5	8.2	78
121	72	76	76	81	...	...	...	6.4	2.7	...	...	81	90	5.9	4.9	83
122	66	67	73	75	4 645	...	-1.1	8.0	0.9	...	...	100	100	7.3	6.8	93
123	73	77	79	81	12 618	3.0	0.5	7.6	0.7	...	...	...	...	8.0	6.7	84
124	70	74	75	79	9 637	3.3	3.2	8.1	0.0	...	...	...	...	6.4	5.1	81
125	71	76	75	80	9 843	3.1	1.9	8.7	0.7	...	...	89	94	4.1	...	...
126	70	75	77	81	12 721	3.0	2.2	5.7	1.0	...	...	21	75	7.6	5.3	70
127	60	63	70	72	...	...	...	...	...	18	14	...	97	...	2.2	...
128	60	63	68	72	...	...	...	...	...	...	...	...	98	...	3.5	...
129	64	62	74	74	...	...	...	...	...	...	...	...	97	...	4.4	...
130	66	64	75	76	...	...	...	...	...	...	...	...	96	...	4.8	...
131	68	73	75	80	16 798	2.3	3.5	...	...	...	...	77	91	7.0	6.5	93
132	70	75	74	79	...	...	...	6.3	0.8	...	...	59	...	7.4	...	...
133	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
134	72	75	79	81	13 281	2.5	2.0	8.2	0.8	...	...	93	96	8.6	6.6	77
135	72	75	79	81	15 518	3.2	2.5	7.6	0.8	...	...	87	...	7.9	6.5	83
136	67	68	75	77	3 826	...	0.5	9.3	0.6	...	...	94	...	6.0	5.0	83
137	67	72	74	79	...	...	...	3.3	0.7	...	...	81	...	8.2	4.9	60
138	62	64	69	72	...	...	...	...	...	...	...	...	99	...	4.9	...
139	67	66	72	74	...	...	...	8.6	1.3	8	8	90	97	...	3.6	...
140	62	61	73	73	...	...	...	...	...	12	13	92	...	4.8	4.1	87
141	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
142	67	69	74	77	...	...	...	...	...	...	...	...	98	...	4.6	...
143	67	71	75	78	...	...	...	...	...	...	...	...	82	...	7.3	...
144	71	75	77	82	9 802	3.2	3.0	6.1	0.4	...	...	85	...	7.7	5.9	76
145	72	76	78	81	13 986	1.8	1.1	9.3	0.4	...	...	93	...	7.3	5.9	80
146	72	75	79	82	15 887	1.4	1.2	8.3	1.2	...	...	...	...	9.8	7.0	72
147	62	64	67	70	...	...	...	...	...	...	...	...	95	...	5.8	...

Annex Table 1 Basic indicators for all Member States

	Member States by WHO Region[a]	POPULATION						MORTALITY RATES						
		Total population		Dependency ratio (per 100)		Total fertility rate		Infant mortality rate (per 1 000)		Probability of dying (per 1 000) under age 5		between age 15 and age 59		Maternal mortality ratio (per 100 000)
		Size (000)	Annual growth rate (%)							Males	Females	Males	Females	
		1998	1978-1998	1978	1998	1978	1998	1978	1998	1998	1998	1998	1998	1990
All Member States		5 884 576	1.6	72	59	3.9	2.7	87	57	83	83	225	156	430
148	The Former Yugoslav Republic of Macedonia	1 999	0.7	57	50	2.7	2.1	57	23	27	24	146	81	...
149	Turkey	64 479	2.1	80	53	4.5	2.5	120	45	67	52	174	111	180
150	Turkmenistan	4 309	2.3	87	75	5.3	3.6	73	55	86	69	267	154	55
151	Ukraine	50 861	0.1	50	49	2.0	1.4	23	19	30	20	311	124	50
152	United Kingdom	58 649	0.2	58	54	1.7	1.7	14	7	9	8	110	69	9
153	Uzbekistan	23 574	2.2	89	76	5.1	3.4	58	44	69	56	245	145	55
154	Yugoslavia	10 635	0.6	52	50	2.4	1.8	38	18	28	23	157	77	...
	South-East Asia	1 485 056	1.9	79	62	4.9	2.9	121	68	87	97	237	189	610
155	Bangladesh	124 774	2.0	98	67	6.7	3.1	137	79	106	116	295	276	850
156	Bhutan	2 004	2.3	81	88	5.9	5.5	130	63	98	94	268	225	1 600
157	Democratic People's Republic of Korea	23 348	1.5	82	48	3.3	2.1	38	22	27	25	184	108	70
158	India	982 223	2.0	76	64	4.8	3.1	129	72	82	97	230	182	570
159	Indonesia	206 338	1.8	81	56	4.7	2.6	105	48	69	56	236	184	650
160	Maldives	271	3.0	86	91	7.0	5.4	106	50	53	80	208	222	...
161	Myanmar	44 497	1.6	78	51	5.3	2.4	114	79	121	104	262	207	580
162	Nepal	22 847	2.6	85	83	6.2	4.5	142	83	110	124	301	287	1 500
163	Sri Lanka	18 455	1.3	69	51	3.8	2.1	41	18	22	20	171	93	140
164	Thailand	60 300	1.5	83	47	4.3	1.7	56	29	37	33	272	173	200
	Western Pacific	1 651 154	1.3	71	49	3.3	1.9	53	38	43	50	162	100	120
165	Australia	18 520	1.3	55	50	2.1	1.8	13	6	8	6	105	56	9
166	Brunei Darussalam	315	2.8	74	58	4.4	2.8	23	10	11	11	124	64	60
167	Cambodia	10 716	2.4	76	82	4.1	4.6	263	103	141	127	400	323	900
168	China	1 255 698	1.3	73	47	3.3	1.8	52	41	43	54	164	101	95
169	*Cook Islands*	*19*	*0.2*	...	...	...	...	...	...	...	...	...	...	...
170	Fiji	796	1.3	72	59	4.0	2.7	37	20	28	18	148	97	90
171	Japan	126 281	0.5	48	45	1.8	1.4	9	4	6	5	99	50	18
172	*Kiribati*	*81*	*1.6*	...	...	...	...	...	...	...	...	...	...	...
173	Lao People's Democratic Republic	5 163	2.5	81	91	6.7	5.8	135	93	154	146	344	296	650
174	Malaysia	21 410	2.5	78	64	4.2	3.2	34	11	16	13	179	107	80
175	*Marshall Islands*	*60*	*3.1*	...	...	...	...	...	...	...	...	...	...	...
176	*Micronesia, Federated States of*	*114*	*1.9*	...	...	...	...	...	...	...	...	...	...	...
177	Mongolia	2 579	2.5	86	67	6.6	2.6	88	51	72	75	224	166	65
178	*Nauru*	*11*	*2.3*	...	...	...	...	...	...	...	...	...	...	...
179	New Zealand	3 796	1.0	60	53	2.2	2.0	14	7	9	8	125	79	26
180	*Niue*	*2*	*-3.2*	...	...	...	...	...	...	...	...	...	...	...
181	*Palau*	*19*	*2.4*	...	...	...	...	...	...	...	...	...	...	...
182	Papua New Guinea	4 600	2.3	81	72	5.9	4.6	77	61	79	88	370	327	930
183	Philippines	72 944	2.3	82	69	5.0	3.6	62	36	49	38	200	151	280
184	Republic of Korea	46 109	1.1	64	40	2.9	1.7	30	10	13	13	203	98	130
185	Samoa	174	0.6	99	76	6.2	4.2	76	23	25	29	178	125	35
186	Singapore	3 476	2.0	51	41	1.9	1.7	13	5	6	6	118	78	10
187	Solomon Islands	417	3.5	106	86	7.1	4.9	47	23	32	22	160	108	...
188	*Tonga*	*98*	*0.4*	...	...	...	...	...	...	...	...	...	...	...
189	*Tuvalu*	*11*	*2.2*	...	...	...	...	...	...	...	...	...	...	...
190	Vanuatu	182	2.5	91	83	5.5	4.3	84	39	54	42	211	157	280
191	Viet Nam	77 562	2.1	91	66	5.6	2.6	82	38	54	57	218	147	160

[a] Italics indicate less populous Member States (under 150 000 population in 1998).

... Data not available or not applicable.

	SOCIAL AND ECONOMIC											HEALTH SERVICES AND FINANCE				
	Life expectancy at birth (years)				GDP per capita adjusted for purchasing power			Average years of education for population aged 25+		Malnutrition stunting among children under age 5 (%)		Children immunized against measles (%)		Health expenditures		
	Males		Females		in 1985 US$	Annual growth rate (%)		Females	Male excess over females	Males around	Females around			Total (% of GDP)	Public sector (% of GDP)	Public sector (% of total)
	1978	1998	1978	1998	1992	1962-1992	1982-1992	1990	1990	1995	1995	1987	1997	around 1995	around 1995	around 1995
	60	65	63	69	4 123	2.7	2.5	4.5	2.1	...	...	53	82	5.2	2.6	48
148	68	71	71	75	...	...	...	...	...	...	...	...	98	8.3	7.3	89
149	58	67	63	72	3 807	2.8	2.9	2.6	1.6	21	20	50	76	4.2	2.7	65
150	58	62	65	69	...	...	...	...	...	...	...	...	100	...	1.2	...
151	64	64	74	74	...	...	...	...	...	...	...	...	...	...	4.9	...
152	70	75	76	80	12 724	2.0	2.2	8.7	0.1	...	...	76	95	6.9	5.8	84
153	62	64	68	71	...	...	...	...	...	34	29	...	88	...	3.5	...
154	68	70	73	75	...	...	...	6.2	2.1	7	7	92	91	...	...	...
	53	62	53	64	1 558	2.2	3.3	2.4	2.3	...	...	40	85	4.7	1.1	27
155	47	58	46	58	1 510	1.5	2.5	1.2	2.1	54	55	6	97	2.4	1.2	48
156	45	60	47	62	...	...	...	...	...	...	...	52	84	...	2.3	...
157	62	69	69	75	...	...	...	...	...	...	...	94	...	...	...	...
158	53	62	52	63	1 282	1.8	3.2	2.2	2.7	52	52	44	81	5.6	1.2	22
159	52	63	54	67	2 102	4.0	3.5	3.2	1.5	43	41	46	92	1.8	0.6	37
160	56	66	53	63	...	...	...	...	...	28	26	41	96	...	4.9	...
161	50	59	53	62	...	...	...	1.8	0.7	47	42	17	88	...	0.4	...
162	47	58	45	57	...	...	...	0.3	1.5	47	50	37	85	5.0	1.2	24
163	65	71	69	75	2 215	1.9	2.1	5.0	0.9	23	25	55	94	1.9	1.4	76
164	59	66	63	72	3 942	4.7	6.0	4.8	0.8	...	...	52	...	5.3	1.4	26
	64	68	67	73	2 959	4.0	4.1	4.4	3.0	...	...	62	94	4.2	2.3	54
165	70	75	77	81	14 458	2.0	1.8	9.8	0.7	...	...	68	87	8.6	5.7	67
166	68	73	71	78	...	...	...	...	...	...	...	100	98	...	2.2	...
167	30	51	33	55	...	...	...	...	...	...	...	52	68	7.2	0.7	10
168	64	68	66	72	1 493	4.1	4.5	3.4	3.6	32	31	63	96	3.8	2.1	54
169	...	...	...	...	...	...	...	...	...	...	...	*84*	*89*	...	...	...
170	66	71	69	75	...	...	...	7.0	0.9	2	4	64	75	3.4	2.3	68
171	73	77	78	83	15 105	4.9	3.6	8.8	0.8	...	...	...	...	7.2	5.6	78
172	...	...	...	...	...	...	...	...	...	...	...	*14*	*82*	...	*22.8*	...
173	42	52	45	55	...	...	...	...	...	48	47	11	67	2.6	1.3	48
174	64	70	67	74	5 746	4.5	3.3	4.4	2.3	...	...	41	84	2.5	1.5	60
175	...	...	...	...	...	...	...	...	...	...	...	*31*	*52*	...	*12.4*	...
176	...	...	...	...	...	...	...	...	...	...	...	*69*	*74*	...	...	...
177	55	64	58	67	...	...	...	...	...	26	27	61	98	4.7	4.4	92
178	...	...	...	...	...	...	...	...	...	...	...	...	*100*	...	...	...
179	69	74	76	80	11 363	1.1	0.4	10.8	0.9	...	...	67	100	7.2	5.5	76
180	...	...	...	...	...	...	...	...	...	...	...	*94*	*100*	...	...	...
181	...	...	...	...	...	...	...	...	...	...	...	*98*	*83*	...	...	...
182	50	57	50	59	1 606	0.4	-0.3	1.2	1.0	...	...	37	40	...	2.8	...
183	58	67	61	70	1 689	1.1	-1.2	6.8	-0.2	34	31	68	90	2.4	1.3	56
184	61	69	68	76	...	...	...	8.1	2.4	...	...	82	85	5.4	...	34
185	61	69	64	74	...	...	...	...	...	...	...	78	99	...	3.1	...
186	69	75	73	79	12 653	6.7	4.8	5.0	1.0	...	...	94	90	3.5	1.3	37
187	63	70	67	74	...	...	...	...	...	...	...	58	68	5.6	4.8	86
188	...	...	...	...	...	...	...	...	...	...	...	*88*	*97*	...	*4.0*	...
189	...	...	...	...	...	...	...	...	...	...	...	*65*	*100*	...	...	...
190	55	66	59	70	...	...	...	...	...	...	...	34	65	...	3.3	...
191	54	65	58	70	...	...	...	...	...	47	47	42	96	5.2	1.1	22

Annex Table 10 Health system performance in all Member States, WHO indexes, estimates for 1997

PERFORMANCE ON HEALTH LEVEL (DALE)					OVERALL PERFORMANCE				
Rank	Uncertainty interval	Member State	Index	Uncertainty interval	Rank	Uncertainty interval	Member State	Index	Uncertainty interval
1	1 – 5	Oman	0.992	0.975 – 1.000	1	1 – 5	France	0.994	0.982 – 1.000
2	1 – 4	Malta	0.989	0.968 – 1.000	2	1 – 5	Italy	0.991	0.978 – 1.000
3	2 – 7	Italy	0.976	0.957 – 0.994	3	1 – 6	San Marino	0.988	0.973 – 1.000
4	2 – 7	France	0.974	0.953 – 0.994	4	2 – 7	Andorra	0.982	0.966 – 0.997
5	2 – 7	San Marino	0.971	0.949 – 0.988	5	3 – 7	Malta	0.978	0.965 – 0.993
6	3 – 8	Spain	0.968	0.948 – 0.989	6	2 – 11	Singapore	0.973	0.947 – 0.998
7	4 – 9	Andorra	0.964	0.942 – 0.980	7	4 – 8	Spain	0.972	0.959 – 0.985
8	3 – 12	Jamaica	0.956	0.928 – 0.986	8	4 – 14	Oman	0.961	0.938 – 0.985
9	7 – 11	Japan	0.945	0.926 – 0.963	9	7 – 12	Austria	0.959	0.946 – 0.972
10	8 – 15	Saudi Arabia	0.936	0.915 – 0.959	10	8 – 11	Japan	0.957	0.948 – 0.965
11	9 – 13	Greece	0.936	0.920 – 0.951	11	8 – 12	Norway	0.955	0.947 – 0.964
12	9 – 16	Monaco	0.930	0.908 – 0.948	12	10 – 15	Portugal	0.945	0.931 – 0.958
13	10 – 15	Portugal	0.929	0.911 – 0.945	13	10 – 16	Monaco	0.943	0.929 – 0.957
14	10 – 15	Singapore	0.929	0.909 – 0.942	14	13 – 19	Greece	0.933	0.921 – 0.945
15	13 – 17	Austria	0.914	0.896 – 0.931	15	12 – 20	Iceland	0.932	0.917 – 0.948
16	13 – 23	United Arab Emirates	0.907	0.883 – 0.932	16	14 – 21	Luxembourg	0.928	0.914 – 0.942
17	14 – 22	Morocco	0.906	0.886 – 0.925	17	14 – 21	Netherlands	0.928	0.914 – 0.942
18	16 – 23	Norway	0.897	0.878 – 0.914	18	16 – 21	United Kingdom	0.925	0.913 – 0.937
19	17 – 24	Netherlands	0.893	0.875 – 0.911	19	14 – 22	Ireland	0.924	0.909 – 0.939
20	15 – 31	Solomon Islands	0.892	0.863 – 0.920	20	17 – 24	Switzerland	0.916	0.903 – 0.930
21	18 – 26	Sweden	0.890	0.870 – 0.907	21	18 – 24	Belgium	0.915	0.903 – 0.926
22	19 – 28	Cyprus	0.885	0.865 – 0.898	22	14 – 29	Colombia	0.910	0.881 – 0.939
23	19 – 30	Chile	0.884	0.864 – 0.903	23	20 – 26	Sweden	0.908	0.893 – 0.921
24	21 – 28	United Kingdom	0.883	0.866 – 0.900	24	16 – 30	Cyprus	0.906	0.879 – 0.932
25	18 – 32	Costa Rica	0.882	0.859 – 0.898	25	22 – 27	Germany	0.902	0.890 – 0.914
26	21 – 31	Switzerland	0.879	0.860 – 0.891	26	22 – 32	Saudi Arabia	0.894	0.872 – 0.916
27	21 – 31	Iceland	0.879	0.861 – 0.897	27	23 – 33	United Arab Emirates	0.886	0.861 – 0.911
28	23 – 30	Belgium	0.878	0.860 – 0.894	28	26 – 32	Israel	0.884	0.870 – 0.897
29	23 – 33	Venezuela, Bolivarian Republic of	0.873	0.853 – 0.891	29	18 – 39	Morocco	0.882	0.834 – 0.925
30	23 – 37	Bahrain	0.867	0.843 – 0.890	30	27 – 32	Canada	0.881	0.868 – 0.894
31	28 – 35	Luxembourg	0.864	0.847 – 0.881	31	27 – 33	Finland	0.881	0.866 – 0.895
32	29 – 38	Ireland	0.859	0.840 – 0.870	32	28 – 34	Australia	0.876	0.861 – 0.891
33	27 – 40	Turkey	0.858	0.835 – 0.878	33	22 – 43	Chile	0.870	0.816 – 0.918
34	25 – 48	Belize	0.853	0.821 – 0.884	34	32 – 36	Denmark	0.862	0.848 – 0.874
35	33 – 40	Canada	0.849	0.832 – 0.864	35	31 – 41	Dominica	0.854	0.824 – 0.883
36	32 – 42	Cuba	0.849	0.830 – 0.866	36	33 – 40	Costa Rica	0.849	0.825 – 0.871
37	30 – 49	El Salvador	0.846	0.817 – 0.873	37	35 – 44	United States of America	0.838	0.817 – 0.859
38	28 – 52	Saint Vincent and the Grenadines	0.845	0.812 – 0.876	38	34 – 46	Slovenia	0.838	0.813 – 0.859
39	35 – 43	Australia	0.844	0.826 – 0.861	39	36 – 44	Cuba	0.834	0.816 – 0.852
40	36 – 44	Israel	0.841	0.825 – 0.858	40	36 – 48	Brunei Darussalam	0.829	0.808 – 0.849
41	39 – 47	Germany	0.836	0.819 – 0.852	41	38 – 45	New Zealand	0.827	0.815 – 0.840
42	33 – 54	Dominican Republic	0.834	0.806 – 0.863	42	37 – 48	Bahrain	0.824	0.804 – 0.845
43	37 – 53	Egypt	0.829	0.811 – 0.849	43	39 – 53	Croatia	0.812	0.782 – 0.837
44	41 – 50	Finland	0.829	0.812 – 0.844	44	41 – 51	Qatar	0.812	0.793 – 0.831
45	38 – 55	Algeria	0.829	0.808 – 0.850	45	41 – 52	Kuwait	0.810	0.790 – 0.830
46	41 – 55	Tunisia	0.824	0.803 – 0.844	46	41 – 53	Barbados	0.808	0.779 – 0.834
47	38 – 58	Yugoslavia	0.824	0.798 – 0.848	47	36 – 59	Thailand	0.807	0.759 – 0.852
48	40 – 61	Honduras	0.820	0.793 – 0.844	48	43 – 54	Czech Republic	0.805	0.781 – 0.825
49	37 – 63	Grenada	0.819	0.789 – 0.850	49	42 – 55	Malaysia	0.802	0.772 – 0.830
50	42 – 59	Uruguay	0.819	0.794 – 0.842	50	45 – 59	Poland	0.793	0.762 – 0.819
51	41 – 64	Colombia	0.814	0.787 – 0.843	51	38 – 67	Dominican Republic	0.789	0.735 – 0.845
52	42 – 65	Paraguay	0.813	0.785 – 0.842	52	41 – 67	Tunisia	0.785	0.741 – 0.832
53	43 – 64	Qatar	0.813	0.786 – 0.839	53	47 – 62	Jamaica	0.782	0.754 – 0.809
54	43 – 69	Saint Lucia	0.809	0.781 – 0.837	54	50 – 64	Venezuela, Bolivarian Republic of	0.775	0.745 – 0.803
55	41 – 70	Cape Verde	0.808	0.776 – 0.842	55	41 – 75	Albania	0.774	0.709 – 0.834

PERFORMANCE ON HEALTH LEVEL (DALE)					OVERALL PERFORMANCE				
Rank	Uncertainty interval	Member State	Index	Uncertainty interval	Rank	Uncertainty interval	Member State	Index	Uncertainty interval
56	47 – 64	Armenia	0.806	0.785 – 0.823	56	51 – 63	Seychelles	0.773	0.747 – 0.797
57	51 – 61	Croatia	0.805	0.789 – 0.821	57	47 – 77	Paraguay	0.761	0.714 – 0.806
58	48 – 65	Iran, Islamic Republic of	0.805	0.783 – 0.827	58	55 – 67	Republic of Korea	0.759	0.740 – 0.776
59	45 – 73	Dominica	0.804	0.774 – 0.833	59	50 – 78	Senegal	0.756	0.711 – 0.800
60	49 – 67	Azerbaijan	0.803	0.781 – 0.820	60	53 – 73	Philippines	0.755	0.720 – 0.789
61	52 – 65	China	0.800	0.782 – 0.813	61	52 – 74	Mexico	0.755	0.719 – 0.789
62	55 – 66	Slovenia	0.797	0.781 – 0.813	62	54 – 73	Slovakia	0.754	0.721 – 0.781
63	56 – 73	Mexico	0.789	0.771 – 0.808	63	49 – 81	Egypt	0.752	0.707 – 0.798
64	55 – 76	Albania	0.789	0.766 – 0.808	64	50 – 80	Kazakhstan	0.752	0.699 – 0.802
65	61 – 72	Denmark	0.785	0.769 – 0.801	65	55 – 80	Uruguay	0.745	0.702 – 0.782
66	57 – 80	Sri Lanka	0.783	0.761 – 0.807	66	59 – 74	Hungary	0.743	0.713 – 0.768
67	57 – 80	Panama	0.783	0.759 – 0.807	67	53 – 81	Trinidad and Tobago	0.742	0.695 – 0.784
68	56 – 83	Kuwait	0.782	0.753 – 0.808	68	59 – 75	Saint Lucia	0.740	0.717 – 0.765
69	61 – 78	The former Yugoslav Republic of Macedonia	0.781	0.761 – 0.796	69	58 – 81	Belize	0.736	0.697 – 0.772
70	59 – 83	Bosnia and Herzegovina	0.780	0.754 – 0.803	70	60 – 81	Turkey	0.734	0.698 – 0.764
71	65 – 76	Argentina	0.779	0.762 – 0.794	71	58 – 83	Nicaragua	0.733	0.696 – 0.770
72	67 – 78	United States of America	0.774	0.758 – 0.789	72	64 – 84	Belarus	0.723	0.691 – 0.750
73	61 – 86	Bhutan	0.773	0.748 – 0.797	73	65 – 82	Lithuania	0.722	0.690 – 0.750
74	63 – 84	Nicaragua	0.772	0.750 – 0.793	74	63 – 83	Saint Vincent and the Grenadines	0.722	0.686 – 0.754
75	65 – 84	Iraq	0.770	0.752 – 0.791	75	66 – 81	Argentina	0.722	0.695 – 0.747
76	67 – 85	Brunei Darussalam	0.768	0.749 – 0.787	76	68 – 84	Sri Lanka	0.716	0.692 – 0.740
77	61 – 88	Suriname	0.768	0.740 – 0.798	77	68 – 85	Estonia	0.714	0.684 – 0.741
78	66 – 88	Brazil	0.767	0.745 – 0.787	78	57 – 99	Guatemala	0.713	0.642 – 0.774
79	70 – 84	Trinidad and Tobago	0.767	0.750 – 0.780	79	70 – 88	Ukraine	0.708	0.674 – 0.734
80	72 – 83	New Zealand	0.766	0.750 – 0.780	80	68 – 93	Solomon Islands	0.705	0.664 – 0.739
81	73 – 83	Czech Republic	0.765	0.749 – 0.779	81	70 – 92	Algeria	0.701	0.669 – 0.730
82	66 – 91	Yemen	0.761	0.733 – 0.789	82	75 – 88	Palau	0.700	0.679 – 0.719
83	72 – 88	Seychelles	0.759	0.739 – 0.778	83	75 – 88	Jordan	0.698	0.675 – 0.720
84	73 – 91	Georgia	0.758	0.736 – 0.776	84	75 – 91	Mauritius	0.691	0.665 – 0.719
85	73 – 89	Pakistan	0.757	0.738 – 0.777	85	74 – 96	Grenada	0.689	0.652 – 0.723
86	75 – 92	Malaysia	0.751	0.731 – 0.771	86	76 – 93	Antigua and Barbuda	0.688	0.657 – 0.718
87	77 – 92	Barbados	0.749	0.730 – 0.770	87	79 – 96	Libyan Arab Jamahiriya	0.683	0.655 – 0.707
88	85 – 92	Slovakia	0.742	0.729 – 0.757	88	69 – 111	Bangladesh	0.675	0.618 – 0.732
89	84 – 94	Poland	0.742	0.723 – 0.758	89	83 – 107	The former Yugoslav Republic of Macedonia	0.664	0.630 – 0.695
90	79 – 98	Indonesia	0.741	0.715 – 0.766	90	84 – 106	Bosnia and Herzegovina	0.664	0.632 – 0.694
91	85 – 99	Syrian Arab Republic	0.733	0.712 – 0.755	91	85 – 104	Lebanon	0.664	0.638 – 0.688
92	89 – 96	Bulgaria	0.733	0.717 – 0.747	92	85 – 107	Indonesia	0.660	0.632 – 0.689
93	89 – 103	Lithuania	0.724	0.705 – 0.742	93	83 – 110	Iran, Islamic Republic of	0.659	0.620 – 0.693
94	89 – 104	Libyan Arab Jamahiriya	0.723	0.699 – 0.746	94	87 – 108	Bahamas	0.657	0.625 – 0.687
95	89 – 105	Cook Islands	0.722	0.696 – 0.746	95	87 – 107	Panama	0.656	0.627 – 0.686
96	89 – 104	Ecuador	0.721	0.700 – 0.742	96	90 – 106	Fiji	0.653	0.630 – 0.674
97	91 – 105	Lebanon	0.719	0.697 – 0.740	97	78 – 123	Benin	0.647	0.573 – 0.710
98	93 – 107	Nepal	0.714	0.691 – 0.736	98	94 – 107	Nauru	0.647	0.630 – 0.664
99	93 – 107	Guatemala	0.714	0.691 – 0.735	99	92 – 110	Romania	0.645	0.624 – 0.666
100	94 – 107	Jordan	0.711	0.689 – 0.732	100	90 – 113	Saint Kitts and Nevis	0.643	0.611 – 0.678
101	97 – 104	Ukraine	0.711	0.695 – 0.726	101	92 – 114	Republic of Moldova	0.639	0.600 – 0.672
102	93 – 111	Thailand	0.710	0.682 – 0.736	102	94 – 113	Bulgaria	0.639	0.617 – 0.660
103	93 – 109	Bangladesh	0.709	0.684 – 0.735	103	91 – 117	Iraq	0.637	0.597 – 0.669
104	92 – 115	Guyana	0.704	0.672 – 0.738	104	86 – 126	Armenia	0.630	0.566 – 0.682
105	101 – 111	Hungary	0.698	0.682 – 0.714	105	94 – 118	Latvia	0.630	0.589 – 0.665
106	102 – 111	Republic of Moldova	0.696	0.680 – 0.710	106	94 – 120	Yugoslavia	0.629	0.586 – 0.664
107	100 – 113	Republic of Korea	0.694	0.674 – 0.711	107	95 – 121	Cook Islands	0.628	0.583 – 0.664
108	93 – 121	Niue	0.693	0.650 – 0.731	108	94 – 120	Syrian Arab Republic	0.628	0.589 – 0.661

Annex Table 10 Health system performance in all Member States, WHO indexes, estimates for 1997

PERFORMANCE ON HEALTH LEVEL (DALE)					OVERALL PERFORMANCE				
Rank	Uncertainty interval	Member State	Index	Uncertainty interval	Rank	Uncertainty interval	Member State	Index	Uncertainty interval
109	103 – 116	Gambia	0.687	0.671 – 0.704	109	93 – 122	Azerbaijan	0.626	0.582 – 0.665
110	100 – 121	Micronesia, Federated States of	0.684	0.656 – 0.717	110	91 – 123	Suriname	0.623	0.571 – 0.671
111	107 – 117	Romania	0.682	0.668 – 0.696	111	88 – 125	Ecuador	0.619	0.565 – 0.684
112	107 – 119	Uzbekistan	0.681	0.662 – 0.700	112	105 – 118	India	0.617	0.599 – 0.638
113	105 – 120	Mauritius	0.679	0.657 – 0.702	113	95 – 127	Cape Verde	0.617	0.561 – 0.664
114	105 – 121	Tonga	0.677	0.651 – 0.704	114	103 – 121	Georgia	0.615	0.583 – 0.642
115	107 – 119	Estonia	0.677	0.657 – 0.694	115	94 – 130	El Salvador	0.608	0.544 – 0.667
116	109 – 119	Belarus	0.676	0.657 – 0.692	116	106 – 121	Tonga	0.607	0.582 – 0.632
117	109 – 121	Sao Tome and Principe	0.671	0.651 – 0.691	117	92 – 134	Uzbekistan	0.599	0.532 – 0.668
118	112 – 120	India	0.670	0.654 – 0.683	118	86 – 139	Comoros	0.592	0.509 – 0.689
119	111 – 123	Peru	0.665	0.643 – 0.686	119	114 – 126	Samoa	0.589	0.564 – 0.612
120	108 – 123	Vanuatu	0.665	0.639 – 0.689	120	92 – 140	Yemen	0.587	0.497 – 0.672
121	115 – 125	Latvia	0.655	0.631 – 0.677	121	114 – 129	Niue	0.584	0.549 – 0.614
122	114 – 127	Saint Kitts and Nevis	0.650	0.621 – 0.679	122	109 – 132	Pakistan	0.583	0.541 – 0.626
123	115 – 131	Antigua and Barbuda	0.641	0.606 – 0.678	123	114 – 131	Micronesia, Federated States of	0.579	0.543 – 0.610
124	120 – 133	Fiji	0.632	0.600 – 0.662	124	111 – 136	Bhutan	0.575	0.520 – 0.618
125	121 – 131	Palau	0.632	0.606 – 0.656	125	111 – 136	Brazil	0.573	0.526 – 0.619
126	122 – 131	Philippines	0.630	0.608 – 0.653	126	112 – 135	Bolivia	0.571	0.526 – 0.615
127	124 – 131	Russian Federation	0.623	0.606 – 0.638	127	118 – 138	Vanuatu	0.559	0.512 – 0.594
128	123 – 134	Tuvalu	0.618	0.594 – 0.644	128	119 – 140	Guyana	0.554	0.504 – 0.593
129	124 – 137	Myanmar	0.612	0.584 – 0.641	129	122 – 138	Peru	0.547	0.517 – 0.577
130	125 – 136	Viet Nam	0.611	0.587 – 0.634	130	126 – 136	Russian Federation	0.544	0.527 – 0.563
131	127 – 139	Samoa	0.602	0.579 – 0.626	131	115 – 145	Honduras	0.544	0.471 – 0.611
132	128 – 138	Senegal	0.601	0.584 – 0.620	132	114 – 147	Burkina Faso	0.543	0.472 – 0.611
133	129 – 139	Côte d'Ivoire	0.598	0.580 – 0.617	133	124 – 144	Sao Tome and Principe	0.535	0.482 – 0.575
134	128 – 140	Kyrgyzstan	0.598	0.575 – 0.620	134	119 – 151	Sudan	0.524	0.447 – 0.594
135	129 – 138	Kazakhstan	0.598	0.581 – 0.615	135	118 – 150	Ghana	0.522	0.452 – 0.596
136	129 – 139	Benin	0.596	0.576 – 0.616	136	130 – 145	Tuvalu	0.518	0.481 – 0.551
137	127 – 142	Bahamas	0.593	0.564 – 0.624	137	124 – 149	Côte d'Ivoire	0.517	0.463 – 0.572
138	132 – 144	Mongolia	0.581	0.555 – 0.607	138	120 – 152	Haiti	0.517	0.439 – 0.595
139	134 – 143	Haiti	0.580	0.561 – 0.599	139	129 – 149	Gabon	0.511	0.456 – 0.553
140	131 – 144	Marshall Islands	0.579	0.549 – 0.609	140	130 – 148	Kenya	0.505	0.461 – 0.549
141	137 – 145	Comoros	0.570	0.550 – 0.590	141	133 – 147	Marshall Islands	0.504	0.469 – 0.534
142	137 – 145	Bolivia	0.567	0.544 – 0.590	142	135 – 150	Kiribati	0.495	0.455 – 0.529
143	139 – 146	Gabon	0.559	0.538 – 0.579	143	125 – 157	Burundi	0.494	0.411 – 0.572
144	138 – 148	Kiribati	0.554	0.525 – 0.581	144	125 – 162	China	0.485	0.375 – 0.567
145	140 – 148	Tajikistan	0.551	0.523 – 0.580	145	134 – 154	Mongolia	0.483	0.429 – 0.531
146	141 – 149	Papua New Guinea	0.546	0.520 – 0.572	146	135 – 154	Gambia	0.482	0.427 – 0.533
147	144 – 154	Maldives	0.524	0.496 – 0.555	147	138 – 154	Maldives	0.477	0.430 – 0.516
148	146 – 153	Eritrea	0.521	0.504 – 0.538	148	137 – 159	Papua New Guinea	0.467	0.400 – 0.522
149	146 – 154	Sudan	0.519	0.496 – 0.543	149	136 – 158	Uganda	0.464	0.404 – 0.526
150	146 – 155	Afghanistan	0.517	0.488 – 0.547	150	138 – 159	Nepal	0.457	0.400 – 0.516
151	147 – 153	Mauritania	0.517	0.501 – 0.533	151	143 – 157	Kyrgyzstan	0.455	0.410 – 0.490
152	145 – 158	Turkmenistan	0.513	0.479 – 0.546	152	142 – 158	Togo	0.449	0.398 – 0.501
153	147 – 156	Democratic People's Republic of Korea	0.510	0.485 – 0.536	153	143 – 161	Turkmenistan	0.443	0.390 – 0.490
154	148 – 157	Somalia	0.506	0.480 – 0.530	154	147 – 163	Tajikistan	0.428	0.381 – 0.470
155	152 – 160	Lao People's Democratic Republic	0.489	0.466 – 0.510	155	143 – 167	Zimbabwe	0.427	0.352 – 0.497
156	154 – 162	Guinea-Bissau	0.481	0.462 – 0.499	156	145 – 166	United Republic of Tanzania	0.422	0.368 – 0.479
157	153 – 162	Cambodia	0.481	0.460 – 0.501	157	149 – 168	Djibouti	0.414	0.355 – 0.459
158	153 – 162	Ghana	0.479	0.457 – 0.500	158	152 – 170	Eritrea	0.399	0.339 – 0.446
159	155 – 164	Togo	0.472	0.452 – 0.492	159	149 – 170	Madagascar	0.397	0.329 – 0.463
160	157 – 164	Guinea	0.469	0.455 – 0.483	160	155 – 166	Viet Nam	0.393	0.366 – 0.420
161	156 – 165	Chad	0.465	0.444 – 0.487	161	155 – 170	Guinea	0.385	0.334 – 0.425
162	157 – 166	Burkina Faso	0.463	0.441 – 0.483	162	154 – 172	Mauritania	0.384	0.328 – 0.431

PERFORMANCE ON HEALTH LEVEL (DALE)					OVERALL PERFORMANCE				
Rank	Uncertainty interval	Member State	Index	Uncertainty interval	Rank	Uncertainty interval	Member State	Index	Uncertainty interval
163	158 – 167	Djibouti	0.457	0.434 – 0.479	163	156 – 176	Mali	0.361	0.284 – 0.429
164	160 – 166	Central African Republic	0.454	0.436 – 0.470	164	150 – 181	Cameroon	0.357	0.246 – 0.458
165	159 – 167	Angola	0.453	0.433 – 0.473	165	157 – 178	Lao People's Democratic Republic	0.356	0.298 – 0.410
166	162 – 168	Nauru	0.444	0.424 – 0.464	166	160 – 176	Congo	0.354	0.302 – 0.401
167	164 – 170	Congo	0.433	0.411 – 0.454	167	157 – 180	Democratic People's Republic of Korea	0.353	0.278 – 0.414
168	164 – 172	Mozambique	0.424	0.399 – 0.450	168	158 – 180	Namibia	0.340	0.268 – 0.413
169	167 – 171	Ethiopia	0.418	0.400 – 0.435	169	164 – 179	Botswana	0.338	0.288 – 0.373
170	168 – 172	Mali	0.410	0.393 – 0.426	170	158 – 180	Niger	0.337	0.266 – 0.416
171	168 – 174	Burundi	0.403	0.374 – 0.435	171	163 – 180	Equatorial Guinea	0.337	0.277 – 0.384
172	169 – 174	Cameroon	0.399	0.375 – 0.421	172	161 – 182	Rwanda	0.327	0.268 – 0.389
173	170 – 174	Madagascar	0.394	0.378 – 0.410	173	164 – 181	Afghanistan	0.325	0.262 – 0.376
174	172 – 175	Equatorial Guinea	0.377	0.355 – 0.400	174	161 – 184	Cambodia	0.322	0.234 – 0.392
175	174 – 176	Nigeria	0.353	0.331 – 0.375	175	164 – 182	South Africa	0.319	0.251 – 0.374
176	175 – 178	Liberia	0.337	0.318 – 0.355	176	164 – 183	Guinea-Bissau	0.314	0.239 – 0.375
177	176 – 178	Niger	0.323	0.306 – 0.340	177	166 – 184	Swaziland	0.305	0.234 – 0.369
178	176 – 178	Kenya	0.320	0.298 – 0.343	178	167 – 183	Chad	0.303	0.231 – 0.363
179	179 – 180	Uganda	0.280	0.264 – 0.295	179	167 – 186	Somalia	0.286	0.199 – 0.369
180	179 – 180	United Republic of Tanzania	0.279	0.260 – 0.298	180	173 – 185	Ethiopia	0.276	0.215 – 0.326
181	181 – 185	Rwanda	0.240	0.214 – 0.265	181	172 – 186	Angola	0.275	0.198 – 0.343
182	181 – 185	South Africa	0.232	0.209 – 0.251	182	170 – 186	Zambia	0.269	0.204 – 0.339
183	181 – 185	Sierra Leone	0.230	0.213 – 0.247	183	174 – 186	Lesotho	0.266	0.205 – 0.319
184	181 – 186	Swaziland	0.229	0.205 – 0.255	184	170 – 187	Mozambique	0.260	0.186 – 0.339
185	182 – 187	Democratic Republic of the Congo	0.217	0.198 – 0.235	185	171 – 188	Malawi	0.251	0.174 – 0.332
186	183 – 188	Lesotho	0.211	0.187 – 0.236	186	180 – 189	Liberia	0.200	0.117 – 0.282
187	186 – 188	Malawi	0.196	0.181 – 0.211	187	183 – 189	Nigeria	0.176	0.094 – 0.251
188	187 – 189	Botswana	0.183	0.172 – 0.194	188	185 – 189	Democratic Republic of the Congo	0.171	0.100 – 0.232
189	185 – 189	Namibia	0.183	0.152 – 0.214	189	179 – 190	Central African Republic	0.156	0.000 – 0.306
190	190	Zambia	0.112	0.095 – 0.129	190	175 – 191	Myanmar	0.138	0.000 – 0.311
191	191	Zimbabwe	0.080	0.057 – 0.103	191	190 – 191	Sierra Leone	0.000	0.000 – 0.079

Annex Table 1 Health system attainment and performance in all Member States, ranked by eight measures, estimates for 1997

Member State	ATTAINMENT OF GOALS						Health expenditure per capita in international dollars	PERFORMANCE	
	Health		Responsiveness		Fairness in financial contribution	Overall goal attainment		On level of health	Overall health system performance
	Level (DALE)	Distribution	Level	Distribution					
Afghanistan	168	182	181-182	172-173	103-104	183	184	150	173
Albania	102	129	136	117	173-174	86	149	64	55
Algeria	84	110	90-91	50-52	74-75	99	114	45	81
Andorra	10	25	28	39-42	33-34	17	23	7	4
Angola	165	178	177	188	103-104	181	164	165	181
Antigua and Barbuda	48	58	47-48	39-42	116-120	71	43	123	86
Argentina	39	60	40	3-38	89-95	49	34	71	75
Armenia	41	63	92	111-112	181	81	102	56	104
Australia	2	17	12-13	3-38	26-29	12	17	39	32
Austria	17	8	12-13	3-38	12-15	10	6	15	9
Azerbaijan	65	99	130-131	125	116-120	103	162	60	109
Bahamas	109	67	18	3-38	138-139	64	22	137	94
Bahrain	61	72	43-44	3-38	61	58	48	30	42
Bangladesh	140	125	178	181	51-52	131	144	103	88
Barbados	53	36	39	3-38	107	38	36	87	46
Belarus	83	46	76-79	45-47	84-86	53	74	116	72
Belgium	16	26	16-17	3-38	3-5	13	15	28	21
Belize	94	95	105-107	90	146	104	88	34	69
Benin	157	132	175-176	160	140-141	143	171	136	97
Bhutan	138	158	163	137-138	89-95	144	135	73	124
Bolivia	133	118	151-153	178	68	117	101	142	126
Bosnia and Herzegovina	56	79	108-110	124	82-83	79	105	70	90
Botswana	187	146	76-79	111-112	89-95	168	85	188	169
Brazil	111	108	130-131	84-85	189	125	54	78	125
Brunei Darussalam	59	42	24	3-38	89-95	37	32	76	40
Bulgaria	60	53	161	2	170	74	96	92	102
Burkina Faso	178	137	174	164	173-174	159	173	162	132
Burundi	179	154	171	168	114	161	186	171	143
Cambodia	148	150	137-138	137-138	183	166	140	157	174
Cameroon	156	160	156	183	182	163	131	172	164
Canada	12	18	7-8	3-38	17-19	7	10	35	30
Cape Verde	118	123	154	134-135	89-95	126	150	55	113
Central African Republic	175	189	183	191	166	190	178	164	189
Chad	161	175	181-182	185	58-60	177	175	161	178
Chile	32	1	45	103	168	33	44	23	33
China	81	101	88-89	105-106	188	132	139	61	144
Colombia	74	44	82	93-94	1	41	49	51	22
Comoros	146	143	157-160	153-155	79-81	137	165	141	118
Congo	150	142	137-138	151	162	155	122	167	166
Cook Islands	67	92	65	89	45-47	88	61	95	107
Costa Rica	40	45	68	86-87	64-65	45	50	25	36
Côte d'Ivoire	155	181	157-160	153-155	116-120	157	153	133	137
Croatia	38	33	76-79	83	108-111	36	56	57	43
Cuba	33	41	115-117	98-100	23-25	40	118	36	39
Cyprus	25	31	11	44	131-133	28	39	22	24
Czech Republic	35	19	47-48	45-47	71-72	30	40	81	48
Democratic People's Republic of Korea	137	145	139	130-131	179	149	172	153	167
Democratic Republic of the Congo	174	174	142	169-170	169	179	188	185	188
Denmark	28	21	4	3-38	3-5	20	8	65	34
Djibouti	166	169	170	140	3-5	170	163	163	157
Dominica	26	35	84-86	77-78	99-100	42	70	59	35
Dominican Republic	79	97	95	72	154	66	92	42	51
Ecuador	93	133	76-79	182	88	107	97	96	111
Egypt	115	141	102	59	125-127	110	115	43	63
El Salvador	87	115	128	128-129	176	122	83	37	115
Equatorial Guinea	152	151	143	118	134	152	129	174	171
Eritrea	169	167	186	169-170	108-111	176	187	148	158
Estonia	69	43	66	69	145	48	60	115	77
Ethiopia	182	176	179	179-180	138-139	186	189	169	180
Fiji	106	71	57-58	73-74	54-55	78	87	124	96
Finland	20	27	19	3-38	8-11	22	18	44	31
France	3	12	16-17	3-38	26-29	6	4	4	1
Gabon	144	136	118-119	101-102	84-86	141	95	143	139
Gambia	143	155	165-167	157	149	153	158	109	146
Georgia	44	61	165-167	141	105-106	76	125	84	114
Germany	22	20	5	3-38	6-7	14	3	41	25
Ghana	149	149	132-135	146	74-75	139	166	158	135
Greece	7	6	36	3-38	41	23	30	11	14
Grenada	49	82	63-64	84-85	147	68	67	49	85
Guatemala	129	106	115-117	159	157	113	130	99	78
Guinea	167	166	168-169	130-131	76-78	172	159	160	161
Guinea-Bissau	170	177	184	174	122-123	180	156	156	176
Guyana	98	126	114	105-106	45-47	116	109	104	128
Haiti	153	152	157-160	172-173	163	145	155	139	138
Honduras	92	119	129	163	178	129	100	48	131

Member State	ATTAINMENT OF GOALS						PERFORMANCE		
	Health		Responsiveness		Fairness in financial contribution	Overall goal attainment	Health expenditure per capita in international dollars	On level of health	Overall health system performance
	Level (DALE)	Distribution	Level	Distribution					
Hungary	62	40	62	58	105-106	43	59	105	66
Iceland	19	24	15	3-38	12-15	16	14	27	15
India	134	153	108-110	127	42-44	121	133	118	112
Indonesia	103	156	63-64	70	73	106	154	90	92
Iran, Islamic Republic of	96	113	100	93-94	112-113	114	94	58	93
Iraq	126	130	103-104	114	56-57	124	117	75	103
Ireland	27	13	25	3-38	6-7	25	25	32	19
Israel	23	7	20-21	3-38	38-40	24	19	40	28
Italy	6	14	22-23	3-38	45-47	11	11	3	2
Jamaica	36	87	105-107	73-74	115	69	89	8	53
Japan	1	3	6	3-38	8-11	1	13	9	10
Jordan	101	83	84-86	53-57	49-50	84	98	100	83
Kazakhstan	122	52	90-91	60-61	167	62	112	135	64
Kenya	162	135	144	142	79-81	142	152	178	140
Kiribati	125	121	120-121	122	16	123	103	144	142
Kuwait	68	54	29	3-38	30-32	46	41	68	45
Kyrgyzstan	123	122	124	96	171	135	146	134	151
Lao People's Democratic Republic	147	147	145-147	143-144	159	154	157	155	165
Latvia	82	56	69-72	53-57	164-165	67	77	121	105
Lebanon	95	88	55	79-81	101-102	93	46	97	91
Lesotho	171	164	145-147	148-149	89-95	173	123	186	183
Liberia	181	191	175-176	176	84-86	187	181	176	186
Libyan Arab Jamahiriya	107	102	57-58	76	12-15	97	84	94	87
Lithuania	63	48	80-81	45-47	131-133	52	71	93	73
Luxembourg	18	22	3	3-38	2	5	5	31	16
Madagascar	172	168	168-169	179-180	116-120	167	190	173	159
Malawi	189	187	162	152	89-95	182	161	187	185
Malaysia	89	49	31	62	122-123	55	93	86	49
Maldives	130	134	98-99	101-102	51-52	128	76	147	147
Mali	183	180	187-188	187	150-151	178	179	170	163
Malta	21	38	43-44	3-38	42-44	31	37	2	5
Marshall Islands	121	120	98-99	134-135	20-22	119	80	140	141
Mauritania	158	163	165-167	123	153	169	141	151	162
Mauritius	78	77	56	3-38	124	90	69	113	84
Mexico	55	65	53-54	108-109	144	51	55	63	61
Micronesia, Federated States of	104	112	112	128-129	23-25	111	81	110	123
Monaco	9	30	14	3-38	42-44	18	12	12	13
Mongolia	131	148	46	91	97	136	145	138	145
Morocco	110	111	151-153	67-68	125-127	94	99	17	29
Mozambique	180	190	189-190	175	38-40	185	160	168	184
Myanmar	139	162	151-153	158	190	175	136	129	190
Namibia	136	173	113	156	125-127	165	66	189	168
Nauru	136	51	42	39-42	17-19	75	42	166	98
Nepal	142	161	185	166-167	186	160	170	98	150
Netherlands	13	15	9	3-38	20-22	8	9	19	17
New Zealand	31	16	22-23	3-38	23-25	26	20	80	41
Nicaragua	117	96	140	139	164-165	101	104	74	71
Niger	190	184	189-190	184	160-161	188	185	177	170
Nigeria	163	188	149	177	180	184	176	175	187
Niue	85	100	126	145	35-36	102	127	108	121
Norway	15	4	7-8	3-38	8-11	3	16	18	11
Oman	72	59	83	49	56-57	59	62	1	8
Pakistan	124	183	120-121	115	62-63	133	142	85	122
Palau	112	66	52	39-42	30-32	63	47	125	82
Panama	47	93	59	88	76-78	70	53	67	95
Papua New Guinea	145	157	150	119	71-72	150	137	146	148
Paraguay	71	57	97	133	177	73	91	52	57
Peru	105	103	172	161	184	115	78	119	129
Philippines	113	50	49	48	128-130	54	124	126	60
Poland	45	5	50	65	150-151	34	58	89	50
Portugal	29	34	38	53-57	58-60	32	28	13	12
Qatar	66	55	26-27	3-38	70	47	27	53	44
Republic of Korea	51	37	35	43	53	35	31	107	58
Republic of Moldova	88	64	123	107	148	91	108	106	101
Romania	80	78	73-74	67-68	79-81	72	107	111	99
Russian Federation	91	69	69-72	86-87	185	100	75	127	130
Rwanda	185	185	145-147	143-144	58-60	171	177	181	172
Saint Kitts and Nevis	86	91	53-54	3-38	136-137	98	51	122	100
Saint Lucia	54	86	84-86	82	66-67	87	86	54	68
Saint Vincent and the Grenadines	43	89	103-104	98-100	99-100	92	90	38	74
Samoa	97	81	80-81	98-100	33-34	82	121	131	119
San Marino	11	9	32	3-38	30-32	21	21	5	3
Sao Tome and Principe	132	139	148	126	66-67	138	167	117	133
Saudi Arabia	58	70	67	50-52	37	61	63	10	26
Senegal	151	105	118-119	104	87	118	143	132	59
Seychelles	108	73	75	75	64-65	83	52	83	56
Sierra Leone	191	186	173	186	191	191	183	183	191

Member State	ATTAINMENT OF GOALS						Health expenditure per capita in international dollars	PERFORMANCE	
	Health		Responsiveness		Fairness in financial contribution	Overall goal attainment		On level of health	Overall health system performance
	Level (DALE)	Distribution	Level	Distribution					
Singapore	30	29	20-21	3-38	101-102	27	38	14	6
Slovakia	42	39	60	63-64	96	39	45	88	62
Slovenia	34	23	37	53-57	82-83	29	29	62	38
Solomon Islands	127	117	132-135	120	17-19	108	134	20	80
Somalia	173	179	191	190	136-137	189	191	154	179
South Africa	160	128	73-74	147	142-143	151	57	182	175
Spain	5	11	34	3-38	26-29	19	24	6	7
Sri Lanka	76	80	101	77-78	76-78	80	138	66	76
Sudan	154	159	164	148-149	160-161	148	169	149	134
Suriname	77	94	87	79-81	172	105	72	77	110
Swaziland	164	140	108-110	110	156	164	116	184	177
Sweden	4	28	10	3-38	12-15	4	7	21	23
Switzerland	8	10	2	3-38	38-40	2	2	26	20
Syrian Arab Republic	114	107	69-72	79-81	142-143	112	119	91	108
Tajikistan	120	124	125	136	112-113	127	126	145	154
Thailand	99	74	33	50-52	128-130	57	64	102	47
The former Yugoslav Republic of Macedonia	64	85	111	95	116-120	89	106	69	89
Togo	159	170	155	162	152	156	180	159	152
Tonga	75	84	61	97	108-111	85	73	114	116
Trinidad and Tobago	57	75	141	108-109	69	56	65	79	67
Tunisia	90	114	94	60-61	108-111	77	79	46	52
Turkey	73	109	93	66	49-50	96	82	33	70
Turkmenistan	128	131	88-89	113	121	130	128	152	153
Tuvalu	119	116	132-135	153-155	26-29	120	151	128	136
Uganda	186	138	187-188	165	128-130	162	168	179	149
Ukraine	70	47	96	63-64	140-141	60	111	101	79
United Arab Emirates	50	62	30	1	20-22	44	35	16	27
United Kingdom	14	2	26-27	3-38	8-11	9	26	24	18
United Republic of Tanzania	176	172	157-160	150	48	158	174	180	156
United States of America	24	32	1	3-38	54-55	15	1	72	37
Uruguay	37	68	41	53-57	35-36	50	33	50	65
Uzbekistan	100	144	105-107	71	131-133	109	120	112	117
Vanuatu	135	127	127	132	62-63	134	132	120	127
Venezuela, Bolivarian Republic of	52	76	69-72	92	98	65	68	29	54
Viet Nam	116	104	51	121	187	140	147	130	160
Yemen	141	165	180	189	135	146	182	82	120
Yugoslavia	46	90	115-117	116	158	95	113	47	106
Zambia	188	171	132-135	171	155	174	148	190	182
Zimbabwe	184	98	122	166-167	175	147	110	191	155

Source: Annex Tables 5-10.

CHAPTER TWO

How Well do Health Systems Perform?

Better health is unquestionably the primary goal of a health system. But because health care can be catastrophically costly and the need for it unpredictable, mechanisms for sharing risk and providing financial protection are important. A second goal of health systems is therefore fairness in financial contribution. A third goal – responsiveness to people's expectations in regard to non-health matters – reflects the importance of respecting people's dignity, autonomy and the confidentiality of information. WHO has engaged in a major exercise to obtain and analyse data in order to assess how far health systems in WHO Member States are achieving these goals for which they should be accountable, and how efficiently they are using their resources in doing so. By focusing on a few universal functions that health systems undertake, this report provides an evidence base to assist policy-makers improve health system performance.

2

How Well do Health Systems Perform?

Attainment and performance

Assessing how well a health system does its job requires dealing with two large questions. The first is how to measure the outcomes of interest – that is, to determine what is achieved with respect to the three objectives of good health, responsiveness and fair financial contribution (*attainment*). The second is how to compare those attainments with what the system *should* be able to accomplish – that is, the best that could be achieved with the same resources (*performance*). Although progress is feasible against many of society's health problems, some of the causes lie completely outside even a broad notion of what health systems are. Health systems cannot be held responsible for influences such as the distribution of income and wealth, any more than for the impact of the climate. But avoidable deaths and illness from childbirth, measles, malaria or tobacco consumption can properly be laid at their door. A fair judgement of how much health damage it should be possible to avoid requires an estimate of the best that can be expected, and of the least that can be demanded, of a system. The same is true of progress towards the other two objectives, although much less is known about them *(1)*.

Goals and functions

Better health is of course the *raison d'être* of a health system, and unquestionably its primary or defining goal: if health systems did nothing to protect or improve health there would be no reason for them. Other systems in society may contribute greatly to the population's health, but not as their primary goal. For example, the education system makes a large difference to health, but its defining goal is to educate. Influence also flows the other way: better health makes children better able to learn, but that is not the defining purpose of the health system. In contrast, the goal of fair financing is common to all societal systems. This is obvious when the system is paid for socially, but it holds even when everything is financed purely by individual purchases. It is only the notion of fairness that may vary. "Getting what you pay for" is generally accepted as fair in market transactions, but seems much less fair where health services are concerned. Similarly, in any system, people have expectations which society regards as legitimate, as to how they should be treated, both physically and psychologically. Responsiveness is therefore always a social goal. Taking the education system as an example, fair financing means the right balance of contributions from households which do and those which do not have children in school, and enough subsidy that poor children are not denied schooling for financial reasons. Responsiveness includes respect for parents' wishes for their children, and avoiding abuse or humiliation of the students themselves.

The health system differs from other social systems such as education, and from the markets for most consumer goods and services, in two ways which make the goals of fair financing and responsiveness particularly significant. One is that health care can be catastrophically costly. Much of the need for care is unpredictable, so it is vital for people to be protected from having to choose between financial ruin and loss of health. Mechanisms for sharing risk and providing financial protection are more important even than in other cases where people buy insurance, as for physical assets like homes or vehicles, or against the financial risk to the family of a breadwinner dying young. The other peculiarity of health is that illness itself, and medical care as well, can threaten people's dignity and their ability to control what happens to them more than most other events to which they are exposed. Among other things, responsiveness means reducing the damage to one's dignity and autonomy, and the fear and shame that sickness often brings with it.

Systems are often charged to be affordable, equitable, accessible, sustainable, of good quality, and perhaps to have many other virtues as well. However, desiderata such as accessibility are really a means to an end; they are instrumental rather than final goals. The more accessible a system is, the more people should utilize it to improve their health. In contrast, the goals of health, fair financing, and responsiveness are each intrinsically valuable. Raising the achievement of any goal or combination of goals, without lowering the attainment of another, represents an improvement. So if the achievement of these goals can be measured, then instrumental goals such as accessibility become unnecessary as proxy measures of overall performance; they are relevant rather as explanations of good or bad outcomes.

It is certainly true that financing that is more fairly distributed may contribute to better health, by reducing the risk that people who need care do not get it because it would cost too much, or that paying for health care leaves them impoverished and exposed to more health problems. And a system that is more responsive to what people want and expect can also make for better health, because potential patients are more likely to utilize care if they anticipate being treated well. Both goals therefore are partly instrumental, in that they promote improvements in health status. But they would be valuable even if that did not happen. That is, paying equitably for the system is a good thing in itself. So is assuring that people are treated promptly, with respect for their dignity and their wishes, and that patients receive adequate physical and affective support while undergoing treatment. The three goals are separable, as is often shown by people's unhappiness with a system even when the health outcomes are satisfactory.

Comparing how health systems perform means looking at what they achieve and at what they *do* – how they carry out certain *functions* – in order to achieve anything *(2)*. These functions could be classified and related to system objectives in many different ways. For example, the "Public health in the Americas" initiative led by the Pan American Health Organization describes 12 different "essential functions", and proposes between three and six sub-functions for each one *(3)*. Many of these functions correspond to the task of stewardship which this report emphasizes, others to service provision and to resource generation. The four functions described in this chapter embrace these and other more specific activities. Figure 2.1 indicates how these functions – delivering personal and non-personal health services; raising, pooling and allocating the revenues to purchase those services; investing in people, buildings and equipment; and acting as the overall stewards of the resources, powers and expectations entrusted to them – are related to one another and to the objectives of the system. Stewardship occupies a special place because it involves oversight of all the other functions, and has direct or indirect effects on all the outcomes. Comparing the way these functions are actually carried out provides a basis for understanding

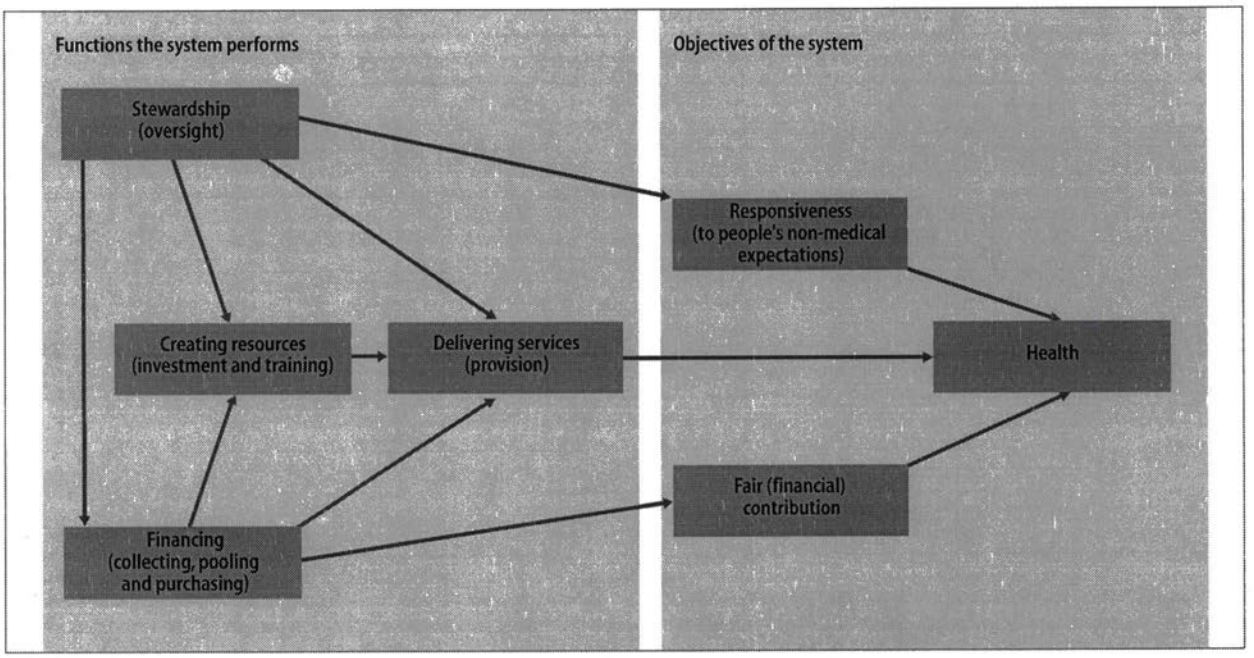
performance variations over time and among countries. Some evidence about these functions, and how they influence the attainment of the fundamental objectives in different health systems, is examined in the next four chapters.

In the view of most people, the health system is simply those providers and organizations which deliver personal medical services. Defining the health system more broadly means that the people and organizations which deliver medical care are not the whole system; rather, they exercise one of the principal functions of the system. They also share, sometimes appropriately and sometimes less so, in the other functions of financing, investment and stewardship. The question of who should undertake which functions is one of the crucial issues treated in later chapters.

It is common to describe the struggle for good health in quasi-military terms, to talk of "fighting" malaria or AIDS, to refer to a "campaign" of immunization or the "conquest" of smallpox, to "free" a population or a geographical area of some disease, to worry about the "arms race" that constantly occurs between pathogens and the drugs to hold them in check, to hope for a "silver bullet" against cancer or diabetes. In those terms, the providers of direct health services – whether aimed at individuals, communities or the environment – can be considered the front-line troops defending society against illness. But just as with an army, the health system must be much more than the soldiers in the field if it is to win any battles. Behind them is an entire apparatus to ensure that the fighters are adequately trained, informed, financed, supplied, inspired and led. It is also crucial to treat decently the population they are supposed to protect, to teach the "civilians" in the struggle how to defend themselves and their families, and to share equitably the burden of financing the war.

Unless those functions are properly carried out, firepower will be much less effective than it might be, and casualties will be higher. The emphasis here on overall results and on the functions more distant from the front line does not mean any denigration of the importance of disease control. It means rather to step back and consider what it is that the system as a whole is trying to do, and how well it is succeeding. Success means, among other things, more effective control of diseases, through better performance.

Figure 2.1 Relations between functions and objectives of a health system



GOODNESS AND FAIRNESS: BOTH LEVEL AND DISTRIBUTION MATTER

A good health system, above all, contributes to good health. But it is not always satisfactory to protect or improve the average health of the population, if at the same time inequality worsens or remains high because the gain accrues disproportionately to those already enjoying better health. The health system also has the responsibility to try to reduce inequalities by preferentially improving the health of the worse-off, wherever these inequalities are caused by conditions amenable to intervention. The objective of good health is really twofold: the best attainable average level – *goodness* – and the smallest feasible differences among individuals and groups – *fairness*. A gain in either one of these, with no change in the other, constitutes an improvement, but the two may be in conflict. The logic is somewhat parallel to that concerning the distribution of income in a population. It is desirable to raise the average level, to reduce inequality, or both, and sometimes to judge the relative values of one and the other goal (with the difference that there is no argument for taking health away from anyone – health, unlike income or nonhuman assets, cannot be directly redistributed).

The distinction between the overall level and how it is distributed in the population also applies to responsiveness. Goodness means the system responds well on average to what people expect of it, with respect to its non-health aspects. Fairness means that it responds equally well to everyone, without discrimination or differences in how people are treated. The distribution of responsiveness matters, just as the distribution of health does. Either one is valuable by itself.

In contrast to the objectives of good health and responsiveness, there is no overall notion of goodness related to financing. There are good and bad ways to raise the resources for a health system, of course, but they are more or less good primarily as they affect how fairly the financial burden is shared. Fair financing, as the name suggests, is concerned only with distribution. It is not related to the total resource bill, nor to how the funds are used. While it is unambiguously preferable to have better health or a higher level of responsiveness, it is not always better to spend more on health because at high levels of expenditure there may be little additional health gain from more resources. The objectives of the health system do not include any particular level of total spending, either absolutely or relative to income. This is because, at all levels of spending, the resources devoted to health have competing uses, and it is a social choice – with no correct answer – how much to allocate to the health system. Nonetheless there is probably a minimum level of expenditure required to provide a whole population with a handful of the most cost-effective services, and many poor countries are currently spending too little even to assure that *(4)*.

In countries where most health financing is private, and is largely out of pocket, no one makes this choice overall; it results from millions of individual decisions. As the level of prepayment rises, there are fewer and larger decisions, because spending is more and more determined by the policies and budgets of public entities and insurance funds. The public budget decision has the greatest effect in high income countries where most funding is government controlled or mandated, but in all countries it is one of the most basic public decisions. It is something that can be directly chosen, as the level of health outcome or of responsiveness cannot be.

MEASURING GOAL ACHIEVEMENT

To assess a health system, one must measure five things: the overall level of health; the distribution of health in the population; the overall level of responsiveness; the distribution of responsiveness; and the distribution of financial contribution. For each one, WHO has used existing sources or newly generated data to calculate measures of attainment for the countries where information could be obtained. These data were also used to estimate values when particular numbers were judged unreliable, and to estimate attainment and performance for all other Member States. Several of these measures are novel and are explained in detail in the Statistical Annex, where all the estimates are given, along with intervals expressing the uncertainty or degree of confidence in the point estimate. The correct value for any indicator is estimated to have an 80% probability of falling within the uncertainty interval, with chances of 10% each of falling below the low value or above the high one. This recognition of inexactness underscores the importance of getting more and better data on all the basic indicators of population health, responsiveness and fairness in financial contribution, a task which forms part of WHO's continuing programme of work.

The achievements with respect to each objective are used to rank countries, as are the overall measures of achievement and performance described below. Since a given country or health system may have very different ranks on different attainments, Annex Table 1 shows the complete ranking for all Member States on all the measures. In several subsequent tables, countries are ranked in order of achievement or performance, and the order varies from one table to another. Since the ranking is based on estimates which include uncertainty as to the exact values, the rank assigned also includes uncertainty: a health system is not always assigned a specific position relative to all others but is estimated to lie somewhere within a narrower or broader range, depending on the uncertainties in the calculation. The ranks of different health systems therefore sometimes overlap to a greater or lesser degree, and two or more countries may have the same rank.

Health is the defining objective for the health system. This means making the health status of the entire population as good as possible over people's whole life cycle, taking account of both premature mortality and disability. Annex Table 2 presents three conventional and partial measures of health status, by country, without ranking: these are the probability of dying before age five years or between ages 15 and 59 years, and life expectancy at birth. For the first time, these measures are presented with estimates of uncertainty, and these uncertainties carry over to subsequent calculations. On the basis of the mortality figures, five strata are identified, ranging from low child and adult mortality to high child mortality and very high adult death rates. Combining these strata with the six WHO Regions gives 14 subregions defined geographically and epidemiologically (see the list of Member States by WHO Region and mortality stratum). Annex Table 3 presents estimates of mortality by cause and sex in 1999 in each of these subregions (not by country), and Annex Table 4 combines these death rates with information about disability to create estimates of one measure of overall population health: the burden of disease, that is, the numbers of disability-adjusted life years (DALYs) lost.

To assess overall population health and thus to judge how well the objective of good health is being achieved, WHO has chosen to use disability-adjusted life expectancy (DALE), which has the advantage of being directly comparable to life expectancy estimated from mortality alone and is readily compared across populations. Annex Table 5 provides estimates for all countries of disability-adjusted life expectancy. DALE is estimated to equal or exceed 70 years in 24 countries, and 60 years in over half the Member States of WHO. At

the other extreme are 32 countries where disability-adjusted life expectancy is estimated to be less than 40 years. Many of these are countries with major epidemics of HIV/AIDS, among other causes. Box 2.1 describes how these summary measures of population health are constructed and how they are related.

Figure 2.2 summarizes the relation between DALE and life expectancy without adjustment, for each of the 14 subregions, for both men and women. The adjustment is nearly uniform, at about seven years of healthy life equivalent lost to disability. Both absolutely and relatively this loss is slightly less for richer, low-mortality subregions, despite the fact that people live longer there and so have more opportunity to acquire non-fatal disabilities. Disability makes a substantial difference in poorer countries because some limitations – injury, blindness, paralysis and the debilitating effects of several tropical diseases such as malaria and shistosomiasis – strike children and young adults. Separating life expectancy into years in good health and years lived with disability therefore widens rather than narrows the difference in health status between richer and poorer populations. This is most evident in the share of life expectancy which is lost to disability: it ranges from less than 9% in the healthiest subregions to more than 14% in the least healthy. Annex Table 5 shows these shares for individual countries, where the range is even wider.

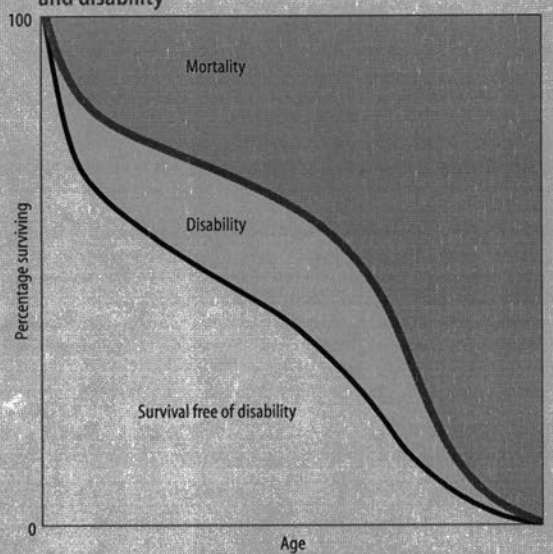
Annex Table 5 also provides estimates of health inequality. The distributional measure of health ranges from 1 for the case of perfect equality to zero for extreme inequality, which corresponds to a fraction of the population having an expectancy of 100 years and the rest

Box 2.1 Summary measures of population health

No measure is perfect for the purpose of summing up the health of a population; each way of estimating it violates one or another desirable criterion. The two principal approaches are the burden of disease, which measures losses of good health compared to a long life free of disability, and some measure of life expectancy, adjusted to take account of time lived with a disability. Both ways of summarizing health use the same information about mortality and disability, and both are related to a survivorship curve, such as the bold line between the areas labelled *Disability* and *Mortality* in the figure.

The area labelled *Mortality* represents losses due to death, compared to a high standard of life expectancy: the burden of disease corresponds to all of that area plus a fraction of the area corresponding to time lived with disability. The fraction depends on the disability weights assigned to various states between death and perfect health. Life expectancy without any adjustment corresponds to the areas labelled *Survival free of disability* and *Disability* together, the whole area under the survivorship curve. Disability-adjusted life expectancy (DALE) then corresponds to the area for survival plus part of that for disability.

Summarizing population health from mortality and disability



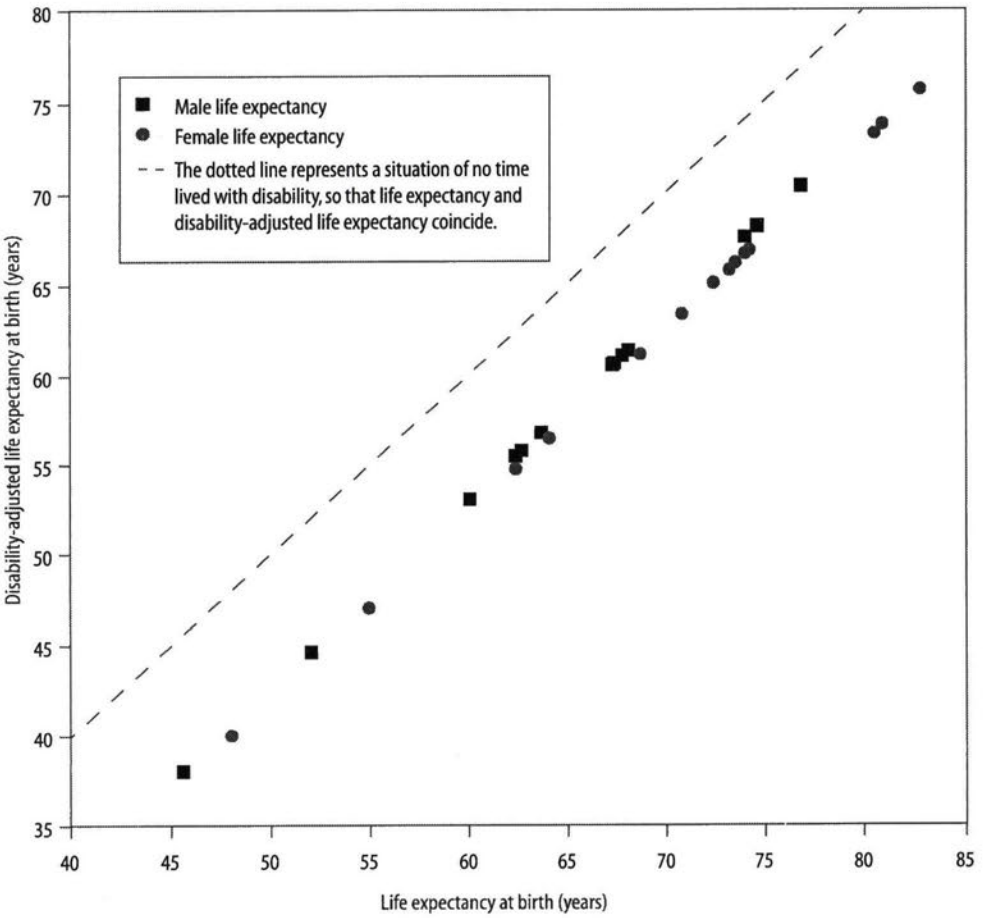
DALE is estimated from three kinds of information: the fraction of the population surviving to each age, calculated from birth and death rates; the prevalence of each type of disability at each age; and the weight assigned to each type of disability, which may or may not vary with age. Survival at each age is adjusted downward by the sum of all the disability effects, each of which is the product of a weight and the complement of a prevalence (the share of the population not suffering that disability). These adjusted survival shares are then divided by the initial population, before any mortality occurred, to give the average number of equivalent healthy life years that a newborn member of the population could expect to live.

One important difference between the burden of disease estimation using disability-adjusted life years (DALYs) and that of DALE is that the former do, but the latter do not, distinguish the contribution of each disease to the overall result. DALE has the advantage that it does not require as many choices of parameters for the calculation, and it is directly comparable to the more familiar notion of life expectancy without adjustment.

Source: Murray CJL, Salomon JA, Mathers C. *A critical examination of summary measures of population health.* Geneva, World Health Organization, 1999 (GPE Discussion paper No. 12).

having no expectation of surviving infancy. *If everyone had the same life expectancy, adjusted for disability, the system would be perfectly fair with respect to health, even though people would actually die at different ages.* For a small number of countries it has been possible to estimate the distribution of life expectancy within the population using information on both child

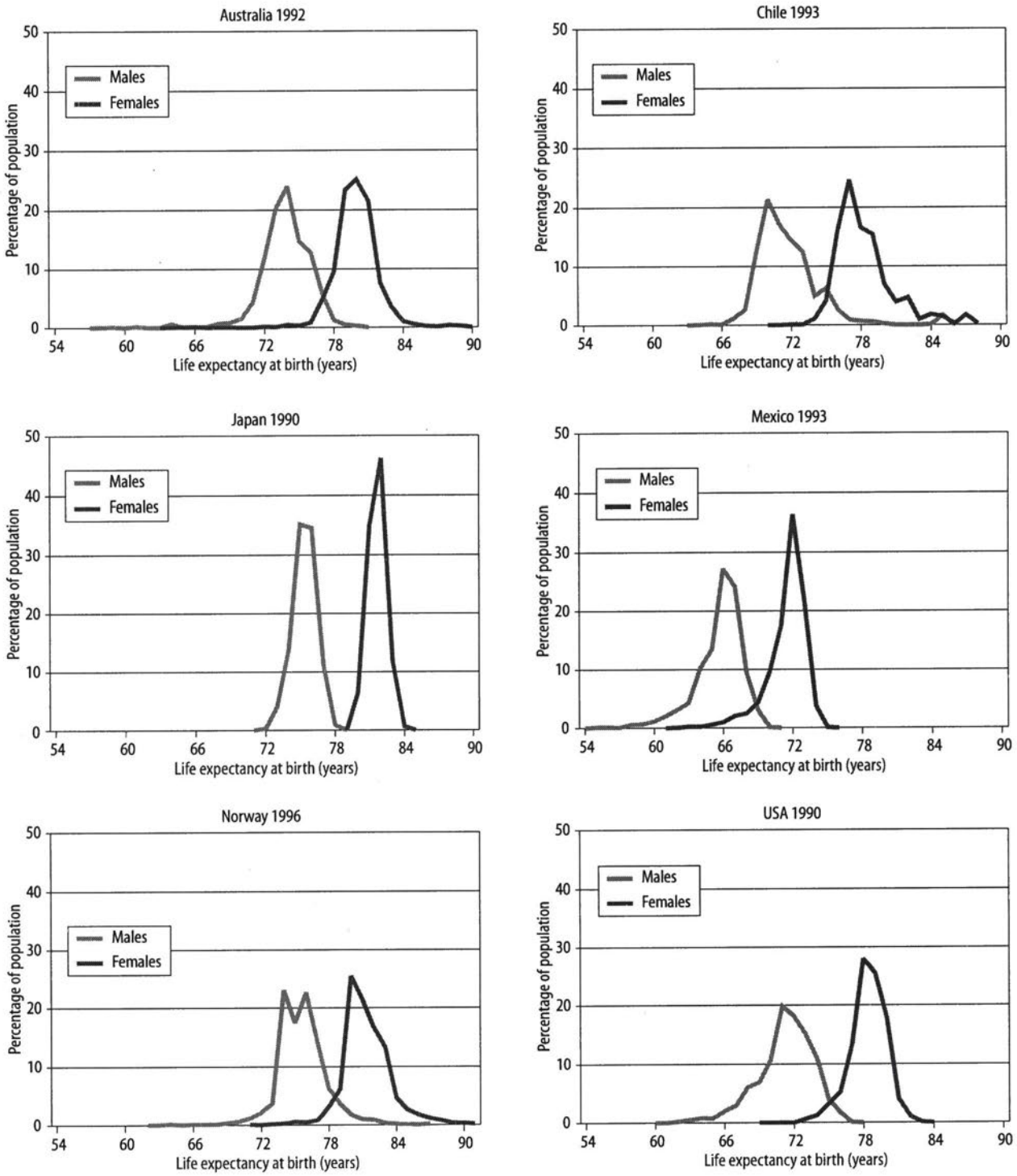
Figure 2.2 Life expectancy and disability-adjusted life expectancy for males and females, by WHO Region and stratum defined by child mortality and adult mortality, 1999



WHO Region	Mortality stratum		Males		Females	
	Child	Adult	Life expectancy	Disability adjusted	Life expectancy	Disability adjusted
AFR	High	High	52.0	44.6	54.9	47.0
	High	Very high	45.6	38.0	48.0	40.0
AMR	Very low	Very low	73.9	67.5	80.4	73.2
	Low	Low	67.3	60.6	74.1	66.8
	High	High	63.6	56.7	68.6	61.1
EMR	Low	Low	67.7	61.0	70.7	63.3
	High	High	60.0	53.0	62.3	54.7
EUR	Very low	Very low	74.5	68.1	80.8	73.7
	Low	Low	67.3	60.6	73.9	66.6
	Low	High	62.3	55.4	73.4	66.1
SEAR	Low	Low	67.2	60.5	73.1	65.7
	High	High	62.6	55.7	64.0	56.4
WPR	Very low	Very low	76.7	70.3	82.7	75.6
	Low	Low	68.0	61.3	72.3	65.0

and adult mortality; these results are presented below. For most countries, however, it has so far been possible to use only child mortality data. Because high-income countries have largely eliminated child mortality, the highest ranking countries in Annex Table 5 nearly all have relatively high incomes; most are European. A few Latin American countries which

Figure 2.3 Inequality in life expectancy at birth, by sex, in six countries



have made great progress in controlling child deaths also show considerable equality of health. Except for Afghanistan and Pakistan, all the countries ranked lowest on child health equality are in sub-Saharan Africa, where child mortality is still relatively high. When more complete data are available on inequalities in adult mortality they will be used in future WHO estimates, and these rankings will change, because high income countries differ more in adult than in child death rates.

Inequalities in life expectancy persist, and are strongly associated with socioeconomic class, even in countries with quite good health status on average *(5)*. Figure 2.3 illustrates these inequalities for six countries, showing the distribution of life expectancy at birth for both men and women, using data on adult as well as child mortality, estimated from large numbers of small-area studies which cover the entire country. Among these six countries, health is most equally distributed in Japan. Both distributions of life expectancy are sharply peaked, concentrating the whole population of either men or women in a range of only about six years. There is far more inequality in Mexico and in the United States, and in both cases that arises because part of the population has a much lower expectation than the rest, after age five years. The inequality is particularly marked for men. An opposite pattern characterizes Chile, which shows very high equality in child health: the degree of adult inequality is about the same as for Mexico and the United States, but it arises because part of the population has an unusually high life expectancy. Australia and Norway both show more symmetric distributions. These results emphasize the value of judging health system achievement not only by averages or overall levels but by seeing whether everyone has about the same expectation of life.

Responsiveness is not a measure of how the system responds to health needs, which shows up in health outcomes, but of how the system performs relative to non-health aspects, meeting or not meeting a population's expectations of how it should be treated by providers of prevention, care or non-personal services. (The last category is least important, since individuals normally do not come into personal contact with such interventions. However, even public health measures such as vector control can be conducted with more or less respect for people and their wishes. Assessing the responsiveness of providers of non-personal services is a particular challenge.)

Some systems are highly unresponsive. The Soviet health system prior to 1990 had become highly impersonal and inhuman in the way it processed people. A common complaint in many countries about public sector health workers focuses on their rudeness and arrogance in relations with patients *(6, 7)*. Waiting times for non-emergency surgery vary considerably among industrialized countries *(8)* and are the subject of much criticism of ministries of health *(9)*. Recognizing responsiveness as an intrinsic goal of health systems establishes that these systems are there to serve people, and involves more than an assessment of people's satisfaction with the purely medical care they receive.

The general notion of responsiveness can be decomposed in many ways. One basic distinction is between elements related to respect for human beings as persons – which are largely subjective and judged primarily by the patient – and more objective elements related to how a system meets certain commonly expressed concerns of patients and their families as clients of health systems, some of which can be directly observed at health facilities. Subdividing these two categories leads to seven distinct elements or aspects of responsiveness.

Respect for persons includes:

- Respect for the dignity of the person. At the extreme, this means not sterilizing individuals with a genetic disorder or locking up people with communicable diseases, which would violate basic human rights. More generally, it means not humiliating or demeaning patients.
- Confidentiality, or the right to determine who has access to one's personal health information.
- Autonomy to participate in choices about one's own health. This includes helping choose what treatment to receive or not to receive.

Client orientation includes:

- Prompt attention: immediate attention in emergencies, and reasonable waiting times for non-emergencies.
- Amenities of adequate quality, such as cleanliness, space, and hospital food.
- Access to social support networks – family and friends – for people receiving care.
- Choice of provider, or freedom to select which individual or organization delivers one's care.

In general, responsiveness contributes to health by promoting utilization, but that is not always the case. Greater autonomy can mean that people do not take up an intervention because they perceive the individual benefit to be small or the risk to be substantial, and do not value the collective or population benefit. This is particularly likely for immunization, especially if there is fear of adverse reactions. Individual freedom to choose whether or not to be immunized is in conflict with the public health objective of high coverage to prevent epidemics. Such conflict has occurred, for example, in the United Kingdom for pertussis and in Greece for rubella vaccine *(10)*. The overall performance of a health system may therefore involve trade-offs among objectives.

Opinions on how well a health system performs on such subjective dimensions as responsiveness might be influenced by any of a number of features of the systems themselves, or of the respondents. Since poor people may expect less than rich people, and be more satisfied with unresponsive services, measures of responsiveness should correct for

Box 2.2 How important are the different elements of responsiveness ?

The key informant survey, consisting of 1791 interviews in 35 countries, yielded scores (from 0 to 10) on each element of responsiveness, as well as overall scores. A second, Internet-based survey of 1006 participants (half from within WHO) generated opinions about the relative importance of the elements, which were used to combine the element scores into an overall score instead of just taking the mean or using the key informants' overall responses.

Respondents were asked to rank the seven elements in order of importance, and the weights were derived from the frequencies with which an element was ranked first, second, and so on. Respect for persons and client orientation were rated as equally important overall, and the three elements of respect for persons were also regarded as all about equally important. The four elements of client orientation received different rankings and therefore unequal weights. The final weights are shown in the table.

Respect for persons	
Total	50%
Respect for dignity	16.7%
Confidentiality	16.7%
Autonomy	16.7%
Client orientation	
Total	50%
Prompt attention	20%
Quality of amenities	15%
Access to social support networks	10%
Choice of provider	5%

Analysis of the element scores themselves, as estimated by the key informants, showed three consistent biases: for the same country, women respondents gave lower scores than men, and government officials gave higher scores than more independent informants; and all informants' scores tended to be higher for countries with less political freedom, as measured by a composite index. The data were adjusted to make the scores comparable across countries by removing the influence of these factors, so that all the scores are estimates of the ratings that would be given in a politically free country, by respondents who did not work for the government, half of whom were women.

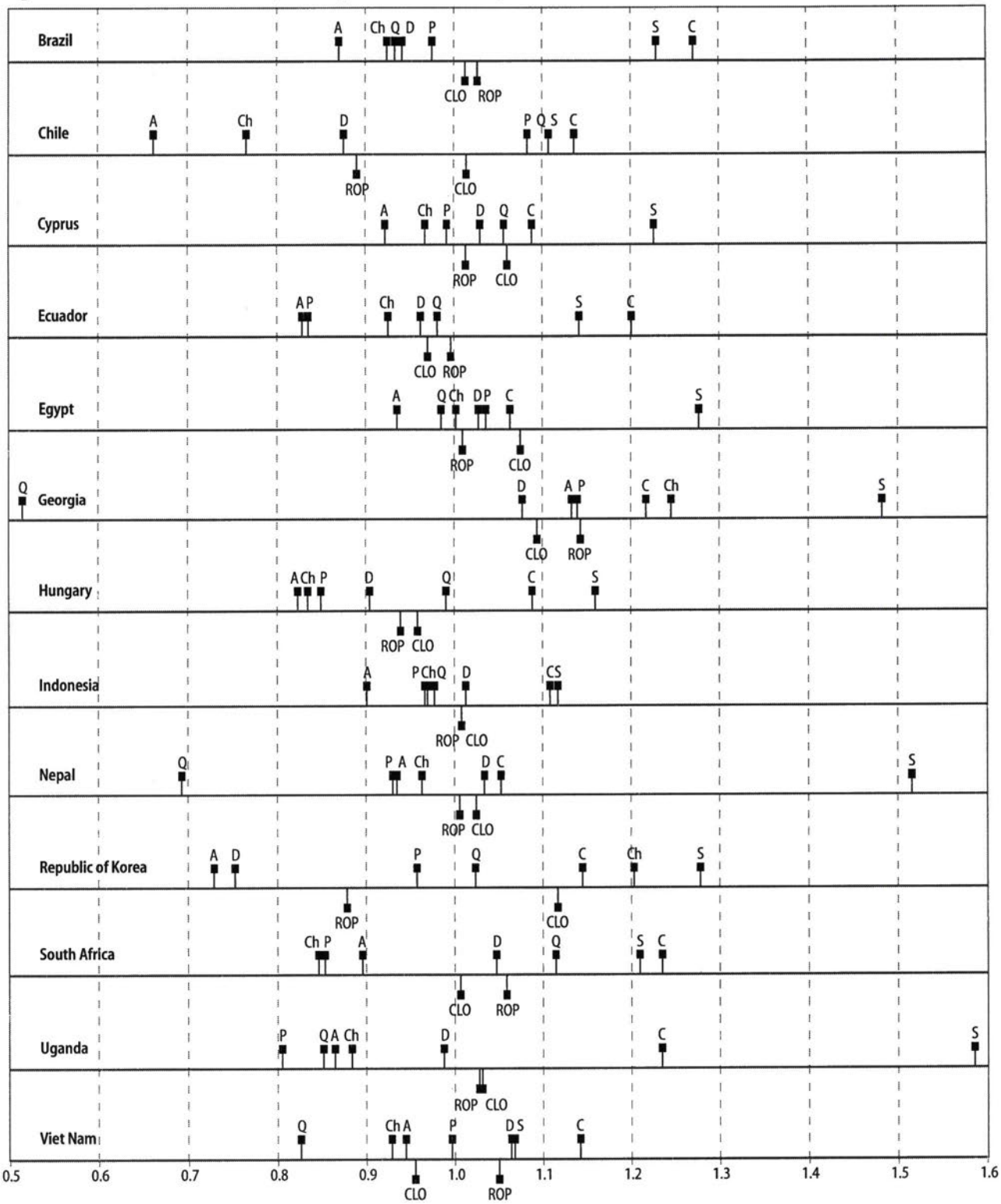
these differences, as well as for cultural differences among countries *(11)*. Even without such adjustment, comparisons of how knowledgeable observers rate health system achievements can reveal on which aspects of responsiveness a system seems to satisfy its users best. Judgements about average level and inequality of the components of responsiveness were developed in each of 35 countries by a network of 50 or more key informants. A separate survey of over a thousand respondents was used to develop weights for combining these scores into an overall rating. Box 2.2 describes the results of this exercise. Estimates for other Member States were derived from the 35 observations, adjusted for differences among countries and informant groups. Surveys of population opinion and direct observation of health provision can both be used to complement these judgements.

Figure 2.4 illustrates in detail the scores of the seven individual elements, relative to the overall score, within each of 13 countries chosen to reflect all WHO Regions and typical of the entire set of countries studied. The health systems examined always appear to perform relatively well on the two dimensions of access to social support networks and confidentiality, sometimes very much better than on other aspects. The systematically high rating for social support may reflect a trade-off against the quality of amenities, because a health care facility that cannot, for lack of resources, offer good quality food or non-medical attention can compensate for that by allowing relatives and friends to attend to patients' needs. One reason why confidentiality seems not to be a problem in these countries may be that there is little private insurance and therefore little risk of coverage being denied because a provider reveals some information about a patient. There is somewhat less consistency at the other end of the scale, but autonomy is among the three lowest-rated elements of responsiveness 34 times out of 35 – and the lowest ranked element almost half the time – and performance is also often poor with respect to choice of provider and promptness of care.

As with health status, it is not only overall responsiveness that matters, if some people are treated with courtesy while others are humiliated or disdained. *A perfectly fair health system would make no such distinctions, and would receive the same rating of responsiveness on every element, for every group in the population.* In almost every country where key informants were surveyed, the poor were identified as the main disadvantaged group. In particular, they were considered to be treated with less respect for their dignity, to have less choice of providers and to be offered poorer quality amenities than the non-poor. In nearly as many cases, rural populations – among whom the poor are concentrated – were regarded as being treated worse than urban dwellers, suffering especially from less prompt attention, less choice of providers and lower quality of amenities. Some respondents in one or several countries also identified women, children or adolescents, indigenous or tribal groups or others as receiving worse treatment than the rest of the population.

The elements of client orientation, where the poor and the rural population are less well treated, all have economic implications: it generally costs more to assure quick attention and to offer high quality food, more space and well-kept facilities. It also makes cost control harder if people are allowed to choose their providers, and costs differ among them. The strongest associations occur for quality of basic amenities and promptness of attention. The former is closely related to income per head and to the share of private expenditure in total health spending; the latter is closely related to average years of schooling of the population, which is also associated with income. In contrast, the elements of respect for persons can be costless, apart perhaps from some training of providers and administrators. These elements – respect for dignity, autonomy, and confidentiality – show no relation to health system spending. There is scope for improving health system performance in these respects without taking any resources away from the primary objective of better health. This

Figure 2.4 Relative scores of health system responsiveness elements, in 13 countries, 1999



All scores are normalized relative to the average overall country responsiveness score = 1.
A = autonomy, C = confidentiality, Ch = choice of provider or facility, D = dignity, P= promptness, Q = quality of basic amenities, S = access to social support networks, ROP = respect of persons, CLO = client orientation.

is particularly the case for autonomy, where performance is often poorly rated.

Annex Table 6 reports adjusted scores for overall responsiveness, as well as a measure of fairness based on the informants' views as to which groups are most often discriminated against in a country's population and on how large those groups are. Either a larger group being affected, or more informants agreeing on that group's being treated worse than some others, implies more inequality of responsiveness and therefore less achievement of fairness. Since some elements of responsiveness are costly, it is not surprising that most of the highest ranked countries spend relatively large amounts on health. They are also often countries where a large share of provision is private, even if much of the financing for it is public or publicly mandated. However, the association with a country's income or health expenditure is less marked than it is for health status. Several poor African and Asian countries rank fairly high on the level of responsiveness. And countries that perform well on average for responding to people's expectations may nonetheless rank much lower on the distributional index.

Fair financing in health systems means that the risks each household faces due to the costs of the health system are distributed according to ability to pay rather than to the risk of illness: a fairly financed system ensures financial protection for everyone. A health system in which individuals or households are sometimes forced into poverty through their purchase of needed care, or forced to do without it because of the cost, is unfair. This situation characterizes most poorer countries and some middle and high income ones, in which at least part of the population is inadequately protected from financial risks *(12)*.

Paying for health care can be unfair in two different ways. It can expose families to large *unexpected* expenses, that is, costs that could not be foreseen and have to be paid out of pocket at the moment of utilization of services rather than being covered by some kind of prepayment. Or it can impose *regressive* payments, in which those least able to contribute pay proportionately more than the better-off. The first problem is solved by minimizing the share of out-of-pocket financing of the system, so as to rely as fully as possible on more predictable prepayment that is unrelated to illness or utilization. The second is solved by assuring that each form of prepayment – through taxes of all kinds, social insurance, or voluntary insurance – is progressive or at least neutral with respect to income, being related to capacity to pay rather than to health risk.

Out-of-pocket payments are generally regressive but they can, in principle, be neutral or progressive. When this happens, and out-of-pocket expenses are not too large, they need not impoverish anyone or deter the poor from obtaining care. However, of all the forms of financing they are the most difficult to make progressive. Arrangements that exempt the destitute from user fees at public facilities, or impose a sliding scale based on socioeconomic characteristics, are attempts to reduce the risk associated with out-of-pocket payments *(13, 14)*. Except when private practitioners know their clientele well enough to discriminate among them in fees – and the better-off accept that their charges will subsidize the worse-off – such arrangements are limited to public facilities, which often account for only a small share of utilization in poor countries. And even then, such schemes require relatively high administrative costs to distinguish among users, and typically affect only a small amount of total risk-related payments.

For this reason, financial fairness is best served by more, as well as by more progressive, prepayment in place of out-of-pocket expenditure. And the latter should be small not only in the aggregate, but relative to households' ability to pay. Prepayment that is closely related to *ex ante* risk, as judged from observable characteristics – risk-related insurance premiums,

for example – is still preferable to out-of-pocket payment because it is more predictable, and may be justified to the extent that the risks are under a person's control. However, the ideal is largely to disconnect a household's financial contribution to the health system from its health risks, and separate it almost entirely from the use of needed services. The question of how far insurance prepayments may be related to risks, and how such premiums should be financed, including subsidies for those unable to pay, is treated in Chapter 5.

Ex post, the burden of health financing on a particular household is the share that its actual health expenses are of its capacity to pay. The numerator includes all costs attributable to the household, including those it is not even aware of paying, such as the share of sales or value-added taxes it pays on consumption, which governments then devote to health, and the contribution via insurance provided, and partly financed, by employers.

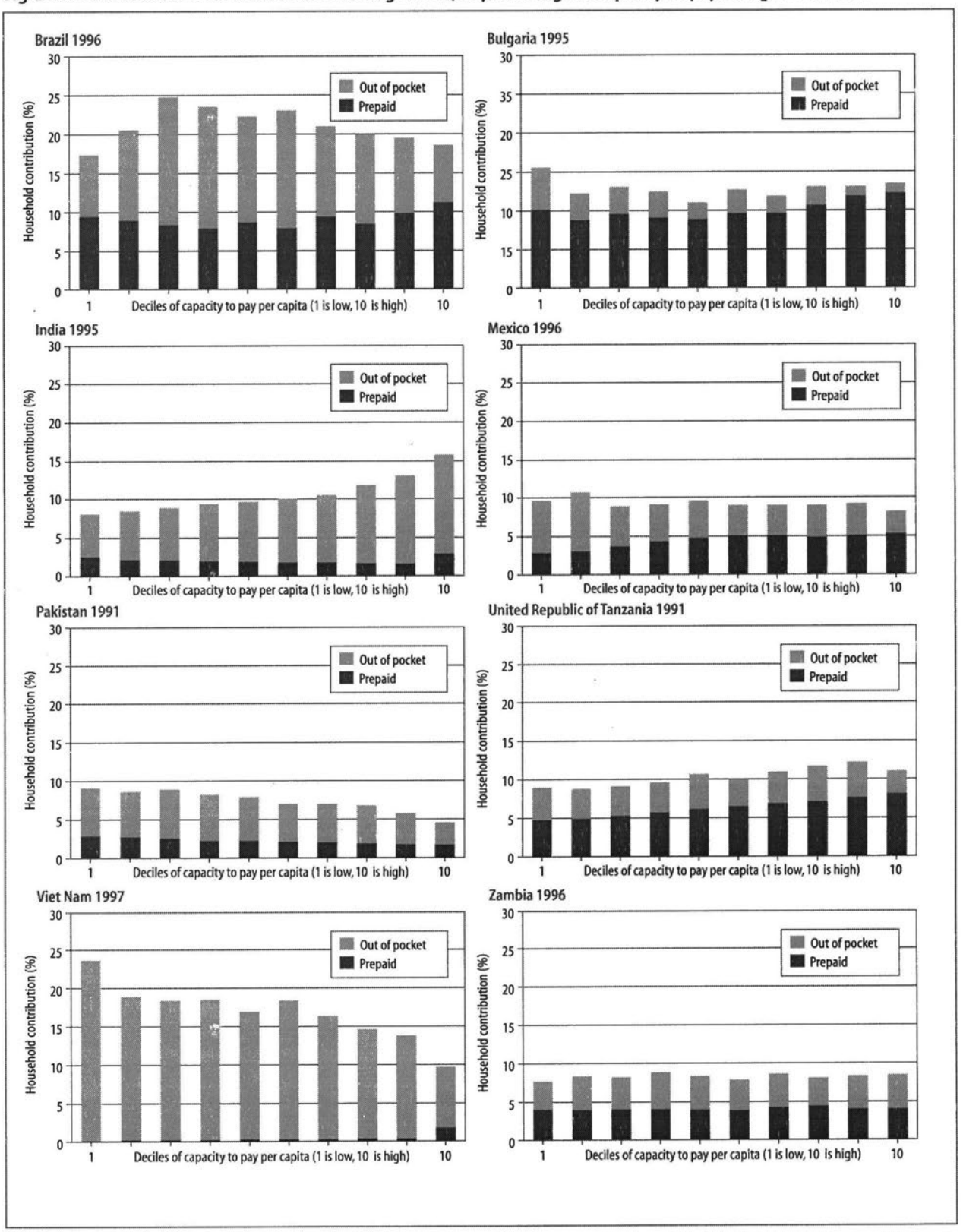
The denominator is a measure of the household's capacity to pay. In poor households, a large share goes for basic necessities, particularly food, whereas richer households have more margin for other spending, including spending on health care. Food spending is treated as an approximation to expenditure on basic needs. Total non-food spending is taken as an approximation of the household's discretionary and relatively permanent income, which is less volatile than recorded income *(15)* and a better measure of what a household can afford to spend on health and other non-food needs.

In sum, *the way health care is financed is perfectly fair if the ratio of total health contribution to total non-food spending is identical for all households, independently of their income, their health status or their use of the health system.* This indicator expresses the trenchant view of Aneurin Bevan, that "The essence of a satisfactory health service is that the rich and the poor are treated alike, that poverty is not a disability, and wealth is not advantaged." *(16)*. Clearly the financing would be unfair if poor households spent a larger share than rich ones, either because they were less protected by prepayment systems and so had to pay relatively more out of pocket, or because the prepayment arrangements were regressive. But to identify fairness with equality means that the system is also regarded as unfair if *rich* households pay more, as a share of their capacity. Simply by paying the same fraction as poor households, they would be subsidizing those with lower capacity to pay. It is true that well-off households might choose to pay still more, particularly by buying more insurance, but that can be considered equitable only if the extra spending is prepaid and if the choice is entirely voluntary and not determined by the system of taxes or mandatory insurance contributions.

Families that spend 50% or more of their non-food expenditure on health are likely to be impoverished as a result. Detailed household surveys show that in Brazil, Bulgaria, Jamaica, Kyrgyzstan, Mexico, Nepal, Nicaragua, Paraguay, Peru, the Russian Federation, Viet Nam and Zambia more than 1% of all households had to spend on health half or more of their full monthly capacity to pay, which means that in large countries millions of families are at risk of impoverishment. Invariably the reason is high out-of-pocket spending. This high potential for financial catastrophe has much to do with how the health system is financed, and not only with the overall level of spending or the income of the country.

The fairness of the distribution of financial contribution is summarized in an index which is inversely related to the inequality in the distribution, and presented in Annex Table 7. The index runs from zero (extreme inequality) to 1 (perfect equality). For most countries, and particularly for most high income countries, the value is not far from 1, but great inequality characterizes a few countries in which nearly all health spending is out-of-pocket, notably China, Nepal and Viet Nam. However, in some countries where most spending is out-of-

Figure 2.5 Household contributions to financing health, as percentage of capacity to pay, in eight countries



pocket, there is nonetheless little inequality because that spending is relatively progressive and few families spend as much as half their non-food expenditure on health. Bangladesh and India are examples. Generally, high values of equality are associated with predominantly prepaid financing, but Brazil shows extreme inequality despite a high share of prepayment, because of the great inequality in incomes and the large number of families at risk of impoverishment.

The summary measure of fairness does not distinguish poor from rich households. Figure 2.5 introduces this distinction, by showing how the burden is distributed across deciles of capacity to pay, and divided between prepayment and out-of-pocket spending, in eight low and middle income countries. Prepayment is clearly progressive – the rich contribute a larger share – in Mexico and the United Republic of Tanzania, and also in Bangladesh and Colombia (not shown). It is actually regressive in India and Pakistan, and also in Guyana, Kyrgyzstan, Nepal, Peru and the Russian Federation (not shown). In other countries – Brazil, Bulgaria, Jamaica, Nicaragua, Paraguay, Romania and Zambia – the prepaid contribution is distributed more or less neutrally or varies irregularly. Out-of-pocket spending shows more variation, as might be expected; for example, it is progressive in India and quite regressive in Pakistan and Viet Nam, where there is almost no prepaid financing at all.

Total non-food spending also includes whatever the household spends out of pocket on health care. That spending is largely unpredictable or transitory, so to include it may overstate the family's capacity to pay. If out-of-pocket expenditure is small, it makes no difference; but if it is large, it may have been financed by selling assets, going into debt, requiring more family members to work or for some to take on more hours or other employments, or even temporarily reducing consumption of necessities. If household capacity to pay is defined as non-food spending *less* out-of-pocket health spending, then families with large out-of-pocket expenditures are classified as poor, instead of being scattered throughout the population. The way the health system is financed then looks systematically less fair in most countries, and the culprit is always the large share of out-of-pocket spending. Pre-

Box 2.3 What does fair contribution measure and not measure ?

The way fair contribution to health care finance is measured is strictly *ex post*, referring to what households actually contribute rather than to their *ex ante* risks of needing health care. That means that there is no need to estimate the "coverage" of the population by different risk-sharing schemes. Coverage in financial rather than nominal terms – how much people are really protected, not simply whether they have insurance or participate in social security – is hard to estimate beforehand, and in any case such coverage is, like accessibility, an instrumental rather than a final goal. Nominal coverage does provide people with a sense of security which also affects their spending and saving decisions, but that is not a goal in itself.

People who do not use care when they need it, because they cannot afford the out-of-pocket cost, appear to spend less than they really need to. Estimating what they *would* have spent if they could afford it would give a different distribution of contributions, and would almost surely show even more unfairness. Basing the measure on what is actually spent – which is all that the data allow – overstates the degree to which a health system achieves a fair distribution of the financing burden.

The measure also says nothing about how a family obtains the cash to pay out of pocket for health care (or for some forms of prepayment such as "health cards" or vouchers). Households much of whose income is in kind rather than cash may forego health care because they cannot obtain the cash when needed, and the data will show only that they did not spend. Without further analysis there is no way to distinguish illiquidity from all the other reasons why a health need did not eventuate in expenditure. A less serious but sometimes still consequential liquidity problem arises when a household has to pay out of pocket for care, and then wait for reimbursement from an insurer. This need to finance care temporarily arises for populations wealthy enough to have formal – usually private – insurance.

Finally, and most important, fair financing means only equity in how the financial burden of supporting a health system is shared. It says nothing about whether the *utilization* of health services is fair, which is an equally crucial issue in the overall fairness of the system. Fair financing is concerned with the principle of *from each according to ability*, but not with the principle of *to each according to need*. Unfairness in use relative to need shows up in inequalities in health status, because service utilization ought to reduce such inequalities so far as they are amenable to intervention.

payment in low income countries is commonly too small a share of the total to offset the regressive and very unequal impact of out-of-pocket spending. What is worse, in many countries there is *no* offsetting effect because prepayment via taxes is also regressive. In those cases the poor thus suffer twice – all of them have to pay an unfair share whether or not they use health services, and then some of them have also to pay an even more unfair contribution out of pocket. These are the strongest findings to emerge from the analysis of financing; their implications are developed further in Chapter 5. Box 2.3 discusses four other features of this way of measuring fairness in financing.

Much of the analytical effort behind this report went into developing more and better information about expenditure on health and constructing national health accounts. As described further in Chapter 6, knowledge of where resources are coming from, through what channels they flow and how they are used, is crucial to better stewardship of the system. Annex Table 8 presents the estimates of total health spending, its separation into private and public sources, the distinction between tax-financed and social security health spending in the public sector, and that between insurance and out-of-pocket spending in the private sector, and the overall distinction between prepayment and out-of-pocket spending that helps determine how fairly health systems are paid for. These data, besides being of direct interest, have been used to check the estimates of household expenditure discussed above and to estimate values for indicators that are strongly related to spending.

Whatever the sources and distribution of finance, the level of resources devoted to health is an input into the system, not an outcome: it is what makes the outcomes possible, and against which the system's achievements should be evaluated. The next two sections take up the question of how best to do this, first by developing an overall measure of attainment and then by relating that achievement to resource use, as a measure of performance.

Box 2.4 Weighting the achievements that go into overall attainment

To derive a set of weights for the different achievements that compose overall attainment, WHO conducted a survey of 1006 respondents from 125 countries, half from among its own staff. The questions were designed to elicit not only views about how important each goal is relative to the others (for example, responsiveness compared to health status), but also opinions about what kind of inequality matters most. The responses were checked for consistency and bias, and yielded nearly identical values in each of many different groups – poorer versus richer countries, men versus women, WHO staff versus other respondents. The final weights are shown in the table.

As expected, health is regarded as the most important of the objectives, clearly the primary or defining goal of a system. But fully half of the concern for health is a concern for equality, not simply for a high average. Taking "health" apart into two goals emphasizes the great value of fairness, and not only of goodness. This is fully consistent with WHO's concentration on the poor, the least healthy, the worst-off in society. Equal weights also result from the survey for the overall level and for distribution or equality where responsiveness is concerned. In total, how the system treats people in non-health aspects is as important as either health level or health equality. And fairness in how health is paid for, which is not a major traditional concern of WHO or the ministries of health it deals with and supports, receives the relatively large weight of one-fourth, equal to that for responsiveness. Both in this case and in that of responsiveness, the weight assigned by respondents probably reflects the direct or intrinsic importance of the objective, and also the indirect or instrumental contribution it makes to achieving good health; it is difficult to separate these two aspects. There is clear agreement that a well-functioning health system should do much more than simply promote the best possible level of overall health.

Health (disability-adjusted life expectancy)	
Total	50%
Overall or average	25%
Distribution or equality	25%
Responsiveness	
Total	25%
Overall or average	12.5%
Distribution or equality	12.5%
Fair financial contribution	
Distribution or equality	25%

The exercise of weighting the five objectives also provides values for the relative importance of goodness and fairness. Together, the *levels* of health and of responsiveness receive a weight of three-eighths of the total. The three distributional measures, which together describe the *equity* of the system, account for the remaining five-eighths. Countries which have achieved only rather short life expectancies and cannot adequately meet their peoples' expectations for prompt attention or amenities may nonetheless be regarded as having health systems which perform well with respect to fairness on one or more dimensions.

Overall attainment: goodness and fairness combined

To the extent that a health system achieves a long disability-adjusted life expectancy, or a high level of responsiveness (or a high degree of equality in either or both), or a fair distribution of the financing burden, it can be said to perform well with respect to that objective. Since a system can do well on one or more dimensions and poorly on others, comparison across countries or through time requires that the five goals be summed into a single overall measure. There is no natural scale on which to add together years of life, responsiveness scores, and measures of inequality or fairness, so combining the measures of achievement means assigning a weight or relative importance to each one. Box 2.4 describes the procedure and the results.

Applying these weights to the achievements described in Annex Tables 5, 6 and 7 yields an overall attainment score for each health system. These scores are presented in Annex Table 9, together with an estimate of the uncertainty around each value, derived from the uncertainties for the components. Because rich countries generally enjoy good health, and because high incomes allow for large health expenditures which are also predominantly prepaid and often largely public, the ranking by overall attainment is closely related to income and health spending. However, the large weight given to distributional goals explains why, for example, Japan outranks the United States and why Chile, Colombia and Cuba outrank all other Latin American countries. It is not surprising that, with three Asian exceptions, the 30 worst-off countries are all in Africa.

Performance: getting results from resources

The overall indicator of attainment, like the five specific achievements which compose it, is an absolute measure. It says how well a country has done in reaching the different goals, but it says nothing about how that outcome compares to what might have been achieved with the resources available in the country. It is *achievement relative to resources* that is the critical measure of a health system's performance.

Thus if Sweden enjoys better health than Uganda – life expectancy is almost exactly twice as long – that is in large part because it spends exactly 35 times as much per capita on its health system. But Pakistan spends almost precisely the same amount per person as Uganda, out of an income per person that is close to Uganda's, and yet it has a life expectancy almost 25 years higher. This is the crucial comparison: why are health outcomes in Pakistan so much better, for the same expenditure? And it is health expenditure that matters, not the country's total income, because one society may choose to spend less of a given income on health than another. Each health system should be judged according to the resources actually at its disposal, not according to other resources which in principle could have been devoted to health but were used for something else.

Health outcomes have often been assessed in relation to inputs such as the number of doctors or hospital beds per unit of population. This approach indicates what these inputs *actually* produce, but it tells little about the health system's *potential* – what it could do if it used the same level of financial resources to produce and deploy different numbers and combinations of professionals, buildings, equipment and consumables. In these comparisons, the right measure of resources is money, since that is used to buy all the real inputs.

To assess relative performance requires a scale, one end of which establishes an upper

limit or "frontier", corresponding to *the most that could be expected of a health system.* This frontier – derived using information from many countries but with a specific value for each country – represents the level of attainment which a health system might achieve, but which no country surpasses. At the other extreme, a lower boundary needs to be defined for *the least that could be demanded of the health system* (17). With this scale it is possible to see how much of this potential has been realized. In other words, comparing actual attainment with potential shows how far from its own frontier of maximal performance is each country's health system.

WHO has estimated two relations between outcomes and health system resources. One estimate relates resources only to average health status (disability-adjusted life expectancy, DALE), which makes it somewhat comparable to many previous analyses of performance in health. The other relates resources to the overall attainment measure based on all five objectives. The same value of total resources is used for a country in both cases, because there is no way to identify expenditure as being directed to producing health services, determining responsiveness or making the financing more or less fair. The same is true of resources used to improve the distribution of health or responsiveness, rather than the average level.

Each frontier is a function of one other variable besides health system expenditure. That is the average years of schooling in the adult population, which is a measure of human

Box 2.5 Estimating the best to be expected and the least to be demanded

WHO's estimates of the upper and lower bounds of health system performance differ in two important ways from most analyses of what health systems actually achieve. The first is that a "frontier" is meaningful only if no country can lie beyond it, although at least one must lie on it. The frontier or upper limit is therefore estimated by a statistical technique which allows for errors in one direction only, minimizing the distances between the frontier and the calculated performance values. (The lower bound is estimated by the conventional technique of allowing errors in either direction.) The second is that the object is not to *explain* what each country or health system has attained, so much as to form an estimate of what should be possible. The degree of explanation could be increased by introducing many more variables. If tropical countries show systematically lower achievement in health, because of the effects of many diseases concentrated near the equator, a variable indicating tropical location would raise the explanatory or predictive power. Similarly, if outcomes are worse with respect to equality in ethnically diverse countries, a variable reflecting that heterogeneity would explain the outcomes observed.

The difficulty with the attempt to explain as much as possible is that it leads to a different frontier, according to every additional variable. There would be one for tropical countries and another for colder climates; one for ethnically mixed countries and another for those with more uniform populations; and so on. If performance were measured relative to the frontier for each type of country, almost every health system might look about equally efficient in the use of resources, because less would be expected of some than of others. Every additional explanation would be the equivalent of a reason for not doing better. This is particularly true of explanations related to individual diseases: AIDS and malaria are major causes of health loss in many sub-Saharan African countries, but to include their effects in the estimation of the frontier means judging those countries only according to how well they control all *other* diseases, as though nothing could be done about AIDS and malaria. This is the reason for estimating the frontier according to nothing but expenditure and human capital, which is a general measure of society's capacity for many kinds of performance, including performance of the health system.

The measures of attainment draw on data referring to the past several years, to make the estimates more robust and less susceptible to anomalous values in any one year. The measures of expenditure and human capital are similarly constructed from more than one year's data. Nonetheless, both the outcomes and the factors that determine potential performance are meant to describe the current situation of countries. They do not take into account how past decisions and use of resources may have limited what a system can actually achieve today – which could also be a reason for poor performance – nor do they say how quickly a poorly performing system might be expected to improve and come closer to the frontier.

This way of estimating what is feasible bypasses two particularly complex issues which are well illustrated by control of tobacco-related mortality and disability. One is that many actions taken by health systems produce results only after a number of years, so that resources used today are not closely related to outcomes today. If a health system somehow persuaded all smokers to quit and no one to take up the habit, it would be many years before there was no more tobacco-induced disease burden.[1] The other is that no health system could reasonably be expected to bring smoking prevalence down to zero any time soon, no matter how hard it tried. Determining how to evaluate progress rather than only a health system's current performance is one of many challenges for future effort.

[1] Jha P, Chaloupka F, eds. *Tobacco control policies in developing countries.* Oxford, Oxford University Press for the World Bank and the World Health Organization, 2000.

capital and therefore of the long-run potential, if not the current or actual, state of development of the country. It is a proxy for most of the factors outside the health system that contribute to health status, and probably also to the degree of responsiveness and to how health is financed. Box 2.5 explains how the upper and lower limits are estimated and how they should be interpreted.

Since the estimation is based entirely on country data rather than a model of what is ideal or feasible, and since there are upper limits to all the achievements, the frontier rises rapidly with additional resources when spending is low, and then rises more and more slowly as expenditure reaches the levels typical of rich countries. A health system can move *towards* the frontier by improving performance, that is by achieving more with the same resources. It can move *along* the frontier by spending more or less on health and reaching a different level of attainment but the same degree of performance. The entire frontier can also move *outward*, as new knowledge makes it possible to achieve better health or other outcomes, for given health system resources and a given level of human capital. Most of the enormous improvement in health over the last century and a half, described in Chapter 1, is due to such an expansion or outward movement of what it is possible to achieve.

If there were no health system in the modern sense, people would still be born, live and die; life expectancy would be much less than now, but it would not be zero. There would be no expenditure on health and hence no question of how fairly the financial burden was distributed. Similarly, there would be no responsiveness. So the minimum level of achievement would involve only health status, and in the absence of information about inequalities, only the average level of health. In the measure of overall attainment the values for the other four objectives, including all those related to inequality, would be set at zero. To estimate this minimum, WHO has used information from a limited number of countries *circa* 1900, relating life expectancy – with no adjustment for disability – to estimates of income. The situation at the turn of the last century is taken as the starting point for the great advances made possible by increased knowledge, investment and resources devoted to health. Some of the changes have the effect of raising the minimum – the eradication of smallpox is the best example. The emergence of HIV/AIDS and of tobacco-related disease have the opposite effect, making it harder than it was in 1900 to achieve a given level of health.

The question for any health system today is, given the country's human capital and the resources devoted to its health system, how close has it come to the most that could be asked of it? Relating outcomes in this way to the estimated minimum and maximum attainments and to the use of economic resources defines the overall indicator of system *performance*: to perform well means to move away from the minimum attainment and come close to the maximum. In economic terms, performance is a measure of efficiency: an efficient health system achieves much, relative to the resources at its disposal. In contrast, an inefficient system is wasteful of resources, even if it achieves high levels of health, responsiveness and fairness. That is, it could be expected to do still better, because countries spending less do comparably well or countries spending a little more achieve much better outcomes.

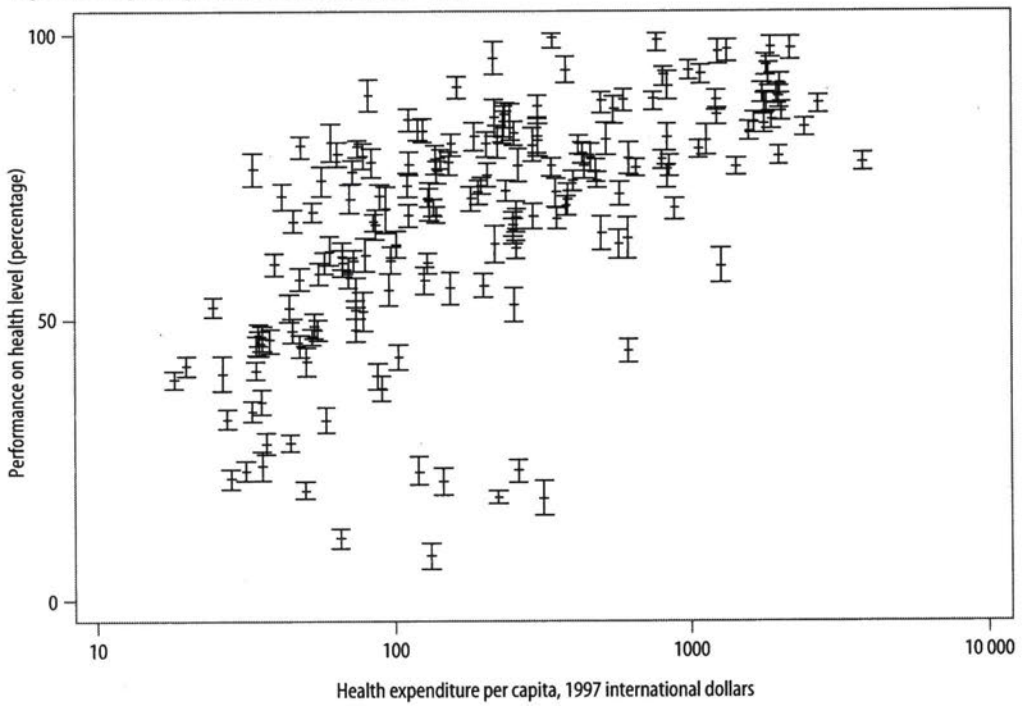
Annex Table 10 presents two indicators of health system performance. The first is based only on the average health status in disability-adjusted life expectancy (DALE) presented in Annex Table 5, comparing the frontier for that objective alone to a country's resource use and human capital. In this case, the upper and lower bounds between which performance lies are strictly comparable, and the measure can be compared to other estimates of what determines health outcomes. As with the measures of attainment, these values carry estimates of uncertainty. Figure 2.6 shows the estimated distribution of performance for all

countries with respect to DALE. Higher health expenditure is associated with better health outcomes, even when performance is judged relative to expenditure rather than absolutely. Very poor countries evidently suffer from other handicaps than low spending and low educational attainment. The few countries where spending is below $10 per person per year seldom appear to achieve more than 75% of the life expectancy that should be possible, whereas most countries spending more than $1000 achieve at least 75% of the possible. Higher spending is also associated with less variation in performance. Disturbingly large variations in life expectancy relative to spending and education occur at low and middle levels of expenditure where there is the greatest need to understand and reduce differences in achievement. A large part of the explanation is the HIV/AIDS epidemic: the 25 worst-off countries are all African nations suffering from a severe burden of AIDS. (Box 2.5 explains why the epidemic was not taken into account in defining the frontier of the possible.)

The second indicator in Annex Table 10 is based on the overall attainment measure presented in Annex Table 9 and assesses performance relative to the frontier defined for all five elements of achievement. The intervals around these values are much larger than for DALE alone because of the uncertainty surrounding the other components. These components also account for some considerable changes in the ranking, but the best performing systems still seem to be those of relatively rich countries and the worst off are predominantly poor and in Africa. Figure 2.7 presents the distribution of overall performance, which shows somewhat less variation than Figure 2.6: countries that perform poorly with respect to health alone sometimes compensate for this by doing better in responsiveness or financing or in dealing with health inequality. Nonetheless the rankings of the two performance measures are rather closely associated, with a small number of countries that do much better by one measure than by the other.

The belief that the system should be accountable for the level and distribution of attainment on the goals of health, responsiveness and fair financing, all relative to health

Figure 2.6 Performance on level of health (disability-adjusted life expectancy) relative to health expenditure per capita, 191 Member States, 1999



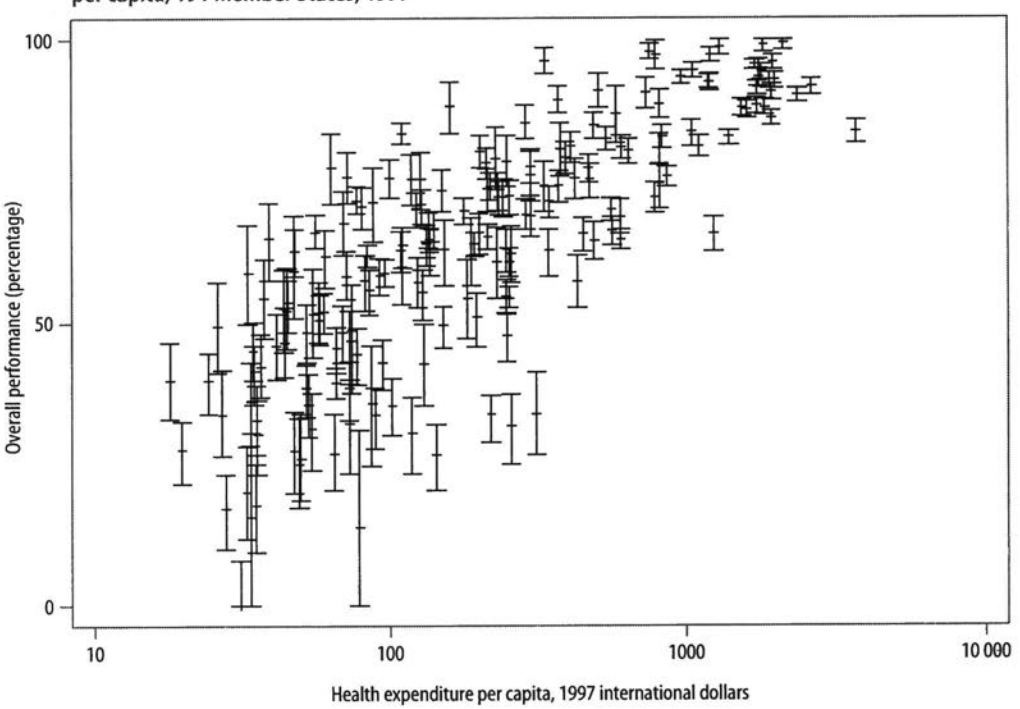
expenditure, will remain central in WHO's work to support health systems development over the coming years. From this issue, each year's *World health report* will contain more complete and better measures of countries' achievements, and WHO will support countries to strengthen local skills to analyse and improve health system attainment and performance.

IMPROVING PERFORMANCE: FOUR KEY FUNCTIONS

Policy to improve performance requires information on the principal factors which explain it. Knowledge of the determinants of health system *performance*, as distinct from understanding of what determines health *status*, remains very limited. This report focuses on a few universal functions which health systems perform, as indicated in Figure 2.1 above, asking what it means for those functions to be discharged well or poorly and suggesting how they are associated with differences in achievement among countries. This helps to look at the health system overall, rather than building up from the component sub-systems, organizations or programmes, as is more common in evaluations of performance *(18)*.

The service provision function is the most familiar, and in fact the entire health system is often identified with just service delivery. The classification here emphasizes that providing services is something the system *does;* it is not what the system *is*. Much of what is included in the financing function occurs outside what is usually considered to be the health system, as a process which happens to collect revenues and put them at the system's disposal. Treating fairness in financial contribution as one of the intrinsic goals of the system requires viewing the function partly as another of the tasks that the system *does*, rather than pas-

Figure 2.7 Overall health system performance (all attainments) relative to health expenditure per capita, 191 Member States, 1997



sively receiving money from somewhere else. It is the system which collects some of the funds directly, pools all that are pooled except for general taxation, and purchases goods and services. This means the system is at least partly accountable to society for how resources are raised and combined, and not only for how they are ultimately used.

Every health system makes some investments in creating resources, but these also are sometimes regarded as coming from outside the system itself. In the short run, the system can only use the resources created in the past, and often can do little to change even how they are employed. But in the long run, investment also is something the system does – and precisely because investments are long-lived, it has a responsibility to invest wisely. Relating achievements to total system expenditure may show that a system is performing badly precisely because what can be obtained from today's resources is needlessly limited by how resources were invested yesterday and the day before.

The fourth function is called *stewardship*, because the concept is well described by the dictionary definition: *the careful and responsible management of something entrusted to one's care (19)*. People entrust both their bodies and their money to the health system, which has a responsibility to protect the former and use the latter wisely and well. The government is particularly called on to play the role of a steward, because it spends revenues that people are required to pay through taxes and social insurance, and because it makes many of the rules that are followed in private and voluntary transactions. It also owns facilities on trust from the citizens. Private insurers and practitioners, however, perform this function in only a slightly restricted degree, and part of the state's task as the overall steward or trustee of the system is to see to it that private organizations and actors also act carefully and responsibly. A large part of stewardship consists of regulation, whether undertaken by the government or by private bodies which regulate their members, often under general rules determined by government. But the concept embraces more than just regulation, and when properly conducted has a pervasive influence on all the workings of the system.

These functions are identifiable in widely differing health system structures *(20, 1)*. At one extreme is a system in which functions are substantially combined in a single organization which raises, pools and allocates funds to a fairly monolithic group of service providers who are its own employees. The Norwegian health system resembles this type of structure, as did the British National Health Service prior to 1990. A system may instead have a high degree of "vertical" segmentation. Separate organizations such as the ministry of health, social security funds, the armed forces, charitable organizations, or private insurers may pay their own providers, raise and allocate funds and provide services, for non-overlapping populations. The health systems of much of Latin America bear some resemblance to this model, although patients often get care from two or more of the vertically separate organizations. A system could also have "horizontal" integration of each function – one organization performing it – but a different organization for each function. No system quite corresponds to this, because there is never a single bloc of providers, unless they are part of a fully integrated system. However, some systems such as that of Chile separate collection and pooling for a large share of resources, and employ a large number of providers under a single organization. At the opposite extreme from a monolithic organization is a system with separate institutions raising funds and paying providers under pluralistic provision arrangements in which few providers "belong" to the financing institution. The Colombian system, following the reforms introduced since 1993, looks somewhat like the latter.

Chapters 3, 4, 5 and 6 concentrate in turn on key characteristics of each of the four functions – service delivery, investment, financing and stewardship – and on some factors

affecting performance, examining patterns in countries at different income levels. The financing function obviously is most important for the goal of fairness in paying for the system, but how it is carried out also affects health outcomes and even has some effect on responsiveness. The service delivery function is most tied to health outcomes, but also matters greatly for responsiveness. And stewardship affects everything.

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