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The Cost-Effectiveness of Primary Care Services in Developing Countries: A Review of the International Literature

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List of acronyms

AIDS	Acquired immune deficiency syndrome
BCG	Vaccine to prevent tuberculosis
CMH	Commission for Macroeconomics and Health
DALY	Disability-adjusted Life Year
DOTS	Directly observed treatment, short course
DPT	Diphtheria, pertussis and tetanus vaccine
EBM	Evidence-based medicine
EPI	Expanded Programme on Immunisation
ESP	Essential service package
GDP	Gross Domestic Product
HAART	Highly active anti-retroviral therapy
Hib	Haemophilus influenzae type b
HIV	Human immunodeficiency virus
IEC	Information, education and communication
IMCI	Integrated Management of Childhood Illness
ITN	Insecticide-treated net
MDG	Millennium Development Goal
OI	Opportunistic infection
STI	Sexually transmitted infection
SWAp	Sector-wide approach
TEHIP	Tanzania Essential Health Interventions Project
TB	Tuberculosis
Tx	Treatment
UNICEF	United Nations Children's Fund
US	United States
VCT	Voluntary Counselling and Testing
WHO	World Health Organisation

THE COST-EFFECTIVENESS OF GENERAL PRIMARY CARE SERVICES IN DEVELOPING COUNTRIES:

A REVIEW OF THE INTERNATIONAL LITERATURE

1. BACKGROUND

This review was commissioned in 2003 by the Disease Control Priorities Project (and funded by the National Institutes for Health) as a background paper to support the development of a chapter on General Primary Care (Chapter 53) for the forthcoming second edition of *Disease Control Priorities in Developing Countries*. The review was intended to examine the literature that had emerged since the publication of an earlier review entitled *Cost Effectiveness of Primary Health Care* (Drummond and Mills 1987).

2. THE CONCEPT OF GENERAL PRIMARY CARE

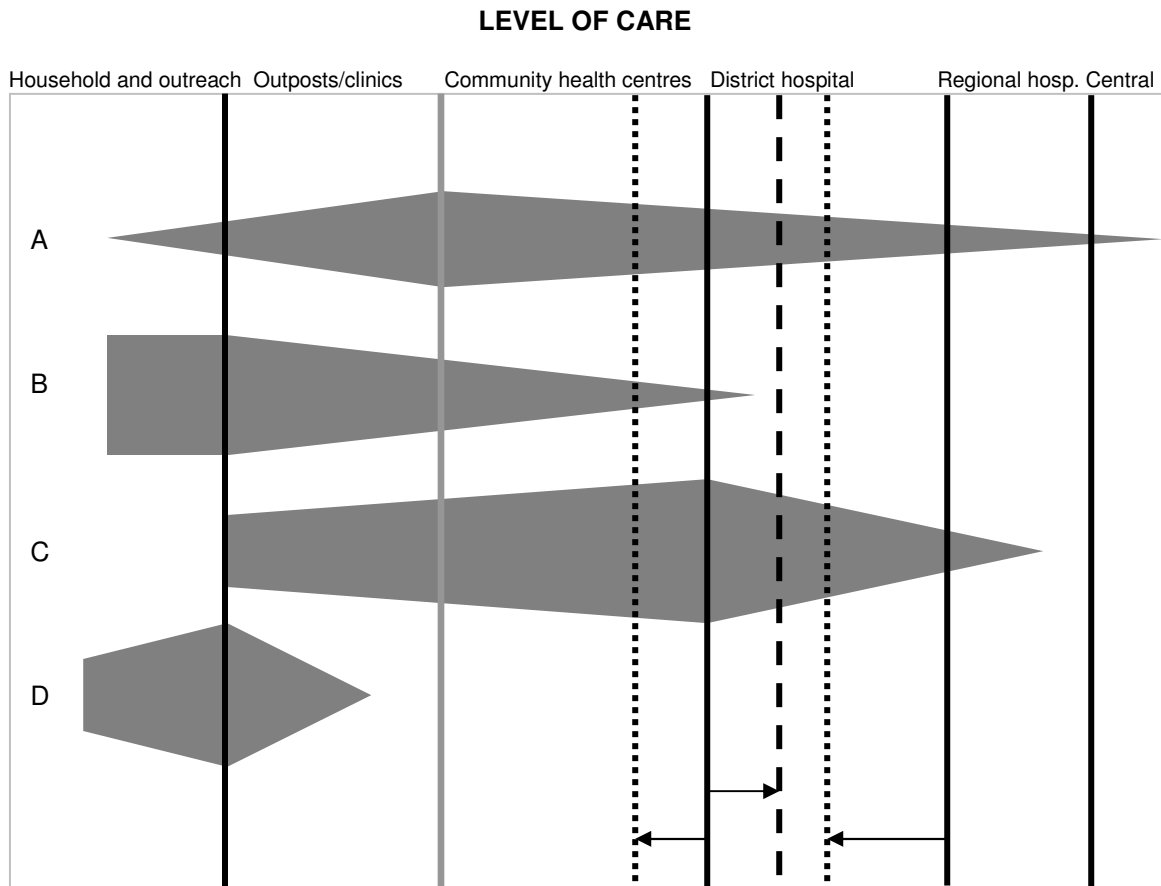
In this review, general primary care is taken to mean the comprehensive, integrated and continuing medical and health management of individuals and families when they first present to the formal health system. General primary care services are taken to include those delivered at 'primary level' facilities (such as health posts, clinics, community health centres and outpatient departments in district hospitals) and outreach services (such as mobile services and home visits).

The term 'General Primary Care' is distinguished from the 'Primary Health Care Approach' which is a much broader concept developed by the Alma Ata Declaration on Primary Health Care in 1978 (WHO/UNICEF 1978). The Primary Health Care Approach is a philosophy that, in some countries, forms the underpinning of the entire health system, and includes the concepts of equity, public health programmes, decentralisation, community participation, social development and inter-sectoral action. As a philosophy it affects the entire health system and 'implies a re-ordering of priorities that should permeate all levels and sectors concerned with the promotion of health' (WHO/UNICEF (1981), quoted in Tatar and Tatar (1997)). This review examines only that *aspect* of the Primary Health Care Approach that relates to individual- and family-based interventions, although other aspects are considered no less important to the development of healthy societies.

As part of the Primary Health Care Approach, general primary care should be linked closely with the needs of the community and integrated with other sectors involved in community development. It should also be integrated with other levels of care. In fact, one of the difficulties faced by this review is distinguishing those activities that occur at the primary level from those that occur elsewhere. In theory, the continuous care of an individual should form part of a seamless continuum that stretches, as needed, across all levels of care. For example, in **Diagramme 1** interventions for health condition A stretch across all levels of care, with most activities occurring at the primary level (this might be the case for pregnancy care, for example). By way of contrast, activities

associated with interventions for condition B are mainly located in the community, with some support being provided by smaller clinics (this might be the case for home-based care for chronic conditions, for example). Ideally, conditions should be managed at the type of facility that is most cost-effective. As this review will show, this is often the primary level. Ideally, then, services should be moved ‘upstream’ – towards the primary level – as much as possible (in **Diagramme 1**, see the shifting of the solid black lines towards the right).

Diagramme 1: The continuum of individual health care



Note: The grey shaded areas represent the extent of the activities associated with each intervention along the continuum of care.

As this review will show, many factors affect which package of interventions is both needed and cost-effective at a primary level; other factors affect the ability of the health system to deliver the package at this level adequately (the main factors are summarised in **Box 1**). These factors are discussed further in the pages that follow, but the implication for local health services is that the array of interventions that is appropriate to meet community needs varies from context to context, as does the ‘cut-off’ between various levels of care. In practice, limited resources and poor capacity at the primary level often mean that primary level services perform relatively limited functions (thus, in **Diagramme 1**, the solid black line between community health centres and district hospitals is shifted to the left).

Box 1: Examples of factors that affect the mix of interventions that is cost-effective at the primary level

Examples of factors affecting the cost-effectiveness of interventions determined internationally

International issues

- Changes in the global burden of ill-health due to the natural history of disease
- The impact of interventions on the burden of disease
- The methodology used by economic evaluations (e.g. perspective of studies, completeness of data, the incorporation of time considerations)

Local issues

- Local social, economic and cultural issues
- The extent to which the local burden of disease reflects priorities as identified by global estimates
- The extent to which services are integrated
- The efficiency of service delivery and the extent to which services have already been scaled up
- The role of the private sector and sources of finance for the package (interventions may not be cost-effective for patients although economic evaluations may determine them to be cost-effective for providers)

Examples of factors affecting the ability of the primary level to deliver cost-effective packages

International issues

- The development of new technologies

Local issues

- The historical structure and health practice traditions of the health system
- Physical infrastructure
- Geographic, financial and cultural accessibility
- Financial resources
- Human resources and capacity
- The ability to attract and retain staff
- Management and logistical support
- The functionality of the referral system

Given the dynamic nature of the relationship between cost-effectiveness, the burden of ill-health and health system performance, governments and local health service planners are sometimes hard-pressed to understand how international evidence on the cost-effectiveness of primary care interventions can be used to plan services on the ground. It is this critical issue that the review attempts to address in the context of an understanding that, whereas demands on the primary level are increasing, especially with the advent of the HIV/AIDS epidemic, the gains made by primary care services over the past decade have been mixed.

3. METHODOLOGY

Unlike the review published by Mills and Drummond (1987), this review does not attempt to review individual interventions at the primary level. This is because cost-effectiveness studies have burgeoned since the early 1990s: many of these studies will be reviewed (far more expertly than is possible by these authors) for several other chapters in the second edition of *Disease Control Priorities in Developing Countries*. Instead, this review concentrates of the evidence with respect to clusters or *packages* of basic primary care services.

The PubMed and International Bibliography of Social Sciences databases were searched using keywords such as 'primary care,' 'primary health care,' 'evaluation,' 'costs,' 'cost-effectiveness,' and 'effectiveness.' Articles identified by this search were extracted from the libraries at Wits University in South Africa and the London School of Hygiene and Tropical Medicine in the United Kingdom, or downloaded from the internet. Relevant references in articles that had been extracted were also followed up. Some key informants were contacted for suggestions of other literature that might be useful.

Time and resource constraints meant that the search could not be exhaustive, while several articles that were identified could not be accessed. An undoubted limitation of this review is also the shortage of grey literature, especially government reports on the make-up and experience of country-specific essential health packages. In addition, the preponderance of articles relate to the African experience. The approach in writing up the review has therefore been to ensure, first, that a set of *core* articles has been collected and, second, that articles represent a *range* of issues and debates.

All costs quoted in the review are in US dollars and have been converted to 2001 prices, using inflators calculated from figures supplied by Dr. Jo Mulligan of the London School of Hygiene and Tropical Medicine in the United Kingdom (see **Appendix 1**). The original prices quoted in reviewed articles appear in **Appendix 2**.

4. WHY ARE PRIMARY CARE SERVICES IMPORTANT?

Before reviewing the evolution of primary care package proposals, it is useful to reflect on why the primary level, as opposed to other levels, is pivotal to the creation of a well-functioning health system. Whereas it could be argued that highly cost-effective interventions deserve to be implemented, no matter the level for which they are designed, there are unique reasons why those available at the primary level should receive priority.

4.1 THE IMPACT OF PRIMARY CARE ON THE BURDEN OF ILL-HEALTH

4.1.1 The theoretical argument

Interventions at the primary care level are able to deal, at least theoretically, with 90 percent of health care demands (World Bank 1994:56). Only 10 percent of demands require the services and skills typically associated with hospitals. In addition, primary

care services have the advantage over hospital care that they are more accessible to the community. Because of their staffing and organisation, they are less costly, and more easily able to provide comprehensive, integrated, personalised and continuous care (see **Box 2**). This argument makes the case for providing services at the primary rather than hospital level wherever possible, although it does not look at the extent to which primary care is able to meet health care needs (as opposed to demands) and reduce significantly the burden of ill-health faced by communities. However, figures are not available for the total burden of ill-health that could be averted by interventions based at the primary level. To understand the actual health impact of primary care it is necessary to look at the empirical evidence.

Box 2: The comparative advantages of health centres

- Most health problems can be treated with the technology and competence available to well-functioning health centres.
- In 80 to 90 percent of preventive work and for most curative cases, the health centre can outperform hospitals in terms of continuity, comprehensiveness, integration and cost of care.
- The small scale of the health centre also favours integration of various programmes.
- Over-prescription is less common in health centres than in hospitals.
- The health centre is more accessible to the community and has the potential to communicate more ably with the community.
- Staff are able to know patients better, which reduces the loss to follow-up of patients.

Source: Adapted from World Bank (1994:58)

4.1.2 The empirical evidence

While common sense would predict that primary care has a substantial impact on health status, this impact is infamously difficult to measure. The key problem is to demonstrate the causal link between intervention and impact, and especially to distinguish between the contributions to improved health status of improvements in socio-economic conditions as opposed to health service delivery. Some authors argue that the impact of improvements in socio-economic status far outweigh any improvement in health care delivery (for example, Filmer, Hammer and Pritchett 1997, and Navarro 2000), although more recently the argument that well-functioning health services *can* improve health status, even in the context of poverty, has been made quite strongly (Jha and Mills 2002). Filmer, Hammer and Pritchett (1997) also point to some primary health care success stories – such as in Kerala (India) and Shanghai (China) – where some health status indicators are very much lower than might be expected given prevailing socioeconomic conditions.

Nonetheless, there is surprisingly limited evidence of the share of health improvement that can be attributed to primary care, even in industrialised countries (Filmer, Hammer and Pritchett 1997, Starfield 1998). In commenting during the mid-1990s on the evidence with respect to child mortality reduction in Sub-Saharan Africa, Magnani *et al.* (1996: 568) summarise Ewbank and Gribble (1993) as having said that ‘while the national health programmes of most countries include interventions that have been shown to reduce mortality in small test programmes, few strong statements could be made about the overall effectiveness of the large-scale, primary health care programme

efforts in the region.’ Writing at a similar time, Engelkes (1993:76) comments cynically that ‘due to a lack of reliable information from the field, donors’ decisions on PHC have in the past been taken mainly on political grounds.’

Reasons for the lack of evidence lie partly in the nature of the differences between field trials and routine programmes. These differences are summarized in **Box 3**. In addition, it is often difficult to set up an appropriate design to assess the impact of routine programmes. For example, control areas are difficult to delineate for a number of reasons, including pressures to provide comprehensive coverage. Also, the detailed records required for assessment might be prohibitively expensive and, in themselves, change the nature of the programme (Ewbank 1993). Engelkes (1993) points also to the severe limitations in primary care projects’ capacity to evaluate themselves, as well as to the deficiencies in donors’ approaches to evaluation (see **Box 4**).³

Box 3: The differences between field trials and routine programmes

- Most studies focus on single interventions, whereas actual services tend to combine interventions;
- Impacts measured in field trials are not necessarily the same as those measured by routine programmes;
- There is considerable inconsistency between different studies;
- Many studies are located in small geographic areas in a limited number of settings where generalisability is uncertain, especially if long-term research is being undertaken in the area;
- The indicators examined in the field trial may not identify and measure the relevant causal variable;
- The impact of a routine programme may be different because of a different coverage rate, especially when the programme combines several individually tested interventions (if an intervention is not delivered to an adequate proportion of the population it will not have the expected impact); and
- The impact of a routine programme may be different because of differences in the quality of care provided under field trial versus normal conditions.

Sources: Ewbank (1993), Magnani *et al.* (1996)

³ Donor-driven evaluations also tend to be performed during the times of year that are least hostile, thus tending to under-estimate problems (personal communication, Dr. Don de Savigny, Swiss Tropical Institute).

Box 4: Review of weaknesses in donor-driven evaluations of primary health care projects

- Many donors did not have guidelines. If guidelines existed, they were often more concerned with format than methodology.
- Terms of reference for external evaluators were often vague and tended to be donor-oriented. External consultants were left to collect information in the way they wanted.
- Evaluations by external evaluators usually had to be performed within two to three weeks which is very short when a country is unknown to a consultant and a project has been running for several years.
- Few projects had internal evaluation and monitoring systems and data, if they were collected, were not collected systematically. External consultants were therefore seldom confronted with objective information.
- National counterparts to foreign consultants were usually passed over or unable to participate as equals (due to lack of time and information) in evaluations.

Source: Adapted from Engelkes (1993)

Filmer, Hammer and Pritchett (2000) raise two additional sets of issues that help to explain why the effects on health improvement of primary care programmes in developing countries seem, in their view, have been disappointingly small. First, Health Ministries face enormous difficulties in ensuring that money targeted for primary care is translated into quality health services on the ground. Bryce *et al.* (2003), in commenting on the experience of implementing the Integrated Management of Childhood Illnesses strategy, provides some concrete examples of such difficulties, including insufficient training and supervision, high staff turnover, and fragmentation of activities. In fact, Almeida *et al.* (2001) contend that historical analyses of the effectiveness of primary care have tended to ascribe failures to internal weaknesses in the concept, whereas the external context in which the concept was initiated was fundamentally hostile. They write that ‘there is no recognition of the cataclysmic effect on public health systems in less-developed countries of the global economic recession of the 1980s and the application of policies stressing privatisation and decreased public spending in that decade and the next, which resulted in rising poverty and under-funding of health services in many less-developed countries, to the point of near-collapse in the poorest countries’ (Almeida *et al.* 2001).

Filmer, Hammer and Pritchett (2000) also contend that the provision of public primary care services may sometimes have ‘crowded out’ the consumption of equally effective services rendered by the private sector, which might explain the observed, limited impact of the curative component of primary care services. This last point highlights the importance of measuring the net impact of packages. Magnani *et al.* (1996) provide another example of where this is important, noting that ‘gains realised through single interventions might be offset by continued high levels of exposure to other risk factors for mortality in low-income country settings; that is, through “replacement mortality”.’

These problems notwithstanding, some studies have been able to demonstrate success in the area of child health. Bryce *et al.* (2003) point to a number of successful small-scale projects. On a larger scale, Magnani *et al.* (1996) show, using data from a national survey in Niger, that children living in villages near to health dispensaries were 32 percent less likely to die than children without access to modern primary care services (differential access was due to the phased implementation of services which represented

a natural quasi-experiment). The use of multi-variate and other analyses suggest that these results were not due to the location of dispensaries in villages that were predisposed to lower mortality. Magnani *et al.* (1996:574) conclude that 'packages of basic primary health care services can be effectively mounted at the national level so as to have a significant impact on infant-child mortality over a fairly short period of time.,' but acknowledge that the impact of services may have been exaggerated by the high initial level of mortality, as well as the occurrence of famine and a severe measles outbreak during the study period. However, these sorts of conditions are not uncommon in many developing countries.

In a separate study, Ewbank (1993:S64,S71) states that the results of surveys in Zaire and Liberia 'suggest that child survival programmes in Africa can reduce mortality substantially in populations living in different environments at very different initial levels of child mortality ... In both countries, it appears that the programme reduced mortality under age 5 by about 20% or more.' The author assesses these findings as robust because of their constancy under differing circumstances, as well as their consistency with other studies. In addition, this study improved on earlier surveys because it examined a longer follow-up period, assessed routine rather than special programmes, and was not limited simply to immunization activities (including, as it does, oral rehydration services and treatment with anti-malarial drugs). Ewbank (1993:S71) notes, however, that 'it is not clear to what extent each of the programme components contribute to the reduction of mortality. While the cumulative evidence on measles vaccination is quite impressive, there is much less evidence on the contribution of BCG, DPT, home-based use of oral rehydration, and presumptive treatment of fevers with chloroquine. Therefore, while the overall programme is apparently successful, the optimal combination of interventions to reduce mortality has yet to be determined.'

Given the paucity of developing country evidence, it is useful to turn to the experience of the United States. Shi (1994) finds that, in the United States, primary care is 'by far the most significant variable related to better health status, correlating to lower overall mortality, lower death rates due to diseases of the heart and cancer, longer life expectancy, lower neonatal death rate, and low birth weight.' In studies undertaken by Shi and Starfield (2000, 2001) on income inequality and primary care, it was established that there exists a significant association between higher primary physician supply and good health status, even in the context of higher income inequality: 'The findings of a significant association between primary care and self-rated health contributes to the mounting evidence that specific aspects of health care services have an independent effect on improving population health, in particular, the beneficial effects of primary care' (Shi and Starfield 2000). The authors suggest, therefore, that, within the particular setting studied, strengthening of the primary care aspects of health services could mitigate some of the adverse impacts that income inequality has on individuals' health status.

In reviewing a number of studies that look at the 'efficacy' of primary care services for vulnerable populations in the United States, Blumenthal, Mort and Edwards (1995) find considerable evidence of positive impacts, especially on utilisation (see **Box 5**). They make the point that the literature does not adequately address the issue of whether primary care reduces the cost of care for under-served populations but conclude that 'a commitment to primary care should be made for its potential to improve the satisfaction and health status of the American public, not for its potential to save money' (Blumenthal, Mort and Edwards 1995:269).

Box 5: Evidence of the efficacy of primary care services

1. Community-based interventions improve access to services, reduce the use of emergency and outpatient departments at hospitals, increase the use of non-institutional ambulatory care, and reduce the use of hospital care (especially with respect to preventable hospitalisations).
2. Primary care is associated with improved control of routine illnesses that have serious consequences if untreated.
3. The availability of primary care services improves patients' self-perceived health status.
4. The longitudinal care afforded by primary care services is independently associated with improved patient satisfaction, reduced use of ancillary and laboratory tests, improved patient compliance, shorter length of stay, and improved recognition of patients' behavioural problems.

Source: Adapted from Blumenthal, Mort and Edwards (1995)

4.2 THE COST-EFFECTIVENESS OF PRIMARY CARE INTERVENTIONS

In 1993, the World Bank published the first detailed figures on the global cost-effectiveness of different interventions in its World Development Report, *Investing in Health* (World Bank 1993).⁴ The report found that, in countries with moderate to high mortality, only a few causes accounted for the majority of the burden of ill-health. In 1990, fifty-five percent of the global burden of disease was concentrated in children under 15, and 75 percent of this burden was caused by 10 disease conditions or clusters (Bobadilla *et al.* 1994). Except for congenital malformations, all these causes correspond to very cost-effective interventions, most costing less than \$100 per disability-adjusted life year (DALY)⁵ averted. Together, it was estimated, these interventions could eliminate 21 to 28 percent of the burden of ill-health in children.

The burden of adult disease was found to be less concentrated: here, the ten main causes of disease and injury accounted for only 50 percent of the burden.⁶ Most interventions are quite cost-effective but the impact is moderate because they only prevent or treat a small fraction of the problems. Such interventions would only eliminate 10 to 18 percent of adult disease burden.

Amongst the highly cost-effective interventions against both the childhood and adult burden of ill-health that were identified by *Investing in Health* as part of a 'minimum package of health services,' were some of the classic components of primary care (see the 'clinical services' listed in **Table 1**). Indeed, all of the 'public health' activities, except possibly the school health programme, include some element of individual service delivery in the primary care setting.

⁴ Strictly speaking, the report depended on cost-utility analysis but the term cost-effectiveness analysis has become indelibly associated with the report.

⁵ A DALY is the sum of the burden of disease due to premature death and that due to non-fatal disability.

⁶ Bobadilla *et al.* (1994) comment that separating interventions for age group is artificial as benefits accrue in later life (e.g. hepatitis vaccine) and improve well-being (e.g. cognitive abilities). Adult interventions also have benefits for children (HIV prevention, prenatal care).

Table 1: Cost-effectiveness of the health interventions (and clusters of interventions) included in the minimum package of health services as recommended by the World Bank Development Report (1993) for low- and middle-income countries (2001 prices)

INTERVENTIONS	COST PER DALY (\$)	
	Low-income countries	Middle-income countries
Public health		
Expanded programme of immunization plus (i.e. including vaccine against Hepatitis B and Vitamin A supplementation)	15-22	32-38
School health programme	25-32	48-54
Tobacco and alcohol control programme	44-70	57-70
AIDS prevention programme	4-6	16-23
Other public health interventions (includes information, communication and education on selected risk factors and health behaviours, plus vector control and disease surveillance)	*	*
<i>Total</i>	18	
Clinical services		
Chemotherapy against tuberculosis	4-6	6-9
Integrated management of the sick child	38-63	63-127
Family planning	25-38	127-190
STD treatment	1-4	13-19
Prenatal and delivery care	38-63	76-139
Limited care (includes treatment of infection and minor trauma; for more complicated condition, includes diagnosis, advice and pain relief, and treatment as resources permit)	253-380	507-760
<i>Total</i>	*	168

Notes:

* information is not available for the cells that have been left blank, presumably because the authors were not able to aggregate data up to this level

** this understates cost-effectiveness because the analysis looked at the probability of transmission to others only in the first year

Source: Bobadilla *et al.* (1994:657)

4.3 THE AFFORDABILITY OF PRIMARY CARE SERVICES

Drummond and Mills (1987) found the best estimate of the cost of effective PHC (including the recurrent and capital costs of basic and village-level health services but not of water and sanitation) to be 2 percent of annual per capita GNP. This was based on the annual per capita costs of demonstration projects that ranged from \$2.85 to \$27.26 in 2001 prices (see **Table 2**).⁷ These are considerable amounts, given that many developing country governments do not spend as much as 2 percent of annual per capita GNP on their entire health sector.

⁷ Drummond and Mills (1987) argue that, while the costs of large-scale PHC programmes may be lower than these estimates, they may well not be providing effective services.

Table 2: The costs of six primary health care projects reviewed by Gwatkin *et al.* (1989) (2001 prices)

LOCATION	PRICE BASE (yr)	ANNUAL PER CAPITA COST (2001 prices)	% OF ANNUAL PER CAPITA GNP
Imesi, Nigeria	1966	6.79	2.0
Etimesgut, Turkey	1968-74	27.26-22.48	1.5-2.0
Narnangwal, India	1970-73	3.04-6.54	0.8-2.0
Rural Guatemala II	1969-77	*13.96/8.53	0.75-1.0
Jamkhed, India	1978	2.85-3.41	1.00-1.25
Kavar, Iran	1975	9.59-14.67	0.4-0.5

* Only one price was quoted in the original article: as it was not clear to which year this price applied, a conversion has been supplied for both 1969 and 1977

Source: Drummond and Mills (1987:77)

The *Investing in Health* estimates for the minimum package outlined in **Table 3** was \$15 per capita per annum in low-income countries and \$28 in middle-income countries (2001 prices). The difference in costs between low- and middle-income countries are due to different demographic structures, epidemiological profiles, burdens of disease and labour and other input costs. Two thirds of the cost - \$9.9 and \$18.6 in low- and middle-income countries respectively - was devoted to clinical services. These estimates were calculated through two methods, one by summing the costs of individual interventions, the other by costing a 'prototype' district health system capable of delivering the package (Bobadilla *et al.* 1994). The prototype consisted of a district hospital, health clinics and outreach activities, and required one district hospital bed per 1000 population, 0.1 physicians per 1000 population, and 2 to 4 nurses per physician. Costs were based on effective interventions, rather than the costs of actual, often ineffective services on the ground.

On the whole, the World Bank figures are higher than earlier estimates. In addition, achieving universal coverage would probably raise marginal costs substantially above average, because of the added costs of extending service delivery to people living in remote areas. It is typically these poor that need public subsidies the most. Bobadilla *et al.* (1994:661) note that, in these instances, 'the relative importance of cost-effectiveness versus equity will then determine whether to modify the package by leaving out some interventions, providing mobile services rather than fixed facilities, concentrating on public health rather than clinical interventions for the high-cost population, or sacrificing some efficiency in order to preserve equity.' Another justification for accepting a high marginal cost would be the potential to eradicate a disease completely, as thereafter there would be no further costs (as is the case for smallpox).

Table 3: The per capita costs of delivering the World Bank minimum package (2001 prices)

INTERVENTIONS	ANNUAL COST PER CAPITA (\$)	
	Low-income countries	Middle-income countries
Public health		
Expanded programme of immunization plus (i.e. including vaccine against Hepatitis B and Vitamin A supplementation)	0.6	1.0
School health programme	0.4	0.8
Tobacco and alcohol control programme	0.4	0.4
AIDS prevention programme	2.2	2.5
Other public health interventions (includes information, communication and education on selected risk factors and health behaviours, plus vector control and disease surveillance)	1.8	3.9
<i>Total</i>	<i>5.3</i>	<i>8.7</i>
Clinical services		
Chemotherapy against tuberculosis	0.8	0.3
Integrated management of the sick child	2.0	1.4
Family planning	1.1	2.8
STD treatment	0.3	0.4
Prenatal and delivery care	4.8	11.1
Limited care (includes treatment of infection and minor trauma; for more complicated condition, includes diagnosis, advice and pain relief, and treatment as resources permit)	0.9	2.7
<i>Total</i>	<i>9.9</i>	<i>18.6</i>
Grand Total	15.0	27.2

Source: Bobadilla *et al.* (1994:657)

Thus, although the minimum package is able to control large disease burdens and at little cost compared to a host of other interventions, the fact remains that many poor countries are unable to finance the minimum package themselves. On average, governments tend only to spend \$7.6 per capita in 2001 prices, a figure which rises to \$17.7 only when private sources are included (Bobadilla *et al.* 1994). This implies the need for increased public spending on health, reorientation away from discretionary services (that is, services not in the minimum package), targeted public spending on the poor, and the harnessing of private and donor resources. The fact that primary care – even of the most elementary kind - is presently unaffordable to most poor countries is of great concern, and lies behind the call by the Commission for Macroeconomics and Health (Jha and Mills 2002) for massive donor commitments to tackle health problems in these countries. It is probably also partly responsible for the continued implementation of vertical programmes, despite continued punting of the ‘minimum package’ concept, as shown in a later section.

4.4 THE NON-HEALTH IMPACTS OF PRIMARY CARE

While most of the recent literature on primary care packages places value on primary services because of their ability to reduce the burden of disease considerably and at low cost, there are potentially other benefits that such services bring to society. Some of these – such as accessibility, continuity and improved communication - have already been referred to in **Box 2**. However, amongst the most striking benefits may be the welfare benefits that accrue to households as a result of the prevention of severe disease. Severe disease can limit the ability of patients and caregivers to work, and also lead to the consumption of household assets in the purchasing of care. Russell (2003) finds that such costs amounted to just over 10 percent of household income in three developing country settings studied, proportions which can have a catastrophic impact on the sustainability of poor households. Through prevention and early treatment, accessible primary care services can reduce the negative economic consequences of ill-health for households, reduce absenteeism and enhance children's performance at school.

Primary level services are also potentially more responsive to patients' non-health needs. These include the need for health services to meet community expectations and to treat patients in a pleasant manner. In addition, primary level services have the ability to act as community resources (providing meeting places, for example) and to engage in community development activities.

All in all, well-functioning primary level services represent the 'face' of the health system, and have the potential to inspire trust in the system as a whole. In reality, primary level services undoubtedly often fall far short of this potential. However, this does not explain the scant attention paid to these features in analyses of the 'value for money' provided by this level of care.

5. THE EVOLUTION OF THE MINIMUM PACKAGE CONCEPT

5.1 COMPREHENSIVE VS SELECTIVE PRIMARY HEALTH CARE

The 1978 Declaration of Alma-Ata focused international health care efforts on low-cost, low-complexity interventions of both the medical and social sort, and at both the primary and community levels. In particular, the Declaration emphasized the importance of primary health care as a strategy for transforming the health system and contributing to community development through, for example, community involvement in decision-making and the supply of water and sanitation. The health care interventions were described only in broad terms and were not costed. Indeed, the recommendations were based on very incomplete data on the burden of disease, especially with respect to non-communicable diseases and the causes of disability, and health gains at this time were largely measured in terms of the reduction of mortality (World Bank 1994). Cost-effectiveness data were also very limited. Nonetheless, the suggested health care interventions were very similar to what were later proposed by the World Bank. Overall, though, the Alma-Ata conceptualisation of primary health care is perceived to have been much more comprehensive and patient-centred.

Soon after the Alma Ata Declaration, the apparent unaffordability of the Primary Health Care Approach led to the emergence of the concept of 'selective primary health care' as expressed, for example, by Walsh and Warren (1979). This advocated focusing initially on a limited number of components, often directed towards children's health and individual tropical diseases. Selective interventions were often centrally planned, and managed and operated by dedicated staff. They were intended as entry points into the health care system, and proved especially useful for eradication campaigns and dealing with epidemics following natural disasters (World Bank 1994).

However, the selective approach was criticized for not acknowledging that primary care must take account of the range of diseases that present, some of which were not included in the selective agenda (World Bank 1994). In addition, administrators implementing what were essentially vertical programmes often have little contact with local officers, and seldom co-ordinate well with other vertical programmes. Briggs, Capdegelle and Garner (2003) note that fragmentation may lead to duplication of training, supervision and logistics management. Other inefficiencies are caused by the need for specialised staff which in turn leads to greater numbers of staff, and the wasting of service users' time if they have need of multiple services. 'Verticalisation' can also lead to competition between programmes, the favouring of some issues at the expense of others, poor continuity of care, the disruption of routine health care and the disruption of national capacity.

In commenting in 1993 on progress since the Alma-Ata Declaration, Engelkes (1993:72) writes that 'more than 10 years have elapsed since then, and initial optimism has been replaced by scepticism, criticism and, in many instances, a change of direction from horizontal, integrated, comprehensive PHC projects towards vertical, selective activities like immunisation campaigns.' Writing at a similar time, the World Bank (1994:50) notes that 'in the years subsequent to the Alma-Ata Declaration, efforts to provide primary health care have taken the form of either highly selective, 'vertical' programmes designed to deal separately with specific health problems, or broader programmes involving community or village health workers. In most African countries, neither of these strategies has done much to persuade policymakers to shift resources away from curative care to a well-defined package of cost-effective primary and preventive care services.'

This sense of disillusionment with vertical programmes – together with the continued misallocation of resources towards expensive, cost-ineffective care - led to the development of the concept of 'packaging' of services in the early 1990s, culminating in *Investing in Health*. This tendency notwithstanding, vertical services still continue in many instances, reflecting the constraints faced by developing countries in mounting a full set of services. Vertical programmes are also attractive to donors, as it is easier to set targets and monitor results for such programmes (Unger, de Paepe and Green 2003).

It has to be acknowledged that, in some instances, centrally planned and vertically delivered services may perform better than services which are locally planned and delivered and integrated with existing services (Unger, de Paepe and Green 2003). Briggs, Capdegelle and Garner (2003) note that there is as yet no concrete evidence to

suggest that decentralised or ‘horizontal’⁸ services are superior to vertical services in terms of impact. This conclusion was based on the four sole studies that have set out to compare the relative benefits of horizontal versus vertical services, and the authors identify methodological flaws in each of these, so there is clearly a need for further evaluations. However, there is some evidence that horizontal services are less costly, as one would have expected from the inefficiencies associated with verticalisation. This has important implications for the sustainability of health services. Unger, de Paepe and Green (2003) make a strong theoretical argument for the desirability of decentralised services in terms of the practical management of patients.

A recent addition to the horizontal-vertical debate has been the move towards clustering of services into ‘integrated programmes’ that attempt to do away with the excessive separation implied by vertical services, whilst retaining some sort of focus, the Integrated Management of Childhood Illness (IMCI) being one such example. Integration bundles services across several diseases using a common delivery technology and point of contact with the beneficiary. In doing so, it addresses more of the burden of disease at less cost than would individual interventions separately, improving efficiency. It also facilitates the training of health workers in dedicated skills. An integrated intervention can be delivered in either a vertical manner (as once was done for EPI) or in a decentralized manner, as frequently done now.

5.2 **‘INVESTING IN HEALTH’**

Investing in Health was premised on the assumption that no country can afford to provide all the health care services that are needed by its population, and that it is therefore important to establish criteria for which services will be funded. The two most important criteria, as identified by the report, are the size (or potential size) of the burden caused by a disease, injury or risk factor, and the cost-effectiveness of interventions to deal with it. Only if an intervention is cost-effective, while *simultaneously* eliminating a large proportion of the burden of disease, should it become a priority.

The importance of the first criterion led to the establishment of the Global Burden of Disease enterprise of the World Bank and WHO. This enterprise has three central aims (Murray and Lopez 2000:70):

- (i) ‘to decouple epidemiological assessment of the magnitude of health problems from advocacy by interest groups of particular health policies or interventions;
- (ii) to include in international health policy debates information on non-fatal health outcomes along with information on mortality; and
- (iii) to undertake the quantification of health problems in units that can be used in economic appraisal’

A second undertaking was the review of cost-effectiveness data to identify a minimum package of interventions able to address the main health problems. While the concept

⁸ Briggs, Capdegelle and Garner (2003), and Unger, de Paepe and Green (2003) use the term ‘integrated’ rather than ‘horizontal/decentralised’ However, in this document, the term ‘integrated’ is used in a different sense.

of cost-effectiveness was a strong thrust of the report, so was the concept that interventions should be packaged together. This represented a shift away from the tendency to verticalise health programmes (although it did not go as far as to endorse the philosophy of comprehensiveness put forward by the Alma-Ata Declaration). The justification of the need for packaging of services was as follows (Bobadilla *et al.* 1994):

1. When governments simply fund or provide a list of services without considering their relationship, they do not take account of either the joint costs of programmes or the co-morbidities experienced by patients.
2. When governments simply pay for a collection of inputs and leave decisions on services to health care workers, or to patients who demand services, then services of questionable value tend to be rendered.
3. Thus, 'the principal argument for a collection of services to be provided jointly is to minimize the total cost of the package by exploiting the shared use of inputs and by reducing the cost to patients of obtaining services. Clustering of interventions improves cost-effectiveness through at least three mechanisms: synergism between treatment or prevention activities; joint production costs; and improved use of specialized resources through the screening of patients at the first level of care, to ensure that a small share of high-risk cases can be recognized and referred to hospital. Sometimes a cluster of diseases can be treated together, because they share diagnostic procedures or treatment protocols, or even the same drugs. And sometimes services can be organised to reach related individuals e.g. integration of maternal and child care. Thus the package becomes more than simply a list of interventions: properly understood, it is also a vehicle for orienting demand and improving referral' (Bobadilla *et al.* 1994:654).
4. Another, non-medical reason for packaging is that governments tend to find it difficult to set priorities and plan investments, and a minimum package – as well as an essential package (which, in the terminology of *Investing in Health* means any additional priority services that can be afforded above the minimum), creates a useful basis for planning.

The cost-effectiveness estimates used by *Investing in Health* were derived from Jamison *et al.* (1993), with some modification. As indicated earlier, costs were calculated per disability-adjusted life-year (or DALY). In turn, DALYs were calculated as the sum of losses to premature mortality and disability. Because of methodological difficulties experienced at this time in estimating the burden of disease due to different risk factors, only a few interventions against risk factors could be evaluated. Cost-effective interventions against those factors that resulted in a large burden of disease – or had the potential to cause a large burden of disease (such as the growing HIV/AIDS epidemic and increasing tobacco consumption) – were included in the package. A notable exception was water and sanitation which is cost-ineffective according to economic evaluations which do not consider non-health benefits.

The cost-effectiveness of interventions was seen to vary greatly and 'by much more than the likely errors of estimation or the variation in cost-effectiveness from one country or epidemiological situation to another' (Bobadilla *et al.* 1994:654). This, together with the fact that some of the most cost-effective interventions were ones that dealt with large

burdens of disease,⁹ made it relatively easy to distinguish which services should be included in a minimum package and which should not. Bobadilla *et al.* (1994:654) were therefore able to conclude that 'it matters which services are included in a package; this would not be the case if the cost per healthy life-year gained were about the same for all services.'

5.3 **'BETTER HEALTH IN AFRICA'**

Investing in Health was followed in 1994 by another World Bank publication, *Better Health in Africa* (World Bank 1994). This publication drew on the thinking of the 1993 report but applied it more specifically to the African continent. In particular, it attempted to give guidance on how to operationalise 'a cost-effective approach to health' (World Bank 1994:4). It identified three 'underpinnings' for such an approach, the first of which is the use of cost-effective packages of services targeted at the main health problems. The second underpinning is the decentralization of service delivery to the district level, including the expansion of health centres and district hospitals.

The report was based on the assumption that 'systems composed of well-functioning health centres and first-referral hospitals are capable of responding to, and accommodating, more than 90 percent of health demands in an average rural/peri-urban district' (World Bank 1994:129). The report made explicit the types of services that should be available at each level of facility (see **Table 3** in **Appendix 2**), perhaps correcting the impression given by a superficial reading of *Investing in Health* that the basic package is delivered only at the primary level. The third underpinning is the improved management of personnel, pharmaceuticals and infrastructure.

The *Better Health in Africa* package included more or less all the services proposed by *Investing in Health* (with both public health and clinical services being termed 'individual health services'), although it is generally difficult to compare package proposals as the level of detail provided on each intervention tends to vary considerably (see **Table 4**). A notable exclusion in *Better Health in Africa* is malaria prevention. A notable inclusion, however, is water and sanitation, something that had not been part of the health package priorities put forward by *Investing in Health*, for the reasons mentioned earlier. It is only in 2002 that water-related interventions (but not sanitation) make their way back onto cost-effectiveness lists.

⁹ Cost-effective interventions were not included for conditions that are very rare, or which result in negligible individual health loss. If a rare condition causes large losses to individuals it was seen as a candidate for inclusion in the expanded version of the package (i.e. the essential package).

Table 4: A comparison of the different basic packages proposed by WHO/UNICEF, the World Bank, WHO and the Commission on Macroeconomics and Health

INTERVENTION	<i>Alma Ata Declaration (1978)</i>	<i>Investing in Health (1993)</i>	<i>Better Health in Africa (1994)</i>	<i>WHO report 2000</i>	<i>CMH Working Group 5 (2002)</i>	<i>WHO report 2002</i>
Maternity-related interventions	+	+	+	+	+	
Antenatal care		+	+	+	+	
Treatment of complications during pregnancy		+	+	+	+	
Skilled birth attendance		+	+	+	+	
Emergency obstetric care		+	+	+	+	
Postpartum care		+	+	+	+	
Family planning		+	+	+	+	
Nutrition: pregnant and lactating women			+			
Tetanus toxoid				+		
Childhood disease-related interventions (prevention):	+	+	+	+	+	+
BCG	+	+	+	+	+	
Polio vaccine	+	+	+	+	+	
DPT	+	+	+	+	+	
Measles	+	+	+	+	+	
Hepatitis B		+	+	+	+	
Hib		+	+		+	
Vitamin A supplementation		+	+	+	+	+
Iodine supplementation			+	+	+	+
Zinc supplementation						+
Anthelmintic treatment				+		
School health programme (incorporating micronutrient supplementation, school meals, anthelmintic treatment, health education)		+	+	+		
Childhood disease-related interventions (treatment):	+	+	+	+	+	+
Acute respiratory infections		+		+	+	+
Diarrhoea			+	+	+	+
Causes of fever			+	+	+	
Malnutrition			+	+	+	
Anaemia				+	+	
Feeding/breastfeeding counselling				+		
Malaria prevention	*	+		+	+	
Insecticide-treated nets				+	+	
Residual indoor spraying					+	
Malaria treatment	*		+		+	
Tuberculosis treatment	*	+	+	+	+	
DOTS for smear positive patients				+	+	

Another interesting feature of this particular package is that it includes the institutional support necessary to achieve both individual health care as well as inter-sectoral interventions. This item included national management support, training, the development of district teams, and a financial incentive to retain staff in peripheral services. All in all, then, the package proposed by *Better Health in Africa* has more of the character of a plan for implementing cost-effective district health services than the more narrowly described package in *Investing in Health*.

The *Better Health in Africa* package was estimated to cost, in 2001 prices, roughly \$17 per capita per annum in low-income African countries, primarily in rural and peri-urban settings (this is slightly higher than the *Investing in Health* estimate). Fifty-nine percent (\$9.81) of this was devoted to personal health care, 30 percent (\$5.04) to inter-sectoral interventions, and 11 percent (\$1.90) to supporting services. It was estimated that in higher-income African countries, such as Zimbabwe, the package could cost 20 to 25 percent more, up to roughly \$20 per capita per annum.¹⁰ These estimates were based on the costs of well-functioning facilities and inter-sectoral programmes in several African countries, and included both recurrent and annualized costs of capital investments.

5.4 'THE WORLD HEALTH REPORT 2000'

The World Health Report 2000, published by the World Health Organisation, listed a number of interventions that are cost-effective (see **Table 5** in **Appendix 2**), but did not put a cost of this 'package,' or elaborate on how the methodology used to derive this list differed from the World Bank approach. The list expands on earlier lists by widening considerably the range of HIV/AIDS-related prevention activities (reflecting improved knowledge of the range of cost-effective interventions) as well as explicitly mentioning non-communicable disease screening and prevention (reflecting the growing awareness of the health transition being experienced in developing countries) (see **Table 4**). It is difficult to tell whether other discrepancies with earlier proposals reflect conscious decisions or simply differences in the level of detail contained within different proposals.

5.5 THE COMMISSION ON MACROECONOMICS AND HEALTH

In 2002, Working Group 5 of the Commission on Macroeconomics and Health published a report on its deliberations, entitled *Improving Health Outcomes of the Poor* (Jha and Mills 2002). The report reviewed the health sector interventions that could do most for the health of the poorest billion of the world's population (those living in all the countries of Sub-Saharan Africa and all other countries with a per-capita GNP below \$1,200 (1999 prices)),¹¹ and estimated the benefits and costs of increased provision of these interventions. The interventions reflect earlier thinking on packages, although HIV/AIDS-

¹⁰ This is because of the higher intensity of demand that results partly from higher levels of household education, reinforced by higher income levels.

¹¹ In 2001 prices these would be countries below \$1,255.

related interventions became more detailed. As with earlier packages, the report proposed that interventions be delivered through outreach services, health centres and local hospitals, which were referred to as ‘close-to-client’ health services to avoid the ambivalences present in other terminology.

The approach to deriving this list of interventions clearly differed from that used in earlier proposals for packages. First, there were modifications in the method for calculating the burden of disease: premature mortality alone was used and target life expectancies were lowered. Mortality was seen by the Commission as a key indicator for three reasons (Jha and Mills 2002). First, it frequently accounts for the bulk (roughly three-quarters) of the burden of ill-health as measured by more sophisticated approaches. Second, morbidity correlates reasonably closely with mortality in the conditions identified as the main problems (so measures to reduce mortality will tend to reduce morbidity). Third, data on mortality tend to be more reliable than data on disability. The Commission was at pains to note that the use of mortality is not meant to minimize the importance of injury and mental disorders (where there can be significant morbidity without mortality, and for which very cost-effective interventions are emerging).

With respect to cost-effectiveness judgements, these were based on a range of reviews that were themselves reviewed. Interventions were chosen if they were effective, capable of being scaled up relatively quickly and applied widely, and responsive to important epidemiological issues (see **Table 6** in **Appendix 2**). As in earlier calculations, however, non-health benefits were not considered.

Costs were estimated for scaling up 49 priority health interventions to target levels for 2015 in 83 poor countries. Apart from the recurrent and capital costs of the interventions themselves, four additional sets of expenditures were included. These were management costs generated at levels above the ‘close-to-client’ services, expenditure to improve absorptive capacity, expenditure on the improvement of the quality of care, and 100 percent increases in staff salaries to deal with the problems of staff recruitment and retention. It was estimated that an *additional* \$40 to \$52 billion annual expenditure would be required by 2015 to scale up the selected interventions to reach high levels of global coverage (and consequently achieve high levels of benefit). In 2001 prices, this would bring *total* per capita expenditure – including the public and private sectors - to \$41 in all countries (but \$40 in the poorest countries), from a base in 2002 of \$25 in all countries (but \$13 in the poorest) (see **Table 5** (the original 2002 prices appear in **Table 7** of **Appendix 2**)).

Table 5: Baseline annual per capita expenditure in 83 poor countries in 2002, and total projected expenditure to achieve 2015 targets (2001 prices)

COUNTRY GROUPING	2002 BASELINE EXPENDITURE	TOTAL EXPENDITURE IN 2015
Least developed	13	40
Other low-income	24	36
Lower middle-income	27	39
Upper middle-income	260	331
All countries	25	41

Source: Commission for Macroeconomics and Health (2001)

Table 6: A comparison of the total annual per capita costs of minimum packages calculated by different reports (2001 prices)

REPORT	Low-income countries	Middle-income countries
<i>Investing in Health</i> (1993)	15	27
<i>Better Health in Africa</i> (1994)	16-20	
Commission for Macroeconomics and Health (2001)	Least developed: 40 Other low-income: 36	Lower middle-income: 39 Upper middle-income: 331

Table 6 compares the cost estimates of the Commission for Macroeconomics and Health with those of the earlier reports, *Investing in Health* and *Better Health in Africa*. The most recent data suggest that, in low-income countries, a minimum package could cost around twice the amount estimated by the earlier reports. This is probably due, in the main, to the acknowledged need to extensively upgrade the capacity and quality of district health systems to deliver the package effectively. The fact that even the pared down packages of the mid-1990s are presently not affordable to most low-income countries, highlights the need for considerable aid to be channelled to such countries. It also highlights the importance of finding ever more efficient strategies for delivering these packages to populations, an issue which is dealt with in some degree in a later section. Interestingly, the report of Working Group 5 of the Commission for Macroeconomics and Health provided some examples of how interventions could be structured between levels of care (see **Table 7**). Here it was considerably more specific than *Better Health in Africa*, providing clearer guidance to country governments on how to organise the delivery of cost-effective interventions.

Table 7: Examples of intervention delivery by level of care, as proposed by the Commission for Macroeconomics and Health

Level of care	TB	Malaria	HIV/AIDS	Childhood diseases	Maternal/perinatal	Smoking
Hospital	DOTS for complicated TB cases	Tx of complicated malaria	Blood transfusion for HIV/AIDS; HAART Tx of severe OI for AIDS; Palliative care	IMCI: severe cases	Emergency obstetric care	
Health centre or post	DOTS	Tx uncomplicated malaria; Intermittent Tx of pregnant women for malaria	Anti-retrovirals plus breast milk substitutes for mother-to-child transmission; Prevention of OI, and Rx of uncomplicated OI; VCT; Tx of STIs	IMCI; Immunisation; Tx of severe anaemia	Skilled birth attendance; Antenatal and postnatal care; Family planning post partum	Cessation advice; Pharmacological therapies for smoking
Outreach services		Epidemic planning and response	Peer education for vulnerable groups	Specific immunization campaigns; Outreach IMCI: home management of fever; Outreach for micronutrients and deworming		
Outside health sector or not involving direct service delivery		Social marketing of ITNs	Condom social marketing; School youth programmes for HIV	Improving quality of private drug sellers; School deworming and micro-nutrients; Policies to reduce indoor pollution, information, regulation; Food fortification laws with iodine, iron, folate, potentially zinc		Higher tobacco taxes; Bans on advertising and promotion; Clear air laws; Counter-advertising

Source: Jha and Mills (2002:52)

5.6 'THE WORLD HEALTH REPORT 2002'

This report focused entirely on interventions against the major risk factors, many of which, at least amongst low mortality developing countries and developed countries, relate to non-communicable disease (see **Table 8**). This improved on the earlier work of *Investing in Health* which had acknowledged the limitations at that time with respect to data and methodologies pertinent to risk factors.

Table 8: Leading 10 selected risk factors in developing countries, as percentage causes of disease burden measured in DALYs

RISK FACTOR	PERCENTAGE CAUSE OF DISEASE BURDEN
<i>High mortality countries</i>	
Underweight	14.9
Unsafe sex	10.2
Unsafe water, sanitation and hygiene	5.5
Indoor smoke from solid fuels	3.7
Zinc deficiency	3.2
Iron deficiency	3.1
Vitamin A deficiency	3.0
Blood pressure	2.5
Tobacco	2.0
Cholesterol	1.9
<i>Low mortality countries</i>	
Alcohol	6.2
Blood pressure	5.0
Tobacco	4.0
Underweight	3.1
Overweight	2.7
Cholesterol	2.1
Indoor smoke from solid fuels	1.9
Low fruit and vegetable intake	1.9
Iron deficiency	1.8
Unsafe water, sanitation and hygiene	1.7

Note: Risk factors for which interventions are discussed in the report are highlighted in bold: further interventions are due to be considered in a subsequent report

Source: World Health Organisation (2002:102)

The report highlights a range of interventions or clusters of interventions that are highly cost-effective, but notes that their effectiveness varies according to circumstances (see **Table 9**). Many of the interventions are built on behavioural change that requires government intervention through, for example, legislation, tax or financial incentives. An important finding of the report is that combining such interventions with more individually-oriented ones is often highly cost-effective. The report does not propose a 'package' of risk-related interventions, nor discuss the relative priority of these interventions vis-à-vis interventions proposed in earlier packages. However, the report implies that a combined population- and individual-based approach is necessary to prevent the advent of ill-health, especially in adults. Of concern with respect to non-communicable diseases is that health systems in developing countries are seldom geared to deliver interventions against these sorts of conditions, even at the level of the individual. This will become increasingly problematic as the epidemiological transition progresses in many countries.

Table 9: Conclusions on cost-effective interventions against risks

STRATEGY	ASSESSMENT OF COST-EFFECTIVENESS
Strategies to protect the child's environment	<ul style="list-style-type: none"> • Cost-effective in all settings • Very cost-effective components: <ul style="list-style-type: none"> ○ Some form of micronutrient supplementation (depending on the prevalence, vitamin A, iron or zinc) ○ Disinfection of water at point of use to reduce diarrhoeal diseases ○ Treatment of diarrhoea and pneumonia
Preventive interventions to reduce incidence of HIV infections, including measures to encourage safer injection practices	<ul style="list-style-type: none"> • Very cost-effective, although care needs to be taken when extrapolating the effectiveness of behaviour change from one setting to another • Use of some types of antiretroviral therapy in conjunction with preventive activities is cost-effective in most settings • (Directly observed therapy combined with testing for resistance not cost-effective in all settings although there might be other reasons for pursuing this strategy)
Improved water supply based on disinfection at point of use	<ul style="list-style-type: none"> • Cost-effective in regions of high child mortality
Interventions to reduce the risks of CVS	<ul style="list-style-type: none"> • At least one type of intervention cost-effective in all settings • Population-wide salt and cholesterol lowering strategies are always very cost-effective, singly and combined • Combining them with an individual risk reduction strategy is also cost-effective, particularly with interventions to reduce risk based on assessed levels of absolute risk. • The cost-effectiveness of the absolute risk approach could improve further if it is possible to assess accurately individual risks without the need for lab tests, and further work towards testing is recommended • (Increased physical activity was not evaluated but should be considered as an additional strategy)

Source: World Health Organisation (2002:139-140)

6. THE CRITIQUE OF THE CONCEPT OF COST-EFFECTIVE PACKAGES

The concept of a cost-effective package, particularly as calculated and presented by *Investing in Health*, has come under criticism from several quarters. These criticisms, which fall into a number of categories, have particular implications for the design of primary care services, forming as they do such a large part of basic packages. All the criticisms raise the question of whether the recent dominance of cost-effectiveness as a criterion for determining service delivery priorities is appropriate.

6.1 THE METHODS FOR CALCULATING THE BURDEN OF DISEASE

Williams (1999) and Mooney and Wiseman (2000) question the value of global burden of disease estimates, largely because of the difficulty in attributing improvements in the burden to changes in the health system. In terms of methodology, Williams (1999) questions the value of cross-country comparisons given enormous differences in the circumstances of different countries, and challenges the discounting, age weights, and life expectancy approaches of *Investing in Health*. He questions, too, the values placed on different states of ill-health, and particularly the role of experts in determining these

values, emphasising the importance of lay opinion in understanding the community's assessment of the impact of ill-health. Mooney and Wiseman (2000) raise the need to reflect on values and how they are incorporated in such studies, appreciate the contextual impact on values of the setting in which ill-health is experienced, acknowledge the fact that changes in health are not valued equally by different communities, and understand that an individual's own assessment is not immune from the norms of wider society. Thus, while burden of disease methodologies appear highly technical, these commentators imply that they are highly 'value-laden'. Consequently, they fear that using burden of disease estimates to set priorities is both a diversion of scarce research resources and likely to lead to inefficient and inequitable resource use. They believe, like Williams (1999) that the real effort should be on determining the cost-effectiveness of interventions, most particularly those related to new technology.

Murray and Lopez (2000) and Musgrove (2000) willingly admit to the limitations in the *Investing in Health* methodology with respect to both the burden of disease and cost-effectiveness calculations. They identify further research needs to include more data of greater comparability, validity and reliability on the descriptive epidemiology of conditions, as well as improved methods for, and wider consensus on, the estimation of disability and application age weights. The greater use of sensitivity analyses is also proposed. The World Health Organisation's World Health Survey of 2002 is an example of experimentation with new methodologies around self-assessment of health. Nonetheless, these developments do not entirely address the concerns of the critics.

6.2 THE METHODS FOR ESTIMATING COST-EFFECTIVENESS

Investing in Health drew on the findings of a number of cost-effectiveness studies, but did not scrutinise the quality of these studies in detail. Subsequently, the prohibitive cost of these sorts of studies has led to a continuing interest in pooling data from different studies in order to generalise cost-effectiveness conclusions. However, Walker and Fox-Rushby (2000) found that only a relatively few studies on communicable diseases (107) were published in the developing world between 1984 and 1997. Categorising these studies they found that certain diseases and geographical areas had been neglected and that appropriate analytic techniques were inconsistently applied.

The problems with analytic techniques were several. First, the studies generally considered the health care provider perspective when calculating costs. This meant that costs to other groupings, especially patients, were neglected. If these costs had been included the conclusion of some of the studies may well have been different. For example, Khan *et al.* (2002), using a social perspective for an economic study conducted alongside a clinical trial at three sites in Pakistan, found that direct observation of TB treatment by health-centre based health workers was the least cost-effective strategy tested, because of the high costs of attendance faced by patients and their escorts. DOTS raised patient costs by 267 percent for urban patients and 207 percent for rural patients. These high costs, as well as related factors,¹² seemed to be

¹² Barriers to treatment as identified by patients included health-related problems, the time and costs associated with a round trip, excessive waiting time at the treatment centre, the unavailability of person to accompany them, social events (such as births, deaths, marriages),

detering patients from attending. This was particularly so for patients who had the most to lose from spending time under direct observation. Thus, one of the alternative approaches, self-administration, emerged as most effective. A sub-group that was observed directly by community health workers achieved the highest cure rate whilst being only slightly more expensive than self-administration. Khan *et al.* (2002:178) conclude that, 'without stronger evidence of benefits, it is hard to justify the costs to health services and patients that this type of direct observation imposes.' This case study illustrates the importance of perspective in economic evaluation, and also makes the point that many health service activities have become standard practice without evaluation.

The other analytic problems identified by Walker and Fox-Rushby (2000) are listed in **Box 6**, and apparently reflect similar problems identified by reviews of studies performed in the developed world. A review by Mulligan, Walker and Fox-Rushby (2003) of 32 economic evaluations of *non*-communicable disease interventions in developing countries (which had been published between 1984 and 2000) reinforces the findings of Walker and Fox-Rushby (2000). In addition, it was found that very little attention was paid by studies to the issues of affordability and sustainability, and that studies tend not to support policy decisions especially as outcomes are not measured in a way that can allow the comparison of range of interventions across health sector.

Box 6: Analytic problems with economic evaluations of communicable and non-communicable disease interventions (1984-2000)

1. The studies generally considered the health care provider perspective when calculating costs. This meant that costs to other groupings, especially patients, were neglected.
2. There was a reliance on intermediate outcome measures, which means that the cost-effectiveness with respect to achieving health status improvements had not been calculated.
3. Bias was evident in the sorts of costs that had been included. Donated costs, and some capital costs, had often not been taken into account.
4. The impact of time – both in terms of the annualisation of capital costs and the use of a discount rate – had been inconsistently applied.
5. There was a lack of transparency with respect to the sources of data.
6. There was an absence of critical examination of the findings, with many papers failing to perform a sensitivity analysis.

Source: Walker and Fox-Rushby (2000), Mulligan, Walker and Fox-Rushby (2003)

6.3 THE USE OF COST-EFFECTIVENESS FINDINGS TO DETERMINE SERVICE PRIORITIES

6.3.1 *The generalisability of cost-effectiveness findings*

Paalman *et al.* (1998) question the usefulness of global exercises to inform national priority-setting, because of the influence of local economic, political, cultural and infrastructural factors on health systems, access to health care, and the burden of

job/occupational reasons, the unfriendly attitude of staff, and the lack of support by 'significant people'.

disease. Mulligan, Walker and Fox-Rushby (2003:1,12) conclude from their review that ‘the quality of studies was poor and resource allocation decisions made by local and global policy-makers on the basis of this evidence could be misleading ... Overall, it seems that the existing evidence base from developing countries is very unlikely to be able to challenge effectively any resource allocation decisions made on the basis of burden of disease estimates without a great deal more investment in the number of economic evaluations across countries and health interventions.’ The ‘WHO-CHOICE’ project is engaged in developing improved standards for cost-effectiveness analysis as well as league tables that allow comparison of results between regions, but Mulligan, Walker and Fox-Rushby (2003) make the point that research studies should not just increase in number. More research needs to be performed that investigates the causes of variation among cost, effect and cost-effectiveness data within and between settings (some of these are presented in **Box 7**, many relating closely to the cultural and economic contexts of settings). More research also needs to be performed on assessing and testing the transferability of findings between settings. A recent WHO randomized trial of a new model of antenatal care is cited by Fox-Rushby (2003) as an example in this regard. Until the evidence base is much more secure, then, the implication is that cost-effectiveness information should be used with circumspection in priority setting. As mentioned before, it is probably most useful in assessing new technology, and in refining existing interventions.

Box 7: Causes of variation in cost-effectiveness calculations between settings

- | |
|---|
| <ul style="list-style-type: none"> Epidemiological environment Prevalence of condition Incidence of condition Existence of competing risks or synergisms Individual characteristics Age Tendency to compliance Tendency to self-refer Level of risk factors Individual variation in values System characteristics Local cost of non-traded inputs to health care system Generalisable systemic competence Discount rate |
|---|

Source: Adapted by Mulligan, Walker and Fox-Rushby (2003) from Jamison *et al.* (1993)

6.3.2 Primary care as integrated and responsive

For several critics of *Investing in Health*, cost-effectiveness simply cannot capture the value of primary care services as envisaged by the ‘Primary Health Care Approach.’ First, Paalman *et al.* (1998) feel that, despite the concept of ‘a package,’ the listing of individual interventions will promote vertical and ineffective programmes. For Pinotti *et al.* (2001), this leads to missed opportunities for screening, treatment and diagnosis for conditions that are not necessarily the presenting complaint of the patient. In turn, this prevents the achievement of economies of scale and scope, and wastes opportunities to prevent further ill-health at an early stage. However, for Bobadilla *et al.* (1994)

verticalisation was not the intention behind the package, and Musgrove (2000) feels that the impact could be quite the opposite (see the examples of Bangladesh and Tanzania later). Musgrove (2000:113) argues that 'the reason for including the size of the burden as a criterion for priority setting is precisely that health systems in poor countries often cannot efficiently administer a large collection of programmes, and dissipate their resources trying to do so. In consequence, it makes sense to maximise the health gains from a small number of interventions, economising on scarce managerial and administrative capacity.'

However, the tendency of governments and donors to promote vertical programmes must be acknowledged. As Pinotti *et al.* (2001:76) provide by way of an example, 'we cannot ignore the many obstacles to initiating and achieving an integrated approach to reproductive health care. The medical community has not always reacted positively to the delegation of functions. The structure of the public health system is not well adapted to this kind of approach either, but tends to prefer to deal with one health problem at a time ...International organisations are always pressing developing countries to deal with women's health in terms either of family planning projects of safe motherhood projects, while considering a more integrated approach as too complicated and ambitious and objective.'

A second argument against cost-effectiveness as a predominant criterion in priority-setting is one that contests that health services are purely concerned with the reduction of death and disability. Critics ask what is to be made of other criteria, such as 'the rule of rescue,' respect for patient autonomy, a dignified death, the satisfaction of having access to screening services, and wellbeing improvements arising from the knowledge that services are universally available. Mooney and Wiseman (2000:370) write that 'there is so far to go to embrace all that is relevant. Care is needed to avoid driving out these intangible issues, and letting the measurable dominate or even monopolize the objective function ... There is no reason why a benefit or cost that is difficult to measure should be considered less important than one that is easily quantifiable, and to give priority to generating easily measured benefits is to distort priorities systematically.' The key question for Mooney and Wiseman (2000:370) is understanding 'what is the nature of the good that the community wants delivered by its health services.'

Paalman *et al.* (1998:24) concur that 'the package arrived at by experts might not be acceptable to the public, and hence less cost-effective in the end.' Pinotti *et al.* (2001:70) provide the example that, 'although the main complaints women had [at a hospital outpatients department in Brazil] were vaginal discharge, menstrual or sexual disorders, need for contraception, abdominal pain and breast lumps, national priorities were linked with maternal mortality and family planning.' Musgrove (2000:114) agrees that 'this raises the general, and severe, problem of needs and wants not necessarily coinciding, and points to the urgency of finding out whether and why people may not use existing health services and reforming those services so as to attract the beneficiaries they are meant to help.' Although this point may go some way to assuage critics' concerns, it does not fully acknowledge that some services at the primary level may have high value *despite* the fact that they are not highly cost-effective.

6.4 ACHIEVING EQUITY

Paalman *et al.* (1998) note that 'the fact that the most efficient interventions ... tend to specifically benefit the poor is more a result of coincidence than of principle.' Musgrove (2000) quotes Gwatkin and Guillot (1998) as substantiating this finding more fully. Thus, the cost-effectiveness approach does not intrinsically protect equity.. Indeed, as mentioned earlier, cost-effectiveness principles might argue against the extension of services to populations in remote areas, as the cost of delivery increases in such circumstances. *Investing in Health* (World Bank 1993), Bobadilla *et al.* (1994) and (Musgrove 2000) all emphasize that governments need to make explicit choices between equity and efficiency concerns. This trade-off is easier to manage in wealthier countries where resources are not so scarce. In addition, when the cost-effectiveness approach is combined with the burden-of-disease approach, as advocated by *Investing in Health*, the equity-efficiency trade-off is tempered. These authors also argue that, access by the poor to cost-effective services can be promoted through a variety of financing mechanisms that give priority to the poor either because they are sicker or less able to pay. While they recognise the importance of incorporating distributional concerns within priority-setting processes, they emphasise that *within* poor populations services should be prioritised only according to cost-effectiveness considerations. Clearly, then, the *Investing in Health* approach is based on the principle that health care interventions, rather than population groups, should be prioritised. This ignores the other dimensions of priority-setting, especially equity considerations.

This approach concerns several critics, for whom the principles of vertical and horizontal equity should receive high priority (for example, Paalman *et al.* 1998, Almedia *et al.* 2001). The suspicion that the cost-effectiveness approach might run counter to equity goals is compounded by the association the World Bank (and particularly *Better Health in Africa*) has with the concept of user fees, a financing mechanism which in some cases had a negative impact on equity (see, for example, Gilson 1998).

Rannan-Eliya (2001:37) rejects the cost-effectiveness approach, stating that 'cost-effectiveness of interventions and a disease-focused approach to allocational efficiency are irrational and inefficient guides to resource allocation and may lead to erroneous use of resources.' He states on the basis of the Sri Lankan experience that 'unless equity of access is the highest priority, choices about rationing will be made which inevitably hurt the poor' (Rannan-Eliya 2001:36). Sri Lanka enjoys a superior health status for its level of economic development. This has been achieved without reliance on the cost-effectiveness approach: from 1930-1985, 'despite spending less than 25 percent of its health budget on [minimum cost-effective package] services and less than one-eighth in dollar terms of the minimum expenditure level [set by the World Bank], Sri Lanka achieved more than double the DALY-gain promised by the World Bank/WHO' (Rannan-Eliya 2001:30). Rannan-Eliya (2001) ascribes this success to a mixture of pro-equity policies, the tailoring of services to take account of what is available in the private sector, and the provision of hospital care to mitigate the impact of catastrophic illness.

This last point – the need to mitigate the impact of catastrophic illness - takes account of the welfare, and not simply health, benefits of health care interventions. For example, a review of cost of illness and coping strategies (with a focus on malaria, tuberculosis and HIV/AIDS) (Russell 2003) found that the direct costs of illness to households was

generally between 2.5 and 7.0 percent of household income, while the indirect costs of illness were often as significant – or even more significant – than direct costs. Ensor *et al.* (2002:255) comment that “it is therefore apparent that while more resources for ESP [essential service packages] may increase the use of effective primary services, it has very little impact on household exposure to financial risk through illness.’

However, whereas there is a strong argument for prompt and appropriate hospital-based care to allow some of these costs to be avoided, in the long-term one would want primary care and other services to reduce the need for hospital care. For example, the World Bank (1994:5) found that ‘when offered by well-functioning health centers, the ... package has reduced total hospital admissions in some communities in Africa by up to 50 percent and has cut hospital admissions for such illnesses as measles, tetanus and diarrhoea by up to 80 percent’.

6.5 IMPLEMENTING PRIMARY CARE SERVICES

While critics of the cost-effectiveness approach – or at least of its dominance – worry about its value basis and methodological flaws, implementers face the vexing question of how to deliver services on the ground. As late as 2001 Pappas and Moss (2001) write that ‘despite many efforts at the WHO and other agencies, primary care services have been inadequately funded and poorly maintained in many countries, and the results have been disappointing. Sustainability of health systems has often been impeded by a lack of health policy and management.’

The challenges to implementation appear so vast (see the case study from Cameroon presented in **Box 8**) that the finer details of cost-effectiveness controversies must seem almost immaterial to managers working at the district level. Simply improving the effectiveness of district health systems would automatically improve the cost-effectiveness of interventions in general. Some of the frustration felt by critics of the cost-effectiveness approach appears to result from a sense that research efforts are disproportionately focused on perfecting burden of disease estimates and economic evaluation techniques, when the more pressing problems lie within the field of health systems research. In commenting on the experience of the IMCI strategy, Bryce *et al.* (2003) draw the important distinction between individual interventions and ‘delivery strategies,’ commenting that more intensive efforts need to be focused on improving the latter.

The next section examines some country experiences of the implementation of packages, in order to assess the extent to which health system problems impact on the usefulness of the concept. Suffice it to say here that many factors need to conspire to ensure successful primary care delivery. Thus, for example, Nitayarumphong (1990) attributes the success of primary health care in Thailand to an array of factors, including community involvement in health, collaboration between government and non-government organizations, the integration of the PHC programme, the decentralization of planning and management, inter-sectoral collaboration at operational levels, resource allocation in favour of PHC, the management and continuous supervision of the PHC programme from the national down to the district level, as well the ‘horizontal training’ of villagers to villagers.

Box 8: Problems in implementing primary care services: the case of Cameroon

Limitations of the PHC policy adopted in 1982 following the Alma Ata Declaration

- ***Problems within the health services*** (e.g. poor referral systems, neglect of health promotion activities at the expense of curative services, inconsistent care due to poor training)
- ***Problems at the community level*** (e.g. lack of support for the concept of community health workers, pressures to upgrade facilities, sustainability problems resulting from community health workers requiring reimbursement)
- ***Problems with the interface between the community and the health services*** (e.g. failure of the community health committees, lack of consultation with community health workers)
- ***Problems at the delivery level in the health sector*** (e.g. poor co-ordination, supervision and training)

Limitations of the re-orientation of primary health care in 1989

- ***Inadequate legal framework*** (e.g. lack of legislation regarding cost recovery based on the sale of medicines, the formal organisation of communities into committees and revenue retention, as well as the absence of a formal national health policy)
- ***Incompatibilities between the political structure and the new health structure*** (e.g. the different definitions of districts)
- ***Incompatibilities between the goals of the new health policy and the organisational chart of the MOH*** (e.g. inadequate restructuring, overlapping functions)
- ***Absence of a critical mass of trained personnel in health management***
- ***Too highly centralised management with poor co-ordination of human resource management***
- ***The slowness of the extension of the primary health care coverage***
- ***Inability of the system to assure the availability of, and easy accessibility to, medicines***
- ***Inadequate health information system***
- ***Poor promotion of the new policy***
- ***Poor co-ordination of operations research***

Source: Adapted from Essomba, Bryant and Bodart (1993)

7. THE IMPLEMENTATION OF MINIMUM PACKAGES: THREE CASE STUDIES

Ensor *et al.* (2002:248) note that 'it is a little surprising that so little evaluation [of essential service packages (ESPs)] exists, given that the introduction of ESPs might be seen as the largest experiment in the use of evidence-based clinical practice and cost-effectiveness analysis in priority setting within the health sector.' Indeed, this review could only find two published evaluations – one by Ensor *et al.* (2002) in Bangladesh, and the other by the Bamako Initiative in Benin and Guinea.¹³ A third evaluation would

¹³ A report does exist evaluating the overall impact of the Bamako Initiative but this review was unable to access it.

be that of 'TEHIP' (the Tanzania Essential Health Interventions Project), which utilises a number of decision-making tools in planning and refining district services, but this has not yet published final findings. However, this review is able to present a brief overview of the impact of TEHIP written by Don de Savigny, former Research Manager for TEHIP.

7.1 THE BAMAKO INITIATIVE:

The Bamako Initiative was launched by the African Ministries of Health. It built on regional experience following Alma-Ata which raised the issues relating to the delivery, affordability and sustainability of primary care services. The initiative, which was adopted in several countries, combined the concept of cost-effective minimum care packages with health centre and district revitalisation, rationalization of resource use and management, and community outreach, co-management and cost sharing. In Benin and Guinea the effectiveness of the programme – and of the integration of curative and preventive services - was demonstrated by the simultaneous increase of coverage for all the interventions covered in the package. Importantly, this was achieved within existing resource constraints. Further, the gradual improvement of coverage between 1989 and 1993 showed that reorganized health centres can yield benefit for many years.

Box 9 provides an extensive description of how this was achieved. A central characteristic of the approach was the development and implementation of the package taking account of local circumstances. New interventions were included over time in response to both public health needs as well as community demands. Levy-Bruhl *et al.* (1997:77) state that 'the dynamic process of local and participatory problem-solving approaches through monitoring of coverage, identification of problems and micro-planning of solutions is probably one of the most important factors for success.'

The median cost per capita per year of delivering the package was US\$1.2 in Benin and between \$0.7 and \$1.0 in Guinea which had lower salaries and incentives (2001 prices). These costs were consistent with the experience of the Bamako Initiative in other countries (see **Table 10 (Table 8 in Appendix 2** gives the costs in the original 1993 prices)). In Benin and Guinea, the cost varied very little between regions, cost centres and over time. Variations in cost-effectiveness were caused by the levels of coverage achieved, and improved over time, as did affordability. Soucat (1997) concludes that 'the evidence shows that integrated PHC of acceptable quality can be delivered by health centres for around \$1.2 to \$2.5 per person per year', and notes that this is far lower than the *Better Health in Africa* estimate.¹⁴ Soucat (1997) attributes this difference to the integration of services in the Bamako Initiative sites (the World Bank had compiled its estimates by summing the costs of national programmes for different interventions), and predicted that immediate cost-effectiveness gains would be felt if new services were added to existing services in Benin and Guinea, because of economies of scope.

¹⁴ It is difficult to know to which aspects of the *Better Health in Africa* estimates these figures are being compared. The direct health centre costs estimated by *Better Health in Africa* were \$6.2 per capita, but this excluded support by the district management team, which was included in the Bamako Initiative estimates. However, the *Better Health in Africa* costs may have included more extensive services at the health centre level. The costs estimated by the Bamako Initiative appear to represent the full costs faced by health services in delivering services (and not the costs after cost-recovery from patients, a strategy for which the Bamako Initiative is best known).

Box 9: Operational strategies to improve effectiveness under the Bamako Initiative in Benin and Guinea

- (i) The essential health care package was developed.
- (ii) Health centres were identified as the basis for revitalizing the health system as they are the first point of contact.
- (iii) Obstacles to availability, accessibility and utilization of health services were identified by health centre personnel, community groups, the Ministry of Health and donors.
- (iv) Activities were prioritised to respond to the most important causes of morbidity and mortality in each area in order to maximize the impact of health status with very limited resources (mainly focusing on the most vulnerable members of the population, pregnant women and children):
 - o childhood vaccinations;
 - o growth monitoring of young children;
 - o antenatal and prenatal care (including tetanus toxoid vaccination, iron supplementation, and routine malaria prophylaxis);
 - o oral rehydration for diarrhoea;
 - o curative care: malaria and acute respiratory infection and, in response to community demands, other curative services were added such as treatment of parasites and sexually transmitted infections;
 - o Vitamin A deficiency reduction was not included initially because related health problems were minimal, although Vitamin A supplementation was introduced later; and
 - o STI and HIV/AIDS treatment was later included in Benin in response to community demands.
 - o (Promotion of breastfeeding was not included because related health problems were minimal).
- (v) Curative and preventive care responsibilities were integrated so that each health worker dealt with all aspects of care provided to each patient.
- (vi) Outreach sessions had a positive impact on effectiveness. However, outreach became difficult where populations were very scattered, which prevented sufficient frequency of visits to offer continuity. This demonstrated the need for intensified follow-up and, in some cases, additional infrastructure and personnel.
- (vii) The continuity of care was improved through improved tracking of patients.
- (viii) The availability of essential resources such as drugs and vaccines was improved through achieving good local management and proper functioning of logistical support, built on the consensus of partners at all levels to support the initiative.
- (ix) Diagnostic and treatment practices were improved through the development of decision trees with active involvement of local nurses, as well as the development of risk screening.
- (x) Referral infrastructures to district hospital were organised for obstetric emergencies.
- (xi) Monthly supervision on all aspects of health centre functioning was organised.

Source: Knippenberg *et al.* (1997b), Levy-Bruhl *et al.* (1997)

Table 10: Health centre operating costs per capita and per year within the Bamako Initiative in some African countries, 1989-1999 (2001 prices)

COUNTRY	TOTAL COST PER CAPITA (\$)
Benin	1.20
Guinea	0.82
Guinea-Bissau	0.70
Mali	1.51
Senegal	2.91
Zaire	1.29
Cameroon	0.33

Source: Soucat *et al.* (1997)

This apparent success was not without its problems, however. Equity problems were experienced with respect to access to curative services, and the location of some health centres distant to the populations they serviced posed a constraint, outreach services notwithstanding (Knippenberg *et al.* 1997a). In addition, the fact that curative utilization rates stagnated at 0.3 visits per capita per year raised the question of whether the package was responding adequately to community needs. Knippenberg *et al.* (1997a) identified the need for more research into this area, especially in relation to diarrhoea and malaria, as well as the need for further quality of care improvements.

7.2 **BANGLADESH**

The Bangladesh experience is not as unequivocal as that described by the Bamako Initiative. In 1998 Bangladesh began a sector-wide approach to extending health care to vulnerable populations, especially through an essential service package emphasising maternal care, certain communicable diseases and child health (see **Box 10**). The package was designed to improve population health status through a targeting approach which singled out facilities used more by the poor, effective services for diseases borne proportionately more by the poor, and rural areas where population health is the lowest. That is, the assumption was that improvements in health status could be supply-led. Evidence for the components of the package was mainly drawn from international cost-effectiveness studies, although some studies were conducted locally, while local cost estimates were developed for all interventions.

Box10: Components of the essential services package in Bangladesh

- (a) Reproductive health care – including safe motherhood (essential obstetric care, antenatal and post-natal care), family planning, other reproductive services including sexually transmitted diseases;
- (b) Child health care – including acute respiratory infections, diarrhoeal diseases, vaccine preventable disease and adolescent care implemented through an integrated management of sick child approach;
- (c) Communicable disease control – including tuberculosis, leprosy, malaria, filarial, kalazar and emerging diseases;
- (d) Limited curative care – concentrating on first aid for trauma, medical and surgical emergencies, asthma, skin diseases, eye, dental and infectious ear diseases;
- (e) 'Behaviour change communication' is being implemented as a way of influencing health behaviours and health-care-seeking practices across all of the ESP components.

Source: Ensor *et al.* (2002)

Ensor *et al.* (2002) find that the package has resulted in a diversion of more resources to priority services and primary care (the package accounts for 65 percent of total funding for the health sector). However, organizational and institutional rigidities still hamper resource flows at a local level, while considerable barriers to access by the vulnerable still persist. Ensor *et al.* (2002) found that the unit costs of the package varied ten-fold across 20 areas studied, and that more than 85 percent of this variation could be attributed to variance in the number of patients treated at the facility. This suggests that differences in the factors affecting demand, such as distance, information and perceived

quality, are at play, rather than differences in resource availability. Ensor *et al* (2002) judge that improving the targeting of services requires greater emphasis on the process of achieving greater access to key services. 'A more radical and wide-reaching approach is now required that attempts to communicate wider messages about quality use of health services – particularly the appropriate use of drugs and knowledge of the referral chain' (Ensor *et al.* 2002::254). ' (Ensor *et al.* 2002::253) concludes that 'the package approach to essential services suggests a world of insurer-purchasers where activities and outputs can be well specified and appropriate incentives are in place to ensure that activities are carried out. Yet in Bangladesh, and indeed most other countries where the ESP is being promulgated, systems do not work in this way.'

7.3 TEHIP

TEHIP had its roots in *Investing in Health*. It intends to 'test how and to what extent evidence can guide decentralised planning of the health sector at district level' (de Savigny *et al.* 2002), and must be considered the premier evaluation of the basic package approach. Amongst TEHIP's activities is 'measuring the costs and evaluating the effectiveness of the delivery of these health interventions in order to determine the degree to which their integrated implementation reduces the overall burden of disease' (Kasale 2003). **Box 11** describes some of the health systems activities of TEHIP in more detail.

Box 11: TEHIP: improving decentralized technical and allocative efficiency

The emphasis on decentralization and SWAp health-basket funding in the mid-1990s quickly illuminated the challenge of how district-level health systems could do evidence-based health planning that would improve the technical and allocative efficiency of local choices with respect to resource allocation and service provision. In Tanzania this was taken up by a large-scale demonstration project run by the Ministry of Health, called the Tanzania Essential Health Interventions Project (TEHIP) (Finlay *et al.* 1995). This study ran from 1997 to 2004 involving districts with a combined population of over 700,000 people.

TEHIP benefited from a parallel health research program that followed health system changes, health-seeking behaviour trends, and health impacts. It also had a research and development component tasked with inventing practical tools for decentralized planning that would address needs arising during district health planning and priority-setting. The latter added a number of tools and processes into the district-planning toolkit including:

- 1) an annual **District Health Intervention Profile** that provided a graphical display of the regional burden of disease in terms of intervention-addressable DALY shares from sentinel demographic surveillance systems;
- 2) a computer-based **District Health Accounts** tool that allowed districts to do budget and expenditure mapping in terms of allocation of health resources;
- 3) a computer-based **Health Mapping** tool that could be used at a district level to visualize Health Management Information System data from community and health facility levels;
- 4) a **District Integrated Management Cascade** process that improved the efficiency of supportive supervision of health services;
- 5) a **Community Ownership of Health Facilities Strategy** that freed up resources to renovate physical infrastructure; and
- 6) a number of capacity building processes for strengthening **District Health Management and Administration** (de Savigny *et al.* 2002).

www.idrc.ca/tehip

Local data on intervention costs and coverage are generally not available for district planners. Hence, local cost-effectiveness analysis is difficult to apply in decentralized priority-setting. In TEHIP, priority-setting was driven more by the shares of the burden of disease that cost-effective interventions could address. Cost-effectiveness was used only to eliminate interventions known to be grossly cost-*ineffective*. It was not used to prioritize or rank interventions generally considered to be highly cost-effective (e.g. costing less than the GDP per capita per DALY averted).

The net effect of decentralized basket funding plus the health system inputs described in **Box 11** was: 1) a proportional and absolute increase in resources for more efficient delivery of prioritized, cost-effective interventions addressing the largest shares of the local burden of disease (e.g. integrated management of childhood illness for under-five care, insecticide-treated mosquito nets for malaria prevention, syndromic management of sexually transmitted diseases for HIV prevention, TB DOTS, etc.); 2) an increase in the utilization of government health services; and 3) a decrease in mortality in infants, children under five, adolescents and adults. This was achieved with relatively limited resources. The district health systems received health-basket incremental funding of about US \$0.92 per capita per year additional to conventional district health budgets that covered salaries, supplies, drugs and vaccines (de Savigny, personal communication). According to a National Health Accounts exercise, the average health expenditure per capita in Tanzania at the mid-point of this study was US \$11.37, of which 47% was private out-of-pocket expenditure (Ministry of Finance 2001).

Early indications from TEHIP are that gross technical and allocative inefficiencies are relatively easy (and necessary) to address once incremental funding is available, and that doing so has a quick benefit. As seen in the Bamako Initiative, a dynamic process of using local (rather than national) information coupled with local problem-solving, planning and ownership was vital for appropriate decision-making and consequent implementation. This required new tools to focus resource allocation on major intervention-addressable burdens of disease through targeted sets of cost-effective interventions rather than a disease-by-disease or detailed cost-effectiveness approach. Generalised strengthening of the district health system through basket funding investments was also necessary to ensure that interventions were delivered more efficiently. 'One of the prime health indicators in the Millennium Development Goals is the target to reduce the 1990 under-five mortality by 2/3 by 2015. In Tanzania, the TEHIP districts have already reduced their 1997 under-five mortality by over 40% by 2003. At this rate of improvement, they will almost certainly achieve this MDG target ahead of schedule, within already available resources. This performance is a consequence, not of a single intervention done well, but of focused incremental improvements in technical and allocative efficiency for existing interventions through greater attention to optimizing the decentralized district health system' (de Savigny, personal communication).

8. DEVELOPING A PRIMARY CARE PACKAGE ON THE BASIS OF 'GOOD PRACTICE': THE CASE OF THE 'NEED NORMS PROJECT' IN SOUTH AFRICA

An alternative to assembling a primary care package from a list of cost-effective interventions that have been identified through separate studies, and sometimes under conditions that are not easily generalisable, is to construct a package on the basis of experience of 'good practice.' The 'Need Norms Project' attempted such an exercise in South Africa during the mid-1990s (Rispel, Price and Cabral 1996). The project identified five 'above average' primary care sites spread across urban and rural areas. Criteria for selection included discrete catchment areas, good demographic data, minimal barriers to access, a reasonable quality of care and favourable community perceptions.

Current utilisation rates were measured as a proxy of need. Where optimal services or access did not exist, a normative rather than empirical approach was used. This entailed reference to professional opinion, especially for services which were particularly under-developed, such as women's health, mental health and rehabilitation. The combination of empirical with normative data – and the modification of consequent service targets through the application of explicit principles to achieve affordability – resulted in a detailed package linked to data on financial, human and physical resource requirements which in turn took into account issues such as variation in geography and human resource productivity (see **Table 11**).

What was the role of cost-effectiveness in the development of the package? Rispel, Price and Cabral (1996) specifically set aside the cost-effectiveness approach as the basis for determining a primary care package, presenting some of the criticisms cited in an earlier section. However, they did give first priority to services of proven cost-effectiveness. This influenced the frequency and selection of interventions. Thus, it was decided that preventive services should be better targeted (for example, developmental assessment focussed on at-risk rather than all children), the target number of antenatal visits was reduced to 4 for low-risk pregnancies, and the frequency of visits for stabilised chronic patients was reduced from monthly to three-monthly (Daviaud 1997).¹⁵

Knowledge of cost-effectiveness presumably would have also influenced both current practice as well as professional opinion, impacting on the findings of the project through an indirect route. Clearly though, demonstrable cost-effectiveness would have been much less of a determining factor than, for example, collective experience of 'what seems to work' and consensus with respect to the range of services that a country ought to provide to meet the needs of its citizens as comprehensively as possible.

¹⁵ Rispel, Price and Cabral (1996) also identified cervical screening, mental health screening and counseling, and rehabilitation as interventions that require economic evaluation as their cost-effectiveness was uncertain.

Table 11: Target primary health care package for a middle-income country (South Africa) as defined by the 'Need Norms Project'

SERVICE CATEGORY	COMPONENTS	TARGET ANNUAL UTILISATION RATE
Child health (preventive and promotive)	11 preventive visits (for EPI and growth monitoring) over 5 years; 90% coverage	2.10
Under 5 curative care	12 curative care visits over 5 years; 90% coverage	2.16
Combined services for children under 5	90% coverage and 30% overlap for preventive and curative care visits	3.44
Combined services 5-14	1 visit for preventive care and empirical utilisation rate of 1.8 per child aged 5-15 per year for curative care; coverage 90%	1.71
Chronic care for children under 15	6 visits to the health service for asthma and epilepsy; 4 visits for intellectual disability; 70% coverage	0.58
Family planning	Equal distribution of oral contraceptive, injectable and IUCD use, rather than the present use skewed towards injectables; minimum number of 4 visits for oral contraceptives, 5 for injectables and 1 for IUCD; 66% coverage	2.18
Antenatal care	4 visits for multigravidae, 6 visits for primigravidae and high risk pregnancies; 90%	4.18
Deliveries	90% of women assisted during delivery in urban areas and 75% in rural areas	(urban) 0.90 (rural) 0.75
Postnatal care	One visit within first week; 90% coverage	0.90
Termination of pregnancy	Abortion rate of 15 per 1000 total population; coverage 80%	0.05
Screening for carcinoma of the cervix: family planning users, antenatal care users, other users	12% of women to be screened each year; 100% coverage for family planning and antenatal care users, 50% coverage of non-users of women's health services	(family planning) 0.08 (antenatal care) 0.12 (non-users) 0.02
Adult acute curative care (excl. STIs)	Empirically derived rate on 1.06	1.06
After hours/casualty care (medical and surgical)	Empirically derived rate of 0.2	0.2
STIs	-Screening for STIs in family planning and antenatal care services, taking account of the incidence of STIs among attenders as well as the additional visits needed for treatment and/or check-up (1 in the case of family planning and 2 for antenatal care) -Incidence of STIs in the general population; 1 visit to diagnose; coverage 90% -Contract tracing of 50%	0.20
Chronic adult curative care	Empirically derived rate; 60% coverage	1.2
Tuberculosis care	-Prevalence of TB infection of 30%; annual clinical conversion rate of 0.0025 -Desired detection rate of 70%; 80% of cases treatable at primary level -Desired caseholding of 85% -Minimum number of visits which takes account of both clinic-based and direct observed therapy for the following target groups: <ul style="list-style-type: none"> o New cases who start full treatment o Non-attenders who leave the systems after 3 months o Re-infections and relapses 	0.03
Care for persons with AIDS ¹⁶	Based on the estimated prevalence rate of AIDS for the year 2000, 100% demand for care, 90% of cases can be treated at primary level, and an average of 3.04 visits per person with AIDS per year	0.0093
Mental health care <i>Low screening</i>	Services for acute mental health conditions based on the following targets: -Target level 1 assumes a minimum level of coverage for screening (10%) of individuals who attend services listed in column 1, as well as	0.36

¹⁶ Rispel, Price and Cabral (1996) specifically identify interventions for HIV/AIDS care and prevention as a possible area where norms could change over time as new options become available.

<i>High screening</i>	follow-up and post-screening counselling of a % of these -Target level 3 assumes an ideal level of coverage for screening (50%) of individuals who attend services, as well as follow-up and post-screening counselling of a % of these individuals Chronic psychiatric care based on 1% prevalence at primary level; 12 visit per person per year; 30% coverage (low screening) and 80% coverage (high screening)	1.72 (low) 0.037 (high) 0.096
Rehabilitation care	(rates were not developed but the services were described)	
ALL SERVICES		3.74

Source: Rispel, Price and Cabral (1996:170-171)

In addition, when data from the Need Norms Project were used to develop a 'core package' of PHC services for the post-apartheid government, equity and comprehensiveness were chosen as the fundamental principles on which the package was based, the aim being to produce a package that influenced the organisation of services to be patient- rather than condition-oriented (Daviaud 1997).

The advantages of the approach embodied by the 'Need Norms Project' include this sense of the comprehensive and the practically achievable, as well as cognisance of economies of scale and scope. It also allows service targets (such as utilisation rates and coverage) to be linked directly to the financial and resources required, the configuration of facilities, and systems requirements. In particular, it strengthens the concept of integrated primary care (and possibly distinguishes more incisively between what is delivered at primary and district hospital level).

The disadvantages might include a tenuous link in some cases with evidence based on cost-effectiveness, although the continual injection of cost-effectiveness knowledge into practice – especially through the use of modern treatment protocols – could limit this deficiency. Like the cost-effectiveness approach, this approach needs evaluation. In addition, the norms developed in one country might not be applicable to be another. However, repeating this sort of exercise in a wide range of different countries could well be cheaper, methodologically simpler, and more informative from a planning perspective than the replication of numerous cost-effectiveness studies. This approach cannot replace cost-effectiveness studies entirely, though. These have a unique role to play, as discussed in a later section.

Another disadvantage of the 'Need Norms' approach might flow from its very comprehensiveness. Experts will tend to motivate for the inclusion of more services than might be affordable. However, in 1999 an updated per capita cost for the 'Need Norms' package was estimated by Brijlal and Hensher (2000) to be \$21 (2001 prices) (see **Table 12**). This is lower than the actual per capita expenditure of \$24 (in 2001 prices) estimated by a National Health Accounts exercise to be spent on primary care in that same year, although the latter figure includes some capital expenditure (Doherty, Thomas and Muirhead 2002). Two other estimates for the cost of a differently defined package (developed in the district of Hlanganani) are slightly cheaper than the 'Need Norms' project while a third model, developed in the Eastern Cape Province, is considerably more expensive (Brijlal and Hensher 2000).

Table 12: Estimates of the cost of the primary care package for persons without health insurance in a middle-income country (South Africa), using various data sources

SOURCE OF ESTIMATE	PER CAPITA COST (2001 prices)
	\$
Hlanganani district study: target utilisation rate of 2.8 visits per annum (which would not require additional staff or infrastructure)	19
Hlanganani district study: target utilisation rate of 3.5 visits per annum	20
Need Norms Project: utilisation rate of 3.5 visits per year	21
National Health Accounts Project (utilisation rate unknown)	24
Data from Eastern Cape Province	25

* This includes spending on district hospital outpatient departments, which is probably not included in the other estimates

Source: Brijlal and Hensher (2000:8), converted to \$(2001 prices)

All in all, though, it appears that a comprehensive package of primary care services, developed along the lines of the Need Norms Project, is affordable to South Africa. In addition, the cost of the 'Need Norms' package compares very well with costs estimated by *Investing in Health* for middle-income countries, while seeming to offer more comprehensive cover.¹⁷ That services on the ground in South Africa do not presently resemble such a package despite adequate funding probably results from the geographic mal-distribution of resources, as well as various inefficiencies in delivery.

A final disadvantage of the Need Norms package, and the planning tools and 'core package' to which it gave rise, is that it has never been implemented either as an official policy or as a benchmark against which services are planned. While some of the reasons for this are peculiar to the South African situation, other reasons relate to the more generic challenge of translating general guidelines into district-specific strategies, a challenge shared by packages developed through the cost-effectiveness approach (personal communication with officials in the Directorate of Health Financing and Economics, National Department of Health, South Africa). One problem is the complexity of transforming services which currently are configured very differently, and which service populations whose utilisation rates do not conform to the optimum, especially when baseline data are incomplete. Another is the difficulty of understanding when and how the package should be changed to accommodate new developments such as, in the case of South Africa, the escalation of the HIV/AIDS epidemic and the introduction of termination of pregnancy services.

9. MOBILISING RESOURCES FOR BASIC PACKAGES

Earlier sections have referred to the fact that even basic packages appear unaffordable to poor countries. Solutions to this problem have ranged from implementing cost recovery (for example, as promoted by *Better Health in Africa*) to mobilising massive donor support (for example, as called for by the Commission for Macroeconomics and

¹⁷ The Need Norms package does not include non-personal services, however.

Health). Whereas much of the literature on cost-effective packages tends to raise the issue of financial resources and how they might be mobilised, an evaluation of these strategies is beyond the scope of this review, except to note that financing mechanisms are a key vehicle for ensuring access to the package.

Kurowski *et al.* (2004:i) emphasize, however, that human resources tend to account for around two-thirds of expenditure and that ‘adequate human resource availability is therefore central for any large-scale attempt to increase the reach of health systems.’ They add that, in addition, ‘human resource availability is likely to determine the capacity to absorb additional financial resources and thus the pace of scaling up.’ The following section looks at what has been written about human resource requirements for the implementation of packages.

Public provision

There is little detail in the international literature on the human resources required to provide a basic package of cost-effective care. The prototypical district developed by *Investing in Health* required a very generalized 0.1 physicians per 1000 population, and 2 to 4 nurses per physician (Bobadilla *et al.* 1994). On the other hand, because of its ‘good practice site’ approach the Need Norms Project was able to measure exactly the human resources required to deliver a comprehensive service. The health worker to population ratios required to staff facility-based services are summarised in **Table 13**, although ratios for mobile and outreach services were also developed. The same physician to population ratio is proposed, but around 11 nurses are proposed to every one doctor. This reflects the situation of a middle-income country as well as the more comprehensive nature of the package proposed.

Table 13: Guidelines for personnel requirements for facility-based services at the district level, as developed for a middle-income country (South Africa) by the Need Norms Project

GEOGRAPHIC LOCATION	REQUIRED FTE PER 10,000 DENOMINATOR POPUALTION		
	Professional nurse or primary health care nurse	Doctor	Enrolled nurse or nursing assistant
Urban	6.62	0.98	4.17
Rural	6.74	1.00	4.24

Source: Rispel, Price and Cabral (1996:172-173)

Recently, Kurowski *et al.* (2004) investigated the human resources required at the district level to implement the package of services recommended by the Commission for Macro-economics and Health in Tanzania and Chad, both currently and in 2015. Their model was based on need for health care, adequate service coverage, intervention-specific tasks and staff productivity and, for future human resource availability, included current human resource availability, training capacity and attrition. They found that ‘given current health needs and service coverage levels, estimates of total human resource requirements were less than existing active supply in both countries’ (Kurowski *et al.* 2004:iii). This implies that existing services should be able to provide the full package, but that human resources are being deployed elsewhere (that is, on activities outside the package). However, in both countries, ‘future human resource availability was grossly insufficient to meet the human resource requirements necessary to scale up

priority interventions to the scale recommended by the CMH' (Kurowski *et al.* 2004:iv). The largest gaps existed in staff with nursing and midwifery skills (the desired ratio between unskilled and skilled workers being 0.18 and 0.29 in Tanzania and Chad respectively). This severe shortage of human resources is likely to be the pattern in many Sub-Saharan countries, which means that there needs to be a massive programme to train appropriate cadres in order to be able to deliver the basic package in future.

Private provision

Since *Investing in Health* private sector providers have been raised in connection with achieving wide coverage of essential services. Private providers clearly play a significant role in many low- and middle-income countries with respect to the provision of primary care services (Berman and Rose 1996, Palmer *et al.* 2003), and private sector providers have thus come to be seen by governments as additional resources that can alleviate the burden on public services.

It is acknowledged, too, that patients often prefer the private sector for a number of reasons (Khe *et al.* 2002, Mills *et al.* 2002, Palmer *et al.* 2003). Such reasons include geographic accessibility and convenient opening hours, more favourable staff attitudes towards patients and perceived better quality in terms of shorter queuing times, greater privacy, and quality of diagnosis, treatment and counselling. With the introduction of user fees in public facilities, poorer sections of communities sometimes turn to self-medication and private practitioners (see, for example, Khe *et al.* 2002). Whilst private providers are often thought of in terms of curative care, there is growing interest in the role that they could play in meeting public health objectives especially with respect to rolling out primary care services (Mills *et al.* 2002:326). In some contexts, private sector provision of health care is sought because the costs of public sector care are high. One of the reasons that private providers are often able to provide cheaper services is because they are adjusted to the purchasing power of the client, such as when partial doses of drugs are sold (Mills *et al.* 2002).

While the private sector is sometimes thought of as 'homogenous and financially self-sustaining', in reality this sector is highly heterogeneous (Giusti *et al.* 1997:194). Not-for-profit private providers have often been instrumental in bringing primary care to poor communities. In Uganda, for instance, the non-governmental sector pioneered the development of primary health care initiatives which now account for about 65 percent of the current primary health care delivery in the country (Berman and Rose 1996:145).

The potential for for-profit providers to contribute to care of the poor is less obvious, however, especially with respect to its ability to meet public health objectives. Palmer *et al.* (2003:293) note, for example, that whereas there appears to be a general perception in South Africa that the quality of care is good (or better than at public facilities), there is evidence that suggests that 'general practitioners often deliver care of questionable technical quality, especially with respect to the quality of diagnosis and use of appropriate drugs'. Mills *et al.* (2002), in reflecting on the role of the private sector in low-income countries, find that consumers of private sector primary care in these countries are often unable to assess the technical quality of services, tending to place more weight on aspects of perceived quality, such as interpersonal skills of providers and the comfort of the environment in which treatment occurs, both of which may be unrelated to technical competence.

Mills *et al.* (2002:325) argue that the effectiveness of private services is by and large also rather low: 'poor treatment practices have been reported for diseases such as tuberculosis, and sexually transmitted infections, with implications not only for the individuals treated but also for disease transmission and the development of drug resistance.' For example, Chabikuli *et al.* (2002:40), in a study of urban private practitioners in South Africa, found that 'knowledge of recent developments in STD syndromic management and effectiveness of prescribed drugs was poor ... and less than half the prescriptions overall were judged as effective.'

Given such problems with quality and effectiveness, as well as the financial incentives that operate in the for-profit sector in favour of over-servicing, could the private for-profit sector play any useful role in the delivery of cost-effective packages? Palmer *et al.* (2003:292) review a 'new model of private primary care provision' that has emerged in South Africa, which sees commercial, private companies providing 'standardized primary care services at relatively low cost' (these services target the low-income employed, and not the very poor). With respect to the growing popularity of these private clinics, it appears that they do maintain excellent standards with respect to the quality of services, in terms of 'cleanliness, space and the availability of drugs and equipment... the waiting time at the private clinics was usually 10-40 minutes, compared with 50 minutes to 3 hours recorded in the public clinics' (Palmer *et al.*, 2003: 294). According to Palmer *et al.* (2003), these private clinics also run at a cost per visit that is comparable with public sector primary clinics (see **Table 14**), proving that the acceptability of services to users and low-cost service delivery are not incompatible objectives.

Table 14: Comparison of mean cost per visit between primary care providers in South Africa in 1998/99 (2001 prices)

COST CATEGORY	PUBLIC SECTOR		PRIVATE SECTOR	
	Small clinics, no full-time doctors (n=3)	Large clinics with full-time doctors (n=2)	Private clinics with full-time doctors (n=2)	Private general practices (n=2)
	\$	\$	\$	\$
Recurrent total	4.02	7.16	4.56	11.30
External administration	0.32	0.37	0.92	0.15
Internal administration	0.38	0.75	0.43	0.97
Clinic staff	1.29	3.23	1.48	3.38
Drugs and clinical supplies	1.48	2.00	1.10	4.22
Capital costs	0.53	1.84	1.20	0.94
Total cost per visit	4.54	2.14	5.77	12.24

Source: Adapted from Palmer *et al.* (2003)

Palmer *et al.* (2003) suggest that, given the increasing popularity of these (affordable) private clinics, there seems to be an opportunity to encourage employed but low income workers (who historically used public sector health services) to make use of networks of private clinics. This would then enable the public sector to better tend to its 'role as regulator and providing services to the poorest. Potentially, this could remove some of

the burden on the public sector, and the task of regulation might be made easier by the strong hierarchical control exercised within these clinic chains' (Palmer *et al.* 2003: 295). To some extent this has been the experience of Sri Lanka, where government services have been designed explicitly with the assumption that certain care is provided through the private sector (Rannan-Eliya 2001).

However, Palmer *et al.* (2003) point out that there are potential drawbacks to the model that they have studied. The comprehensiveness and continuity of the services provided by these private clinics falls far short of that available in the public sector. In addition, it is not clear how the behaviour of private clinics would change under a system of contractual arrangements with the public sector. Whereas contracting with the not-for-profit sector tends to accommodate government objectives fairly easily (Gilson *et al.* 1997), the experience of contracting with the for-profit sector has been extremely mixed (Bennet, McPake and Mills 1997).

These and other concerns imply that whereas the for-profit sector is an important resource, arrangements for the delivery of basic packages through this sector should be developed with caution, preferably within the context of strong over-arching government policies on engagement with the private health sector and strong regulatory frameworks. It is important that, where public health systems are weak, the private sector does not gain ground at the expense of the public sector, with potentially serious consequences for costs and equity.

10. CONCLUSION: HOW CAN GOVERNMENTS USE INTERNATIONAL EVIDENCE ON COST-EFFECTIVENESS TO DEVELOP PRIMARY CARE SERVICES?

Earlier sections identified some of the limitations of global estimates of the burden of disease. Clearly, some sense of the local or regional burden of disease is required for governments to understand what diseases are potential priorities requiring intervention within their own country's borders. However, burden of disease studies, at least as envisaged in the 1990s, are extremely resource-intensive, particularly in low-income countries where data on cause of mortality is often of poor quality, and the assessment of morbidity is culturally complex and prohibitively expensive. In addition, these studies quickly become out of date.

Governments clearly need to find some middle road between being dependent on global estimates for priority setting, and conducting expensive burden of disease studies of their own. This 'middle road' might entail the judicious use of international estimates (especially at the regional or sub-regional level), the improvement of national mortality data and local disease surveillance. Indeed, an alternative to large burden-of-disease studies is provided by recent burden-of-disease surveillance methods (using mortality only, as recommended by the Commission on Macroeconomics and Health): data from such demographic surveillance sites were used by TEHIP, for example. This may make it possible for countries to keep abreast of real-time trends in the population burden of disease in sentinel or sample populations (<http://www.indepth-network.org>).

Burden of disease estimates, even at the local level and even in combination with cost-effectiveness analysis, should not be – and have never been argued to be – the exclusive basis for priority-setting. Other considerations, including the value placed by society on the spectrum of services as well as the meaning given by it to the concept of equity, should also come into play. What is important is that priority-setting be conducted in a rational way and be protected from the undue influence of narrow interests.

Once governments understand which conditions are to be the focus of their attention, the next challenge is to select interventions that address these priorities whilst offering good value for money. Earlier sections showed how the results of many international cost-effectiveness studies are either methodologically suspect, or non-generalisable to local settings. Local circumstances that may affect cost-effectiveness include the coverage of services (as interventions need to be delivered properly to an adequate proportion of the target population to have a substantial impact), the technical efficiency of local services, the distance of present services from optimal coverage (the costs of scaling up become particularly expensive when attempts are made to reach remote communities), the costs faced by communities in accessing services and the packaging of different services together. In addition, some interventions developed internationally may be politically or culturally unacceptable to a local community, while health care providers may be faced with pressures to render services that are generally not considered the most cost-effective. In the latter instance, communities may simply be demanding inappropriate services out of ignorance, but they could equally be placing value on benefits that have not been captured sufficiently by the technical process of economic evaluation. How, then, would governments be able to assess what is effective in the local setting?

While conducting local cost-effectiveness studies may be possible in some limited instances, it is far more likely that governments will have to rely on the judicious use of cost-effectiveness estimates as they become available internationally. Governments would be well-served both if the methodological basis for these estimates were improved (the 'WHO-CHOICE' project is engaged in developing improved standards for cost-effectiveness analysis as well as league tables that allow comparison of results between regions (see, for example, Johns, Baltussen and Hutubessy 2003)), if there were wider debate with respect to the generalisability of findings, and if the perspective of studies was broadened to include at least the costs to communities. Developing country governments could clearly make good use of economic evaluations that evaluate *new* interventions (for example, the application of new technology to treat conditions at the primary level that would previously have required hospital care), or that evaluate *alternative* interventions for achieving the same end (for example, interventions that improve the way TB prophylaxis is applied to HIV/AIDS patients). It would also be useful if extremely cost *in*-effective practices were advertised more widely. Many developing countries still continue to invest disproportionately large amounts of funds in high-level, cost-ineffective services, or engage in outdated practices at the primary level (such as the use of antibiotics to treat viral infections).

These are clearly useful ways in which cost-effectiveness knowledge can inform decision-making by governments and local health services, as shown, for example, by the TEHIP experience. But should governments go as far as to construct primary care packages based on cost-effectiveness estimates alone? The evolution of basic package recommendations over the past decade has been remarkably consistent, tending simply

to expand at the margins to include new disease threats, rather than to radically re-shape the content of packages. It appears, in fact, that there is broad consensus on the range of activities that are appropriate at the primary level. In many ways this consensus existed before the advent of *Investing in Health*, but the cost-effectiveness 'movement' has subjected conventional wisdom to validation and considerations of affordability. This has served the purpose of providing a basis for consensus that is particularly convincing to groupings such as Treasuries and donors.

The controversy that surrounds the 'cost-effective package' approach seems to stem rather, at least in part, from the verticalisation that it implies. While the authors of basic packages have not been proponents of verticalisation (and, in some instances, have argued strongly for the cost-effectiveness that a well-integrated service achieves), the reality of activity by international agencies, donors and even governments tends towards the implementation of individual programmes. Putting in place at clinic level a number of vertical programmes that together make up the full list of cost-effective interventions could, at the very least, be inefficient but, at its worst, be extremely harmful for the integration and long-term sustainability of these services (Unger, de Paepe and Green 2003). Thus, for example, while HAART may be cost-effective, vertical approaches to its delivery could be construed as one of the biggest present threats to the district health system. Indeed, it is useful to enquire at this stage whether the general expansion of basic package recommendations in response to the HIV/AIDS epidemic does not pose a threat to the sustainability of the other components of the package, given not only financial constraints but also the severe human resource constraints experienced by the developing world. This draws attention again to the fundamental problem of how to find cost-effective, integrated delivery strategies for interventions of known cost-effectiveness, an area that has been subjected to relatively little research.

It might be more capacitating to local health systems then, if cost-effectiveness evidence were used not so much to construct packages as to influence good practice more positively. For example, it would not be argued that antenatal care should form a core part of primary level services, but the number of antenatal visits and the types of procedures and follow-up that ensue from them could be elucidated from a cost-effectiveness perspective. For these and other services, a first step might be to ensure that treatment protocols based on the presently most updated information are used routinely, that the training of nurses in particular be continuously updated as new evidence emerges, and in the long term that a culture of practice based on evidence is developed. This would require continual interrogation of current practice – and of international findings – to improve the cost-effectiveness of service delivery. The implementation of the Bamako Initiative in Benin and Guinea, which resulted in the rapid expansion of primary care coverage, represents one strategy for service development at a local level that could incorporate the consideration of cost-effectiveness knowledge quite easily (see **Box 12**). This strategy includes a variety of techniques, including lessons from best practice, to continually improve service delivery and manage change.

Box 12: Strategy for the development of district health services in Benin and Guinea, as undertaken by the Bamako Initiative

- i) Analysis of best practices to ensure effective, efficient, financially viable and equitable PHC systems, applying lessons learned from ..[earlier projects];
- ii) Translation of best practices into a coherent set of operational strategies and management systems in the form of a PHC development project, using this project as an ongoing training and experimentation site;
- iii) Adaptation of the strategies and taking these to national scale, involving an innovative bottom-up approach including community participation, peer support, networking, and regular monitoring to ensure accountability to results; and
- iv) Concurrently, the development of national support systems (review of budget procedures, management information, human resource management, systems for drug/vaccine supply etc.)

Source: Knippenberg *et al.* (1997:23)

Achieving widespread application of evidence-based medicine (EBM) at the local level is not necessarily easy, however. In a study in Chile, Bedregal and Ferlie (2001) found that changes in practice based on evidence only occurred informally. Most changes accompanying health system reform related to intermediate processes in management and 'stakeholders with management responsibilities thought that EBM does not give answers to problems within the field of organization and management ... EBM is seen by most stakeholders as a separate tool for clinicians and not related to improving the quality of the Chilean health care system.'

Encouraging the use of cost-effectiveness evidence at the local level probably needs to go hand in hand with broader strategies at a national level to encourage such considerations to become *one* of the many tools used in decision-making. **Box 13** summarises the recommendations in this regard, as proposed by *Better Health in Africa*. Critics of the cost-effectiveness approach might find these recommendations overly reliant on the technical 'exactitude' of cost-effectiveness data, and in practice services probably need to be identified using a number of criteria, as the next paragraph proposes. Nonetheless, the principle remains that once services have been identified governments need to put in place practices that encourage that these – and not other undesired or cost-ineffective - be implemented.

Box 13: Priorities for action by African governments with respect to promoting cost-effective approaches to health

- Establishing appropriate programmes of public health services, and financing them before supporting other health services;
- Determining which package of health services, if adequately used, would be most cost-effective;
- Reducing direct government engagement in provision of health care where non-government providers show potential for an increasing role, and reallocating public financial support for health care from relatively cost-ineffective curative care interventions to the basic package;
- Subsidising the package of services for the poor and, in the absence of non-government willingness to provide services on acceptable terms, directly providing these services to the poor;
- Subsidising those components of the package that result in the largest number of direct and indirect benefits for the largest number of people (e.g. immunizations);
- Providing information to the public that will stimulate demand for the basic package, empower citizens to choose wisely among providers, and assist households to make sound use of the package.

Source: World Bank (1994:9)

The cost-effectiveness approach needs to be tempered with a consideration of other factors, however. Proponents of cost-effective packages frequently point to the trade-off that needs to be made, justifiably they admit, between cost-effectiveness and equity. The case of extending services into remote areas – where the cost of delivery becomes relatively more expensive – is often quoted in this regard. However, the concept of equity is the cornerstone of many modern health systems, and at the primary level the ‘trade-off’ could mean denying services to certain categories of patient because of less favourable cost-effectiveness. In the case of severe illness, this could have a devastating effect on patients and the sustainability of their households, as discussed earlier. Explicit attention – and certainly far more than is apparent in the literature – needs to be paid to the implications for equity of applying the cost-effectiveness approach. There is no escaping the fact that in each country political, rather than technical, decisions need to be made, preferably involving extensive debate within civil society, in order to judge the level of equity (or level of inequity) that is tolerable. These decisions of course have to confront the problem of affordability: at present even the most limited basic packages appear unaffordable to low-income countries, at least without substantial re-prioritisation of domestic resources or a substantial inflow of donor funds.

Determining intervention priorities may be a complicated technical and political exercise, but to implementers the real challenge is to ensure that services – of whatever sort or form – are provided on the ground, at least cost and as effectively as possible. Planners and health workers face enormous constraints in implementing interventions, even of known cost-effectiveness (see **Table 15**). Amongst these constraints are the features of donor funding arrangements that limit the injection of funds into core government activities (as opposed to special projects). For implementers priorities might lie in the evaluation of methods to ‘relax constraints,’ in the terminology of Jha and Mills (2002), in order to achieve the delivery and scaling up of district health care services.

Table 15: Categorisation of constraints on the expansion of services

Levels	Constraints
Community and household level	<ul style="list-style-type: none"> ▪ Lack of demand for effective interventions ▪ Barriers to use of effective interventions: physical, financial, social
Health services delivery level	<ul style="list-style-type: none"> ▪ Shortage and distribution of appropriately qualified staff ▪ Weak technical guidance, programme management and supervision ▪ Inadequate supplies of drugs and medical supplies ▪ Lack of equipment and infrastructure (including labs and communications) and poor accessibility of health services
Health sector policy and strategic management level	<ul style="list-style-type: none"> ▪ Weak, overly centralized systems for planning and management ▪ Weak drug policies and supply systems ▪ Inadequate regulation of pharmaceutical and private sector and improper industry practices ▪ Lack of inter-sectoral action and partnership for health between government and civil society ▪ Weak incentives to use inputs efficiently and respond to user needs and preferences ▪ Reliance on donor funding that reduces flexibility and ownership ▪ Donor practices that damage country policies
Public policies cutting across sectors	<ul style="list-style-type: none"> ▪ Government bureaucracy ▪ Poor availability of communication and transport infrastructure
Environmental characteristics	<ul style="list-style-type: none"> ▪ Governance and overall policy framework <ul style="list-style-type: none"> ○ Corruption, weak government, weak rule of law and enforceability of contracts ○ Political instability and insecurity ○ Low priority attached to social sectors ○ Weak structure for public accountability ○ Lack of free press ▪ Physical environment <ul style="list-style-type: none"> ○ Climatic and geographic predisposition to disease ○ Physical environment unfavourable to service delivery

Source: Hanson *et al.* (2001) quoted in Jha and Mills (2002:59)

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APPENDIX 1: FIGURES USED TO CONVERT PRICES QUOTED IN REVIEWED ARTICLES TO 2001 PRICES (\$US)

Note: A figure quoted in 1990 prices would be multiplied by 1.27 (from the last column) to achieve a figure in 2001 prices.

Year	GDP index (1995=100)	Inflator/deflator (2001=1)
1960	21.76	5.13
1961	21.97	5.09
1962	22.48	4.97
1963	22.81	4.90
1964	23.22	4.81
1965	23.86	4.68
1966	24.70	4.52
1967	25.41	4.40
1968	26.64	4.19
1969	28.02	3.99
1970	29.44	3.80
1971	31.09	3.59
1972	32.38	3.45
1973	34.19	3.27
1974	37.27	3.00
1975	40.76	2.74
1976	43.06	2.60
1977	45.83	2.44
1978	49.08	2.28
1979	53.19	2.10
1980	58.08	1.92
1981	63.50	1.76
1982	67.43	1.66
1983	70.10	1.59
1984	72.71	1.54
1985	75.04	1.49
1986	76.71	1.46
1987	79.05	1.41
1988	81.75	1.37
1989	84.88	1.32
1990	88.20	1.27
1991	91.41	1.22
1992	93.64	1.19
1993	95.88	1.17
1994	97.87	1.14
1995	100.00	1.12
1996	101.95	1.10
1997	103.95	1.07
1998	105.26	1.06
1999	106.84	1.05
2000	109.20	1.02
2001	111.73 (estimate)	1.00
2002	114.32 (estimate)	0.98

APPENDIX 2: ORIGINAL PRICES AND OTHER INFORMATION QUOTED IN REVIEWED ARTICLES

Table 1: Cost-effectiveness of the health interventions (and clusters of interventions) included in the minimum package of health services as recommended by the World Bank Development Report (1993) for low- and middle-income countries (1990 prices)

INTERVENTIONS	COST PER DALY (\$)	
	Low-income countries	Middle-income countries
Public health		
Expanded programme of immunization plus (i.e. including vaccine against Hepatitis B and Vitamin A supplementation)	12-17	25-30
School health programme	20-25	38-43
Tobacco and alcohol control programme	35-55	45-55
AIDS prevention programme ⁽ⁱ⁾	3-5	13-18
Other public health interventions (includes information, communication and education on selected risk factors and health behaviours, plus vector control and disease surveillance)		-
<i>Total</i>	<i>14</i>	<i>-</i>
Clinical services		
Chemotherapy against tuberculosis	3-5	5-7
Integrated management of the sick child ⁽ⁱⁱ⁾	30-50	50-100
Family planning	20-30	100-150
STD treatment	1-3	10-15
Prenatal and delivery care	30-50	60-110
Limited care (includes treatment of infection and minor trauma; for more complicated conditions, includes diagnosis, advice and pain relief, and treatment as resources permit)	200-300	400-600
<i>Total</i>		<i>133</i>

Notes:

- (i) understates cost-effectiveness because looks at probability of transmission to others only in the first year
- (ii) protein-energy malnutrition and Vitamin A deficiency can produce death and disability directly or through other diseases, but only the direct loss was counted in this exercise

Source: Bobadilla *et al.* (1994:657)

Table 2: The costs of six primary health care projects reviewed by Gwatkin *et al.* (1989)

LOCATION	PRICE BASE (yr)	ANNUAL PER CAPITA COST (\$, nominal)	% OF ANNUAL PER CAPITA GNP
Imesi, Nigeria	1966	1.50	2.0
Etimesgut, Turkey	1968-74	6.50-7.50	1.5-2.0
Narnangwal, India	1970-73	0.80-2.00	0.8-2.0
Rural Guatemala II	1969-77	3.50	0.75-1.0
Jamkhed, India	1978	1.25-1.50	1.00-1.25
Kavar, Iran	1975	3.50-5.35	0.4-0.5

Source: Drummond and Mills (1987:77)

Table 3: The per capita costs of delivering the World Bank minimum package (1990 prices)

INTERVENTIONS	ANNUAL COST PER CAPITA (\$)	
	Low-income countries	Middle-income countries
Public health		
Expanded programme of immunization plus (i.e. including vaccine against Hepatitis B and Vitamin A supplementation)	0.5	0.8
School health programme	0.3	0.6
Tobacco and alcohol control programme	0.3	0.3
AIDS prevention programme ⁽ⁱ⁾	1.7	2.0
Other public health interventions (includes information, communication and education on selected risk factors and health behaviours, plus vector control and disease surveillance)	1.4	3.1
<i>Total</i>	<i>4.2</i>	<i>6.9</i>
Clinical services		
Chemotherapy against tuberculosis	0.6	0.2
Integrated management of the sick child ⁽ⁱⁱ⁾	1.6	1.1
Family planning	0.9	2.2
STD treatment	0.2	0.3
Prenatal and delivery care	3.8	8.8
Limited care (includes treatment of infection and minor trauma; for more complicated condition, includes diagnosis, advice and pain relief, and treatment as resources permit)	0.7	2.1
<i>Total</i>	<i>7.8</i>	<i>14.7</i>
Grand Total	12.0	21.5

Source: Bobadilla *et al.* (1994:657)

Table 4: Annual indicative per capita costs for a district-based health care system: output approach (1990 prices)

TYPE OF SERVICE	COST IN LOW-INCOME AFRICA
INDIVIDUAL HEALTH CARE SERVICES	
Level 1: Health centre	
Maternal services	0.47
Pre-delivery care	
Delivery care, incl. management of high-risk pregnancies	
Post-delivery care	
Nutrition: pregnant and lactating women	
Well-baby services	1.52
EPI	
Oral rehydration therapy	
Micronutrient supplements	
Nutrition: ages 0-5	
Supplementary feeding: ages 0-2	
School children health programme	0.21
Anthelmintic services (ages 5-14)	
Vitamin A plus iodine, as needed	
Curative care (esp. children ages 0-5)	0.46
Basic trauma	
Malaria	
Diarrhoea	
Opportunistic infections (AIDS related)	
Other local infections	
Limited chronic care	0.11
Tuberculosis treatment	
STD services (testing and treatment)	0.13
Family planning	0.87
Provision of contraceptives	
Incremental family planning	
Information, education and communication (for nutrition, family planning, HIV/STD)	0.8
<i>Subtotal, Level 1</i>	4.6
Level 2: District hospital	
Inpatient care	2.2
Obstetrics and gynaecology	
Paediatrics	
Medicine: infectious diseases	
Basic surgery	
Outpatient care	0.94
Emergencies	
Referrals	
<i>Subtotal, Level 2</i>	3.14
<i>Subtotal, individual health care services</i>	7.74
INTERSECTORAL INTERVENTIONS	
Water	2.56
Sanitation	1.42
<i>Sub-total, Intersectoral interventions</i>	3.98
INSTITUTIONAL SUPPORT	
National management support	0.82
Surveillance, monitoring and evaluation	
National capacity building	
Initial training	0.27
District health team	0.29
District-level salary bonus (15 percent of total salaries)	0.12
<i>Subtotal, Institutional support</i>	1.5
GRAND TOTAL COST OF BASIC PACKAGE	13.22

Source: World Bank (1994:133-134)

Table 5: Interventions with a large potential impact on health outcomes, as identified by the World Health Report, 2000

Examples of interventions	Main contents of interventions
Treatment of tuberculosis	DOTS: administration of standardised short-course chemotherapy to all confirmed sputum smear positive cases of TB under supervision in the initial (2-3 months) phase
Maternal health and safe motherhood interventions	Family planning, prenatal and delivery care, clean and safe delivery by trained birth attendant, postpartum care, and essential obstetric care for high risk pregnancies and complications
Family planning	Information and education; availability and correct use of contraceptives
School health interventions	Health education and nutrition interventions, including anthelmintic treatment, micronutrient supplementation and school meals
Integrated management of childhood illnesses	Case management of acute respiratory infections, diarrhoea, malaria, measles and malnutrition; immunisation, feeding/breastfeeding counselling, micronutrient and iron supplementation, anthelmintic treatment
HIV/AIDS prevention	Targeted information for sex workers, mass education awareness, counselling, screening, mass treatment for sexually transmitted diseases, safe blood supply
Treatment of sexually transmitted diseases	Case management using syndrome diagnosis and standard treatment algorithm
Immunisation (EPI Plus)	BCG at birth; OPV at birth, 6, 10, 14 weeks; DPT at 6,10,14 weeks; HepB at birth, 6 and 9 months (optional); measles at 9 months; TT for women of child-bearing age
Malaria	Case management (early assessment and prompt treatment) and selected preventive measures (e.g. impregnated bed nets)
Tobacco control	Tobacco tax, information, nicotine replacement, legal action
Noncommunicable diseases and injuries	Selected early screening and prevention

Source: World Health Organisation (2000:53)

Table 6: Selected sets of interventions used in the cost analysis of the Commission for Macroeconomics and Health

Disease area	Nature of interventions
Maternity-related interventions	Antenatal care Treatment of complications during pregnancy Skilled birth attendance Emergency obstetric care Postpartum care (including family planning)
Childhood disease-related interventions (immunisation)	Vaccinations (BCG, OPV, DPT, measles, hepatitis B, HiB)
Childhood disease-related interventions (treatment of childhood illnesses)	Treatment of various conditions (acute respiratory infections, diarrhoea, causes of fever, malnutrition, anaemia)
Malaria prevention	Insecticide-treated nets Residual indoor spraying
Malaria treatment	Treatment for malaria
Tuberculosis treatment	Directly observed short course treatment for smear positive patients Directly observed short course treatment for smear negative patients
HIV/AIDS prevention	Youth focused interventions Interventions working with sex workers and clients Condom social marketing and distribution Workplace interventions Strengthening of blood transfusion systems Voluntary counselling and testing Prevention of mother-to-child transmission Mass media campaigns Treatment for sexually transmitted diseases
HIV/AIDS care	Palliative care Clinical management of opportunistic illnesses Prevention of opportunistic illnesses Home-based care
HIV/AIDS HAART	Provision of HAART

Note : Smoking cessation interventions were not included in this cost analysis as it was assumed that they would be financed by tobacco taxes

Source: Jha and Mills (2002:22)

Table 7: Baseline expenditure in 83 poor countries in 2002, and total projected expenditure to achieve 2015 targets (2002 prices)

COUNTRY GROUPING	2002 BASELINE EXPENDITURE	TOTAL EXPENDITURE TO 2015
Least developed	13	41
Other low-income	24	37
Lower middle-income	28	40
Upper middle-income	266	339
All countries	26	42

Source: Commission for Macroeconomics and Health (2001)

Table 8: Health centre operating costs per capita and per year within the Bamako Initiative in some African countries, 1989-1999 (1993 prices)

COUNTRY	TOTAL COST PER CAPITA (\$)
Benin	1.00
Guinea	0.70
Guinea-Bissau	0.60
Mali	1.30
Senegal	2.50
Zaire	1.11
Cameroon	0.28

Source: Soucat *et al.* (1997)