

Chapter 65

The District Hospital



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Health care comprises a continuum from home-based, self-administered treatment to highly specialized intervention dependent on professionals with many years of training and a heavy capital investment. In principle, the role of the health system planner is to balance the many separate components of the system to optimize the magnitude and distribution of health benefits, subject to a variety of constraints such as budgetary levels, geography, and human resources capacity. While recognizing that other paradigms are possible and valid, we generally adopt this optimization perspective in our discussions because it combines broad social (including user) and political dimensions with systematic economic principles when decisions are made in a competitive, resource-constrained environment. Following such logic, it should be possible to define the place, purpose, and size of the district hospital sector within a balanced system of care for any particular setting.

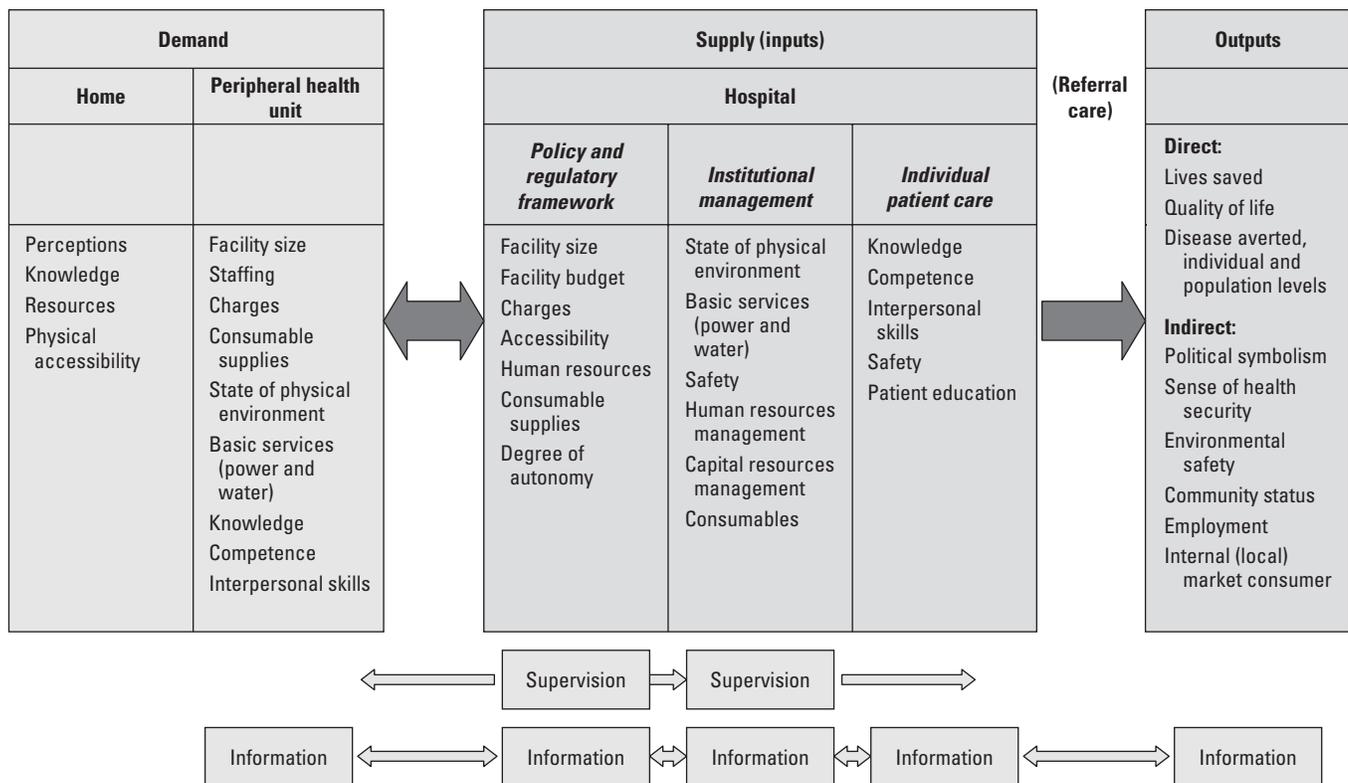
Although this view is theoretically appealing, the world of real health systems that have evolved under different historical and political pressures is somewhat different. This perspective does, nevertheless, suggest some common principles involved in defining the optimum balance of care even within groupings as diverse as “developing countries.” Two further points are worth considering:

- First, although the focus of this chapter is the district hospital, crucial links exist with many other aspects of the health system. Choices made in relation to hospitals are likely to affect the whole health system and vice versa. For example, programs to improve peripheral clinic referrals of women with high-risk pregnancies may result in a paradoxical decline in the quality of care if critical human and other resources are inadequate at the hospital level. Thus, the

picture of public district hospitals as underused, inefficient, and providing poor quality care (Barnum and Kutzin 1993) may reflect deficiencies in the entire health system as well as at the hospital level.

- Second, optimizing the health system configuration is an active, continuing process that must often proceed incrementally, ideally tackling problems in order of priority. An optimal balance is not likely to be achieved naturally through neglect or reliance on market mechanisms.

Hospitals are major consumers of health budgets. However, there is a paucity of good evidence—even in industrial countries—on their effect (McKee and Healy 2002), whereas the body of theory and opinion on their role is wide. This chapter can serve as only an introduction to topics that include, among others, the political and social value of hospitals and their essential role in integrated health systems (Sachs 2001; Van Leberghe, de Bethune, and de Brouwere 1997; WHO 1999; World Bank 1993). The chapter first introduces basic concepts relevant to district hospitals that may affect their role and performance and a description of possible core services (see figure 65.1). For discussions of the evidence justifying inclusion of an intervention or process as a core service at this level of care, the reader is referred to disease- and service-specific chapters. Although recently attempts have been made to refine definitions of *performance* (WHO 2000b), the term is used in a general sense, referring to processes and outcomes that contribute to improved levels and distribution of health. The chapter then summarizes currently available economic data on hospital care, focusing where possible on the district level and acknowledging the difficulty in generalizing findings from one setting to another. An illustration follows of some of



Source: Authors.

Note: Some of the factors that may influence a hospital's performance and its products or outputs, the value of which depends on one's perspective, are illustrated. The intrinsic roles of supervision and information flow are emphasized.

Figure 65.1 Conceptual Framework for Delivery of Health Services at the District Hospital

the factors that threaten district hospitals' performance, indicating the broad range of influences to which they are subject. Finally, possible strategies for improving performance are proposed, focusing on cross-cutting interventions, and highlight areas where current knowledge is inadequate and research is urgently needed.

DEFINITIONS, BASIC CONCEPTS, AND FRAMEWORK

The evolution of a hierarchical system of health care is readily explained if one assumes the perspective of the provider, although less obvious if one's perspective is that of the community using the hospital or a government seeking to create political capital. Concentrating skills and resources in one place for conditions that are often relatively uncommon or that cannot easily be treated closer to the home environment is intuitively attractive. Such concentration also offers the prospect of continued accumulation of experience and, thus, skill and potentially benefits from system resources that may serve a variety of needs.

What Is a District Hospital?

Health systems are often organized in a "hub-and-spoke" arrangement, with a large district hospital (the hub) having more and better-trained personnel and better equipment than more peripheral clinics (the spokes). Although variations frequently occur in practice (for example, a large district may have several relatively similar hospitals), this simple model of service provision is assumed throughout this chapter, with the district hospital supplying first referral-level care for both outpatients and inpatients. District hospitals also, in theory, may serve a gatekeeping role for those patients with less common problems, for whom skills and resources are most effectively concentrated at even higher levels of care provided at a regional or national level. Thus, from the perspective of provider efficiency, economies of scale and economies of scope are important basic concepts in considering district and referral hospital functions.

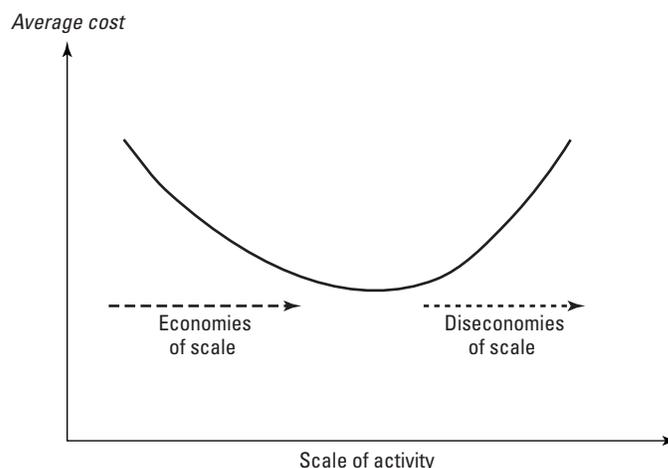
Such hierarchical health systems frequently overlap with wider political and administrative hierarchies that are based on geographically defined units. The district is, therefore, used in this chapter as a generic term for an administrative unit often comprising a population of 100,000 to 1 million people for whom one tier of local government is typically responsible. The

shared administrative boundaries and frequent proximity of district hospitals to district political administrations often result in the district hospital's involvement in the much wider tasks of district health management and public health. The performance of these functions may be critical to the success of the health system as a whole, but this role is easily forgotten.

Efficiency. Allocative efficiency deals with the desire to allocate resources to secure the maximum health benefit from the inputs available (Hensher 2001). Within this paradigm planners search for the balance between community care, primary care, and facility-based care that results in the greatest health benefit at the least cost. At the level of an individual hospital, the issue of allocative efficiency arises when decisions must be made to allocate resources to different services. In theory, cost-effectiveness studies with a global health status outcome measure such as the disability-adjusted life year (DALY) should inform debate on allocative efficiency, because such studies provide a direct means of comparing alternative strategies.

Technical efficiency deals with the extent to which specific institutions are getting the most out of the resources available. For example, is a district hospital deploying its given resources in the most effective manner to achieve the desired output? Technical efficiency is often measured using partial indicators such as cost per procedure. Interpreting such data often requires great care, but most fundamentally it requires some comparator, because a way of knowing the resources needed to produce the desired output rarely exists. Thus, *technical efficiency* is usually a relative term, and performance indicators—carefully interpreted—can be used to identify best current practice. New technology or a change in the availability or price of resources may result in continual improvements in what is achievable, so a process that was technically efficient can become relatively inefficient over time. Data on technical efficiency often provide the basis for benchmarking hospital service providers and may identify poorly performing services for targeted improvement strategies.

Economies of Scale and Scope and Hospital Size. A central policy question is whether it is more efficient to concentrate resources in a small number of large centers, where the planned number of procedures can be high, or to have a greater number of smaller centers. The issue of economies of scale determines the most efficient size hospital. Where the average costs of care can be shown to depend on hospital (or unit) size, economies of scale exist (see figure 65.2). Recent evidence suggests that, at least for industrial countries, large centers may eventually suffer from diseconomies of scale, when the inefficiencies introduced in administering a very large facility begin to outweigh any advantages (Posnett 2002). The potential for diseconomies of scale in developing countries, where the mixture of cases, the costs of inputs (particularly the relative costs



Source: Adapted from Posnett (2002).

Figure 65.2 Theoretical Long-Term Average Cost Curve

of staff salaries and technology), and the pattern of diseases vary widely, has not been examined.

In discussing economies of scale, we must consider two further issues. First, considerable evidence suggests that the ability to specialize and the experience gained with high volumes of patients can lead to better outcomes for physicians practicing in larger hospitals. Second, although reducing the number (and increasing the size) of hospitals may reduce health system costs and improve outcomes, it may shift some costs to patients in the form of increased travel time or even a reduction in the ability to reach the hospital and secure care. Thus, excessive concentration of hospital services may compromise health and equity objectives, particularly in rural areas. The planner may need to balance direct health system costs against the broader population costs of securing access. In many circumstances, this effort may give rise to an intermediate solution, such as medium-sized hospitals, smaller local hospitals equipped to deal with common procedures, or dispersed clinics staffed by peripatetic specialist teams.

The hospital also offers the potential for improving efficiency if different services use some of the same inputs. Although the hospital might not be able to justify paying the salary of a laboratory technician to perform hemoglobin measures and blood cross-matching only for the maternity unit, the fact that such a person also contributes to the work of the surgical, medical, and pediatric services makes that technician's presence more cost-effective. This laboratory service, therefore, offers an economy of scope. The concentration of inputs, both human and technological, evident at the district hospital offers major opportunities for unit-cost reductions and, therefore, economies of scope. Considering the mix of services provided as hospitals are planned or augmented is important to anticipate or account for economies of scope.

Equity. Equity is a fundamental principle guiding most public health systems. It can embrace concepts such as equality of provision or equality of access (for equal need), equality of benefit from health services, or equality of outcome. Although often not defined explicitly, many pro-poor policies, such as the Poverty Reduction Strategy Papers that encompass health, are based on some principle of equity. Loosely speaking, such policies aim to reduce disparities in access or overall health status observed between different sections of a population, most obviously the differences between rich and poor sections of a community.

For health planners, however, equity principles pose some hard challenges. For example, if an urban district has a public hospital with adequate staff and resources providing a range of acute services reasonably efficiently, should not every district hospital provide the same range of services? In practice, ensuring that a hospital in a poor, inaccessible rural district with a highly dispersed, smaller population provides a similar level and breadth of service may be difficult and considerably more expensive. The result can be a hospital with apparently high unit costs of treatment that, because of late presentation or resource constraints, secures poorer outcomes. The central policy question is: To what extent is society prepared to see resources deployed to address such equity concerns at the expense of pure efficiency?

Issues of efficiency, economies of scale and scope, and equity have contributed in part to the development of strategies defining an essential package of services that should be provided for an entire population (Bobadilla and others 1994). These packages are often targeted at the most important causes of mortality and morbidity, so the inefficiencies in providing an equitable service may be reduced. Nevertheless, the unit costs of reaching disadvantaged populations are often likely to be higher than average unit costs, and planners need to recognize this fact when designing packages and set budgets accordingly.

What Essential Services Should a District Hospital Provide?

The World Health Organization (WHO 1992) envisages that a district hospital should be able to offer diagnostic, treatment, care, counseling, and rehabilitation services provided by predominantly generalist practitioners spanning the following disciplines:

- family medicine and primary health care
- medicine
- obstetrics
- mental health
- eye care
- rehabilitation
- surgery (including trauma and orthopedics)
- pediatrics
- geriatrics.

Such hospitals will usually provide 24-hour care and be integrated into the district health system at a wider level to provide or support a range of services:

- districtwide health information
- implementation of peripheral primary health care policies
- administrative and logistics support to primary health care efforts
- communication with the community
- curative and chronic care for patients referred from peripheral units
- district laboratory services
- training and continuing medical education of health workers and students
- links between health and other development agendas
- development of local solutions to local health problems.

This menu of recommended services at the district hospital level does not represent a rigorous attempt to optimize the health system configuration to maximize its cost-effectiveness. Indeed, the logic of the earlier discussion is that the precise mix of services provided should be informed by overall health system design. Rather, the list represents what is perceived to be a fair minimum level of health provision for all, based on accumulated knowledge and experience of the common demands for hospital care (the visible burden), the availability and simplicity of interventions, the perceived effectiveness of interventions, and their acceptability in an environment constrained by limited information and limited availability of human and financial resources (Van Leberghe, de Bethune, and de Brouwere 1997).

An obvious logic supports the inclusion of many of these core functions, sometimes supported by evidence of their value. WHO's Commission on Macroeconomics and Health has attempted to define the services that small hospitals should offer as part of the close-to-client package on the basis of burden and likely cost-effectiveness (Sachs 2001). However, although useful for suggesting service priorities, the report considers primarily infectious diseases and maternal health. In addition, it is not clear whether recommended services were included on the basis of data on condition-specific burden and intervention cost-effectiveness or of the potential effect of the combined package of services considering potential economies of scale and scope. Future studies should perhaps address more clearly the issues of the incremental cost-effectiveness of new or additional interventions at the district hospital level when exploring the appropriateness of services.

Clinical Services

The initial drive to implement primary health care (PHC) left district hospitals sidelined. They were often grouped with

expensive tertiary units; were labeled high cost, inequitable, and relatively ineffective; and were rarely protected by powerful professional groups based in the tertiary centers. Their position as an integral part of PHC was reestablished during the 1980s (Canadian International Development Agency and the Aga Khan Foundation 1981; WHO 1987). Currently the district hospital is envisaged as the apex of the pyramid of primary health care, most obviously in such programs as Safe Motherhood and Integrated Management of Childhood Illness. In programs such as Integrated Management of Childhood Illness, the expected role of district hospital-level care is explicit (WHO 2000a), with priority conditions reflecting burden-of-disease estimates (Black, Morris, and Bryce 2003). Although the effectiveness of this approach has yet to be established, evidence at the hospital level suggests that delivering a basic package of care may, in principle, cover the majority of admitted cases and improve service delivery (Ngoc Anh and Tram 1995). However, without tackling current difficulties at the hospital level, effectiveness cannot be assumed (see “Information and Integration” later in this chapter).

Other basic approaches to delivery of services at the district hospital level, such as triage of new outpatient attendees and a basic package of neonatal care, also show promise (Duke, Willie, and Mgone 2000; Robertson and Molyneux 2001). Interventions such as the provision of basic trauma care can effectively be offered only at this level of the health system (see chapter 68), while in other areas (for example, chapters 26, 31, and 67) hospital inpatient care should be considered together with alternative means of delivering services if cost-effectiveness is to be maximized. These examples all serve to emphasize that close-to-client health services must be tightly integrated with district hospital-level care and demonstrate strong dependency on the referral system. Thus, cases too complex or serious to be managed in the periphery are sent for care where skills and resources are more highly concentrated, in the expectation that health outcomes will be better. This attractively simple idea presupposes that the district hospital is able to provide the care desired; although some evidence supports the likely effectiveness of this approach (Van Leberghe and Pangu 1988), clearly numerous potential obstacles exist along this pathway (discussed in the later section “Factors Influencing District Hospitals’ Performance”).

Additionally, although the focus has often been on district hospitals as recipients of referrals, a much more dynamic relationship has been proposed (WHO 1987): for many PHC activities such as immunization programs the district hospital is both a provider of services and a coordinating center for information and supplies. To permit early discharge, enhance treatment compliance, and make home-based care possible—all of which may improve cost-effectiveness—hospitals need to play an active role in providing outreach services, supervision, and support.

Cross-Cutting Services at the District Hospital

Some medical services provide support to a range of departments or users and are referred to as cross-cutting services. Such services include those aimed at recuperation and rehabilitation (physiotherapy, occupational therapy, and so forth; see chapter XX; laboratory services, and diagnostic imaging. Whether and to what degree these services are provided may be major determinants of the overall range of services that can be offered, the fixed costs of providing care at district hospitals, and their cost-effectiveness. Their provision should, therefore, be planned as part of the portfolio of care to be offered, taking into account expected use and estimates of the value added. This strategy suggests a degree of flexibility that may conflict with historical perspectives about what is important and “one size fits all” national policies. Health information systems are also a critical cross-cutting service; they are discussed in the “Health Information Systems” section of this chapter.

It is worth noting here that the concentration in hospitals of cross-cutting resources used by different activities often gives rise to many accounting complications, such as allocating overhead costs, which bedevil attempts to secure meaningful cost comparisons across hospitals.

Wider Role in the District Health System

District hospitals often house the technical expertise and professional authority essential for local implementation of national policy, making them potentially key players in managing, monitoring, and supervising district health plans. They should also act as advocates for plans that address local health needs. This section examines this wider role of the district hospital, the value of which is often hard to quantify, but which may be critical to the effectiveness of the local health system as a whole.

Integration with Other Local Health-Related Services. A district hospital should, in most cases, be an integral part of a wider district health system. Although not specifically discussed here, part of the broader remit is often to link up with other governmental and nongovernmental actors in health and health-related programs, which may include water and sanitation, education, and social services. (A more specific discussion can be found in WHO 1990.) Those important coordination functions are hard to value in traditional examinations of cost and cost-effectiveness but may be critical in sustaining a coordinated health care approach, especially if greater autonomy is devolved to district administrations.

Training. District hospitals often have a direct role in the primary training of health workers, particularly clinical assistants, nurses, and health aides, as well as an ongoing role in providing continuing medical education. Their role in building human resources capacity among those actively participating in health

care delivery and in ensuring that training and experience reflect the real health needs of the community is potentially of great value. Additionally, as the focal point of outreach for many programs that aim to disseminate knowledge through the cascade mechanism, district hospitals are often relied on to transmit knowledge to more peripheral levels of care.

Supervision. Together with their training function, district hospital staff members are often supposed to provide supervision and support to health workers at more peripheral levels of care and to act as part of the regulatory mechanism, sometimes in both the public and the private sectors. Although this function is likely to be an important means of developing and refining the referral system through two-way exchange of information and of seeing that policy decisions are implemented, the ability of the health staff to fulfill this function is often extremely limited. Because resources are scarce, activities with the least tangible benefit—such as supervision and monitoring—are frequently abandoned, breaking important chains of communication.

Health Information Systems. Many national health information systems rely on district hospitals to coordinate data collection in the district. In theory, for a number of diseases the district hospital may be the only source of information, for example, for severe diseases such as neonatal tetanus, acute flaccid paralysis, or operative deliveries. The district hospital is, thus, a core data source supposedly providing burden-of-disease data at greater resolution than is commonly available and at a meaningful administrative level if action is required. However, in many developing countries health information systems are inadequate and inaccurate; staff members are not equipped with the skills necessary to interpret data (Loevinsohn 1993) and are often unaware of their local value, thus depriving the local staff of essential planning and monitoring tools. Introducing an information culture and the necessary skills and infrastructure to support such a transition, although of potentially enormous value, presents significant challenges even for middle-income countries.

Formulating a Package of Services to Maximize Cost-Effectiveness

Interventions identified as being cost-effective in particular service areas or necessary to preserve the integrity of an effective and equitable health system should be a part of a basic package of services and responsibilities at the district hospital level. However, the way in which these individual components are combined and integrated is also critical. Factors, including economies of scale and scope, whether gains or losses in efficiency result from integration, and the influence of use and resource availability, will all have a profound influence on whether the district hospital itself is as cost-effective as the sum of its parts suggests it should be.

ECONOMICS OF DISTRICT HOSPITALS: A SUMMARY OF REPORTED EXPERIENCE

The previous sections outline the suggested functions and extended role of a district hospital. Although some countries have adopted the principle of essential packages of services and defined detailed norms and standards for care at this level as part of long-term health sector strategies, many countries lack any specific hospital strategy (WHO 1994). Even where a well-articulated strategy exists, decades of different political, social, economic, and historical influences on health system development result in great variability of district hospitals, both between and within developing countries. Thus, some district hospitals of 500 beds have a full complement of specialist consultants and access to a wide range of diagnostic and therapeutic services, while other hospitals of as few as 30 beds, but more often 80 to 150 beds, are run almost entirely by medical assistants and nurses, sometimes lack reliable power or water supplies, and often offer few or no high-quality modern diagnostic services. This variability makes it daunting to extrapolate findings from one setting to another and may seriously undermine the value of attempts to provide useful general descriptions of hospitals. In particular, when interpreting calculated costs of care at a national or individual level, we must remember several critical points:

- Relevant data may often be missing or inadequately defined at a country level.
- Because a number of accepted ways of calculating costs exist, particularly at the level of individual interventions, different methods are likely to lead to different estimates. The particular design used to estimate costs should be considered when interpreting any results.
- In particular, a central feature of the hospital is that many of its resources are used for more than one activity, so unit cost estimates depend crucially on how the costs of these resources are allocated among activities.
- The relative prices of inputs can vary substantially between regions and countries.
- In the majority of cases, only the cost of care is reported without reference to outcomes so that the cost per unit of health benefit (however defined) is unknown.
- Calculated costs usually reflect the care offered; it may not be the same as the care that is necessary, of an acceptable quality, or most effective.
- Cost estimates cannot indicate the extent of unmet need or other sources of inequity.
- The costs of care will depend to some extent on the severity of illness of the patients and, for average costs per bed day, on the variety and relative proportions of different illnesses (the *case mix*). These areas are rarely commented on or adjusted for.

Levels of Provision of Hospital Care

Data on the levels of service provision for many developing countries are crude. In the absence of any more meaningful data, the number of beds is most often used as a (poor) substitute. Bearing this weakness in mind, sources estimate the average number of total hospital beds to be 1.3 per 1,000 population in developing countries (World Bank 2002), a figure probably declining in many developing countries (Hensher and others 1999), with varying estimates of the average number of doctors from 0.5 per 1,000 population in low-income countries generally (World Bank 2002) to 0.09 doctors per 1,000 population in Sub-Saharan Africa (Peters and others 2000). These estimates are considerably lower than the averages for beds and doctors of 7.2 per 1,000 and 2.9 per 1,000, respectively, in high-income countries (World Bank 2002). Although these estimates provide some indication of the major disparities in service provision between rich and poor countries, their value is limited. Lack of information on the relative distribution of beds and staff by geographic zone, or between district and higher referral levels of care in a single country, and the fact that bed and staff numbers are probably a poor reflection of activity make these figures a poor substitute for data on patient throughput and outcomes, statistics rarely available for district hospitals. Furthermore, with the concentration on provision of service, the demand for services may often be ignored. It is still true in many countries that most deaths, presumably many preventable, occur at home and that many chronic diseases are inadequately treated. The need for hospital care is largely undetermined, but some have argued that the lack of provision of district hospital care, in Sub-Saharan Africa at least, is a significant impediment to improving overall health status (Van Leberghe, de Bethune, and de Brouwere 1997).

What Do District Hospitals Cost at a National Level?

Although it has been argued for some time that hospitals consume too much of health sector budgets, thereby depriving primary care of adequate resources, it is surprisingly difficult to identify how much hospitals cost in low- and middle-income countries. Even where data exist on health expenditure, such data are often at a highly aggregated national level and the functions that are included (clean water and sanitation, for example) are not always clear (World Bank 2002). Furthermore, whether private or nongovernmental expenditure, capital expenditure, or the value of noncash inputs—such as donations of equipment or volunteers' time—are included is rarely apparent. Add to this ambiguity the nearly impossible problem of separating what is spent at different levels of the health or hospital system—for example, to distinguish between district and referral hospitals—and it should be clear that we currently have only a crude understanding of the costs of district hospitals as a unit of service provision (Mills 1990a).

If just government health expenditure is considered, the available data suggest that hospitals at every level taken together consume 50 to 60 percent of recurrent national health budgets, with the proportion appearing to increase as countries become richer (Barnum and Kutzin 1993). If private expenditure on health care (insurance and out of pocket) is included, the proportion of total health expenditure consumed by all hospitals falls to 30 to 50 percent of the total in developing countries (excluding South America) (Mills 1990a). Whereas these figures reflect total hospital sector expenditure, the limited data available suggest that district hospitals may receive less than 50 percent of this total in many countries, consuming fewer resources than secondary and tertiary referral facilities (Mills 1990a).

The Nongovernmental and Private Sectors

In many countries (especially in Africa) nongovernmental institutions, often religious organizations, are major health service providers, and private physicians are often as numerous as those in the public sector. In Kenya, for instance, the number of private and nongovernmental hospitals is equal to the number of public hospitals (Government of Kenya 2001), while in Indonesia, 32 percent of hospital beds are private (Gani 1996). This potentially important contribution to the hospital sector may also be underrecognized, particularly in urban settings, where multiple, small facilities may operate without registration, resulting in inaccurate local, regional, and national data on levels of overall service provision. Although few data exist on the effectiveness and quality of these hospitals, the belief is widespread that they may be more efficient than public sector hospitals. This belief is not necessarily borne out by the limited data available (Bitran 1996), and concerns exist about the quality of care provided by private as well as public providers (Brugha and Zwi 1998).

District Hospital Efficiency

Data on hospital efficiency in developing countries are scant. Considerable variability has been observed in the technical efficiency with which surgical services were provided in a small number of Indian hospitals, with differences in total salary costs being the main explanatory variable (Purohit and Rai 1992). Also in India, some evidence has been provided that nongovernmental hospitals may be more efficient, on average, than public hospitals, although considerable variability existed within both groups (Bhat, Verma, and Reuben 2001). In Kenya, public hospitals were found to have an average inefficiency level of 30 percent (that is, the same resources could have achieved a 30 percent increase in output) with significant contributing factors including shortage of appropriate professional staff members, poor combinations of inputs (resources), nonfunctioning theaters and laboratories, lack of transportation, irregular distribution of drugs and supplies,

and frequent breakdowns in medical equipment (Owino and Korir 1997). All these data highlight the critical role of human resources, often a hospital's principal recurrent input cost (see the next section). Underinvestment in or absence of staff or inadequate flexibility in reallocating roles between different health worker groups may prevent hospitals from functioning efficiently (Hensher 2001).

What Are the Costs of Providing Care in District Hospitals?

In a detailed review of actual hospital expenditure, Mills (1990b) identified two input categories that together accounted for two-thirds or more of recurrent expenditure in almost all settings. Salaries varied between 20 and 80 percent and medical supplies between 15 and 58 percent of reported hospital expenditure. These and other data also suggest that, in many countries, costs of referral hospital care are often more than double the cost of equivalent care at district hospitals, although without knowledge on case mix or illness severity such data are hard to interpret (Barnum and Kutzin 1993; Mills 1990b). More recent data collected from seven church-supported hospitals in Tanzania also demonstrate considerable variability in the proportion of costs attributable to salaries and supplies even within a single organization in the same country (Flessa 1998). The strong dependence of hospital costs on salaries particularly cautions against generalizations across countries.

In the following analysis, all original U.S. dollar costs have been adjusted to represent the U.S. dollar cost in 2004. The

Tanzanian nongovernmental hospital data indicate that the average cost per inpatient day derived from 1995 reports (including expenditure on maintenance and expatriate salaries) would equate now to approximately US\$3.60 (range US\$2.60 to US\$6.00) in district hospitals (Flessa 1998). However, if care had actually been provided according to the standards defined by the provider (including recommended staffing levels, building maintenance, and equipment), the estimated cost per day would have risen to the equivalent of US\$11.60 (range US\$9.20 to US\$15.90) (Flessa 1998). This cost compares with costs reported in Kenya in 1993–94 (Kirigia, Fox-Rushby, and Mills 1998), adjusted to 2004 prices of actual inpatient costs per day from two district hospitals of US\$8.30 to US\$10.10, and adjusted 1995 data from a district hospital in Bangladesh of US\$15.90 (McCord and Chowdury 2003). In a middle-income country, South Africa, the cost per inpatient day calculated between 1996 and 1998 and adjusted to 2004 prices in five district hospitals ranged from US\$37.80 to US\$96.30 (Daviaud and others 2000). These data do not necessarily reflect the cost of optimal care, and the Tanzanian study demonstrates that even in externally supported hospitals actual expenditure may be insufficient to provide good-quality care and cover essential maintenance, resulting in steady deterioration of capital stock and worsening efficiency in the long term.

Data describing costs of treating some specific conditions in district hospitals are summarized in table 65.1. Given the difficulties in extrapolating data across contexts and the potentially significant effect of exchange rate fluctuations, great caution

Table 65.1 Costs of Delivering Care at the District Hospital Level

Country and year	Item costed	Cost (original data adjusted to 2004 US\$)	Comment
Kenya, 1993–94, two district hospitals, research study	Treatment of inpatient severe malaria in children	US\$41.50 to US\$132.00 per case treated	Step-down approach to allocate all costs, including capital costs
Zimbabwe, 1994–95, three district hospitals, ^a research study	Medical inpatient stay; HIV/AIDS care	Non-HIV: US\$49.20 to US\$110.00 HIV: US\$133.00 to US\$217.00 per inpatient stay	Bottom-up and step-down approaches used, including capital costs
Zimbabwe, 1999, six provincial hospitals, research study	Severe malaria inpatient care; Pulmonary tuberculosis inpatient care ^b	Severe malaria, mean costs per case US\$26.60 to US\$49.90; tuberculosis, median costs per case US\$22.20 to US\$61.00	Overhead costs purposefully omitted; 1999 exchange rates
Uganda, modeling based on 1997–99 data factoring in program expansion	Aspects of safe motherhood delivered at hospital ^c ; actual and recommended practices	Eclampsia: actual US\$63.40; recommended US\$127.00 Cesarean: actual US\$53.20; recommended US\$57.80 Prenatal care: actual US\$2.90; recommended US\$8.30	Attempt to estimate current program costs and costs if program implemented as recommended; excludes facility costs

Sources: Kenya—Kirigia and others 1998; Zimbabwe 1994–95—Hansen and others 2000; Zimbabwe 1999—Hongoro and McPake 2003; Uganda—Weissman and others 1999.

Note: Shaded rows provide data from studies that did not include overhead or facility costs.

a. Only data from district hospitals are shown.

b. All hospitals had a median length of stay for tuberculosis cases of 10 days or less.

c. Only selected items are shown.

Table 65.2 Estimate of the Effectiveness of a Kenyan District Hospital in Preventing Childhood Deaths in a Rural Community with Good Access to the Hospital

Study site and population: Kenyan rural community with access to basic primary health care services provided by five clinics, three private	Population 51,183; 52 percent younger than age 15
Surveillance period	1991–93
Service provider	Kenyan Ministry of Health district hospital supplemented by research unit
Mortality rates:	
Neonatal	31.5 per 1,000 live births
Infant	58.3 per 1,000 live births
Child	12.4 per 1,000 children ages one to four years
Observed number of admissions	2,223
Admission rate	45 per 1,000 children ages 1 to 59 months per year
Proportion of deaths occurring in the hospital:	
Neonatal	28 percent
Ages 1 to 59 months	30 percent
Observed number of deaths	134
Expected number of deaths without inpatient care based on expert estimates for case fatality rates	349
Lives saved	215
Estimated cost per life saved ^a	US\$104.40

Source: Snow and others 1994.

a. 2004 US\$ equivalent, using admission cost data from Kirigia and others 1998. The estimated cost of the admissions in 2004 US\$ would be $2,223 \times 10.1 = \text{US}\$22,452.30$. This expenditure prevented 215 deaths; average cost of life saved therefore = $22,452.30/215 = \text{US}\104.40 .

should be used in interpreting these data, which, it should be noted, derive in all cases from specific research rather than routine sources.

Measuring the Effect and Cost-Effectiveness of District Hospitals

In the previous section, some limited data on the costs associated with provision of care at the district hospital were presented. What of a hospital's cost-effectiveness? Ideally we would like to know the aggregate health output of a hospital in terms of improved health compared with a situation in which there is no hospital. Such data do not exist, even from industrial countries, where the hospital has been the subject of intense academic study.

However, some attempts have been made to estimate the effect of a hospital by comparing the observed outcome of illness treated with hospital care to consensus expert opinion on the likely outcome of illness in the absence of hospital care. Using this approach in Kenya, Snow and others (1994) estimated that a well-functioning rural district hospital might reduce all-cause child mortality by 44 percent in a population with reasonable access to the hospital (see table 65.2). Extending this approach, researchers in a small rural hospital in Bangladesh calculated the benefit of hospital admission for patients of all ages suffering from life-threatening conditions

using a slightly modified DALY (McCord and Chowdury 2003). Over a three-month period, the total costs (including all staff, capital, and hotel costs) of running the hospital were calculated and divided by the estimated total number of DALYs gained attributable to inpatient care over the same three months. The authors report an average cost per DALY of approximately US\$11.00 in 1995, or US\$13.30 in 2004 dollars (McCord and Chowdury 2003; see table 65.3). This figure compares favorably with costs per DALY of many primary care interventions regarded as highly cost-effective (World Bank 1993). To what extent these results depend on the quality of primary care, the referral system, the inpatient care, the hospital administration, and the commitment of health personnel working for a small independent nongovernmental organization will remain uncertain until more such data become available.

FACTORS INFLUENCING DISTRICT HOSPITALS' PERFORMANCE

The overall macroeconomic policy framework, as illustrated here with reference to financing mechanisms, may often be overlooked as a considerable influence on hospital performance. For the sake of simplicity, other factors (not exhaustively described and illustrated in figure 65.1) are discussed as primarily affecting the demand for hospital services or their supply and may

Table 65.3 Estimate of the Cost-Effectiveness of a Nongovernmental District Hospital in Rural Bangladesh

Study site and population: Rural Bangladesh, with community served by four peripheral clinics	Population 160,000
Surveillance period	July through October 1995
Service provider	Independent nongovernmental organization
Major causes of death	74 percent under-five mortality attributable to perinatal deaths; maternal mortality ratio high
Admissions analyzed	541 (33 percent obstetric/gynecological problems)
DALYs gained by hospital services:	
Adult medical	177.0 life years; 6.5 disability years
Surgical	459.4 life years; 236.3 disability years
Pediatric	371.5 life years; 10.8 disability years
Obstetric/gynecological	897.5 life years; 125.4 disability years
Newborn (resulting from ob/gyn interventions)	1,024.3 life years
Total DALYs gained	3,308.7
Cost per DALY	US\$10.93 in 1995 (\$13.30 in 2004 US\$)

Source: McCord and Chowdury 2003.

operate at both national and local levels. The way some of these diverse factors affect people's daily lives is illustrated in box 65.1. What is clear is that failure to tackle these many challenges all too often results in facilities that fail their communities.

Central Financing Mechanisms

Three broad methods of government financing of public district hospitals are generally used: prospective with a fixed budget, prospective with revenue depending on activity, and retrospective in proportion to actual costs. The fixed budget is widely used, often based on historical spending levels, with a (frequently inadequate) provision for price changes. Such a system clearly can secure good expenditure control and is administratively undemanding. However, it can often perpetuate historical inequities and fail to respond to new demands and priorities. Moreover, fixed budgets offer few incentives to maximize the effectiveness, quality, or quantity of care offered by hospitals (Barnum, Kutzin, and Saxenian 1995).

Indeed, many budget systems continue to finance hospitals through line-item budgets directly from the ministry of health or finance. Such mechanisms allow central bureaucracies to exert the maximum level of control over peripheral spending with little or no capacity at peripheral levels for flexible use of funds in response to local needs. Thus, centralized budget systems can contribute to technical inefficiency by preventing local managers from optimizing the deployment of inputs. In contrast, global fixed budgets provide for central control of total spending but may permit increased independence when allocating funds at a local level. Fixed budgets based on capitation payments can be more sensitive to local needs than incremental budgeting and can contribute toward equity objectives.

However, they demand technical skill and accurate data at the central level, especially if capitation payments are adjusted for differences in population health status or other needs.

Financing based on activity levels (such as the diagnosis-related group methods in widespread use in high-income countries) are similarly demanding of central-level capacity and also require considerable competence and probity at more peripheral levels of the administration. However, such financing might be an essential prerequisite of insurance-based mechanisms. In contrast to fixed budgets, it has the potential for encouraging supplier-induced demand—the greater the hospital's income, the more services it provides. It produces some incentive to reduce unit costs. Expenditure control may be difficult unless a cap is put on the aggregate hospital sector budget.

Retrospective reimbursement of actual costs is a discredited system of financing hospitals because it offers no incentive to control costs or manage demand. In its favor, it may stimulate higher-quality care. In practice, many health systems use a mixture of all three payment mechanisms, with broadly fixed budgets, sometimes adjusted for changes in demand, and some element of retrospective reimbursement for unplanned activity. In general, no one strategy is perfect. However, the considerable demands on management for some schemes imply that a global budget, ideally based on population needs, in conjunction with some form of quality-monitoring system may be the most appropriate way forward for many developing countries (Barnum, Kutzin, and Saxenian 1995).

Mechanisms permitting local income generation (cost recovery, cost sharing, facility improvement funds, and local taxes) may be superimposed on any of these schemes. Such devices can help countries shift toward a local, more needs-based allocation of financing and help promote accountability

Box 65.1

Hospital Performance: Perspectives from a Sub-Saharan African Country

Caretaker (C) and health worker (HW) experiences of hospital care:

“When the doctor realized my child was breathless he quickly called us into the office even though I was at the back in the queue.” (C)

“The [nursing] sister came and talked to me and asked if I had a problem, and I felt good and cared for.” (C)

“Things here have greatly improved; the ward is clean and the treatment prompt. We are happy and hope that this will continue.” (C)

“I admitted a patient in very poor condition with malaria and anemia and I managed to remove blood for cross-match and fix a line, start on oxygen, and get the doctor. Blood was started quickly, and the child rapidly improved.” (HW)

“I resuscitated a baby with severe asphyxia, and it successfully came up. The success was because I had attended a course in basic life support skills for neonates.” (HW)

Caretaker and healthworker descriptions of referral to hospital:

“If you do not have the money, you have to look for it first. Sometimes you may even have to spend a day or two looking for the money for the treatment. If you have coffee,

then you sell it before you go.” (C) (Peterson and others 2004).

“I spent a long time in MCH [Maternal and Child Health]; the doctor wanted money before he would see me, and I did not have any.” (C)

“There is a lot of suffering when it comes to drugs because they are usually not enough and most of the time the mothers do not have money.” (C)

“I want to know everything about the illness; I asked the nurses, but they refused to explain, so I got disheartened from asking anyone.” (C)

“I had a patient with anemia and mild marasmus, and the mother waited for three hours in the lab for an Hb only to be turned away as she had no money. Then I went to get the child some milk, and I was turned away as the storeman said it was too late. The child had to wait until the next day.” (HW)

“A child with severe LRTI [lower respiratory tract infection] was very dyspneic on admission. Only one cylinder of oxygen was available, but we started giving it to the child, and the condition improved. The condition became worse when the oxygen ran out, and there was none left; he started gasping and died.” (HW)

Source: English and others 2004a, unless otherwise noted.

by focusing local attention on the efficiency and quality of local services. This flexibility presupposes that those empowered with authority have the skills and freedom to make and execute plans. The experience of such a decentralized policy on district hospital or district health system performance is mixed, with a lack of real transfer of authority reducing effectiveness in some areas (Blas and Limbambala 2001), while more balanced and carefully implemented mechanisms of decentralization may be productive (Bossert and others 2003).

The specific effects of requiring out-of-pocket payments to access health care are a matter of fierce debate. Although some data suggest an improvement in allocative or technical efficiency, other data do not (Arhin-Tenkorang 2000; Van der Geest and others 2000). It has been suggested that an improved quality of service may overcome the cost barrier to access (Van der Geest and others 2000). However, the likelihood that the poor will be excluded from hospital care is a major concern. There is also an increasing tendency to encourage district hospitals to provide some beds with an enhanced level of professional

attention and hotel services (sometimes referred to as *amenity beds*) as a means of generating profit; reports indicate that the fees levied may not even cover the cost of the enhanced service, let alone generate extra revenue with which to cross-subsidize services for the poor (Flessa 1998; Suwandono and others 2001).

Demand for Services

Patients' demand for services may be influenced by a wide variety of factors, many of which have little to do with the hospitals themselves. Patients' perceptions of the severity of their illness, cultural beliefs, physical accessibility, and financial and opportunity costs together with the performance of the peripheral health unit screening process all potentially limit the effectiveness of the referral mechanism and thus the hospital (Font and others 2002; Siddiqui and others 2001). Recent data highlighting the inability of many families to meet the financial costs of hospital referral (Peterson and others 2004) and the

potentially catastrophic consequences of severe illness (Xu and others 2003) underscore the importance of financial barriers, especially for the poor. Not only are there obvious implications for health generally, but underusing service capacity also reduces efficiency and increases the costs per case of hospital care. Improving the efficiency and effect of a hospital may, therefore, be best achieved by tackling factors that influence demand—for example, providing emergency transport and limiting out-of-pocket expenses. However, often a concern exists that the provision of free high-quality services may itself promote unnecessary demand—the so-called moral hazard. In addition, the relative importance of demand factors may vary considerably in different settings, for example, in urban and rural areas, making universal rules unhelpful.

In the context of PHC, it is suggested that high demand for services provided by hospitals rather than peripheral clinics, driven by a perception that hospitals provide higher-quality service and resulting in bypassing of the PHC level of care, is inefficient. It has been proposed that hospitals be specifically prevented from delivering PHC services (WHO 1990). However, the view that patients who bypass PHC increase the costs to the provider may not always be true (Siddiqui and others 2001). Patients may also choose to bypass the district hospital and proceed directly to referral hospitals, often increasing the costs of care if the condition could have been treated in the lower-level facility. The perceived quality of care at the district level may be a major determinant of this behavior, with some data suggesting that improved district services increase use rates (Barnum and Kutzin 1993), potentially making district hospitals more cost-effective but more costly.

The Supply of Services

A fundamental role of policy makers is to determine the geographical distribution of hospitals and the functions they should undertake. These decisions are often severely circumscribed by topography, historical accident, and political imperatives, as well as by the level and quality of resources that are available. Often, changes can be made only incrementally, building on an existing structure of administration and capital that may not be in any sense optimal.

Nevertheless, many of the factors determining the quality of supply are theoretically under the influence of local management personnel, who are in a potentially powerful position to significantly affect a hospital's function. Lack of resources, low morale, inability to attract staff members to hardship areas, poor training, and inadequate supervision among many other factors may all conspire to prevent health workers from executing their duties effectively or even at all. Those factors may, in turn, result in less demand for services from consumers, who opt to avoid the hospital or go elsewhere for treatment. The paradox resulting from this decline is that the hospital may

continue to operate within a fixed budget, thereby satisfying finance ministries but having little or no effect on health. Long-term underinvestment in facilities and skilled, motivated staff may then condemn a health system to many years of underperformance, given the time necessary to address these issues. This is the fundamental reason for seeking to measure system outputs and quality as well as costs.

On a regional or national scale, the actual distribution of hospitals and personnel may work for or against effective service delivery. For political reasons (to reward a community or to honor a powerful politician, for instance), hospitals may be situated in areas that would not be chosen if purely rational plans had been followed. Nongovernmental providers or philanthropists may build or alter hospitals without regard to the overall function of a health system or achieving either equity or efficiency. Public, private, and nongovernmental hospitals may compete for patients, potentially reducing efficiency in some or all sectors. The crisis of inadequate personnel in low-income countries, which limits the range, quality, and quantity of services that can be offered, has been described (Narasimhan and others 2004). However, imbalances in the within-country distribution of staff members are less well publicized and equally damaging. All the factors mentioned and others are commonly encountered in health systems of developing countries and are major barriers to implementing potentially valuable interventions at an operational level (Oliveira-Cruz, Hanson, and Mills 2001). New interventions must therefore often be considered in the light of existing (rather than optimal) levels of service provision and performance. Little literature is available on these public choice features of decision making.

EFFECTING CHANGE WITH CROSS-CUTTING INTERVENTIONS

So far this chapter has outlined concepts fundamental to understanding the position, functions, and performance of the district hospital and has presented some of the existing (though limited) data on costs and cost-effectiveness. Operating at the interface between primary care—aimed often at the poor—and the more Western biotechnological model of care at secondary and tertiary levels—often more accessible to the better off—district hospitals are easy to ignore because they lack any advocates for their role. However, optimizing their role to maximize health benefits and promote equity does demand the following:

- explicit policy decisions about the services that should be offered at this level and about the balance between primary care, district hospital care, and higher-level care services provided

- national strategies on the distribution of services that encompass all providers
- commitment to provision and equitable distribution of essential human resources and supplies
- systems for monitoring hospital performance in terms of efficiency and quality and for intervention when performance is poor.

When a framework defining the district hospital is available, interventions that might improve performance can be considered. The focus here is on cross-cutting interventions rather than condition-specific or service area-specific interventions described elsewhere. Cross-cutting interventions seem to be rarely prioritized but have the ability to add value in many areas and are perhaps critical when thinking of developing an improved health system.

Human Resources

Key issues that affect district hospitals are the quantity and quality of personnel and their range of skills. Staff members should be appropriate to the tasks they are asked to perform. This approach may mean continuing to use nursing or auxiliary staff members with more limited training in district hospitals because they may be more cost-effective, running against the tide of rising academic requirements often demanded by professional associations (AED 2003). Similarly, devolving some tasks to lower cadres of staff may be practical and much more efficient—for example, training and licensing clinical assistants to perform emergency surgery including cesarean section. Such initiatives, too, may face opposition from powerful professional vested interests. Although some tasks may be transferred downward, a problem often faced by district hospitals is an absence of high-quality senior staff members or leaders. Traditionally, running a district hospital has commanded less respect and remuneration than work at a secondary or tertiary facility and has been regarded as a stage to be moved through as rapidly as possible. Arguably, the challenges to a district hospital professional are at least as great as those of a tertiary consultant specialist, and the development of appropriate skills-training programs, and parity of postgraduate qualifications and pay, might help foster the development of a professional group that improves performance and fills a much needed advocacy role.

Improving Clinical Management

For more than a decade, industrial countries have increasingly promoted the use of the best evidence in clinical management. Clinical guidelines, means to implement them, feedback on their use and value, clinical audit, and performance review are all now the subject of considerable research, with some

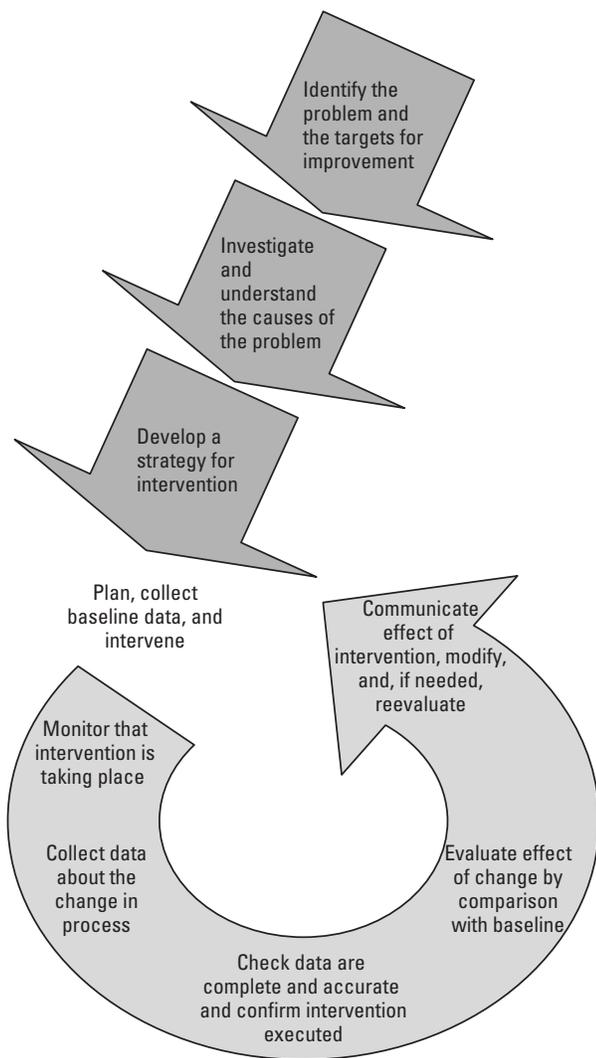
evidence of benefit particularly when part of a broadly based approach (Grol and Grimshaw 2003). District hospitals in developing countries have largely missed out on this revolution, which may be of particular value in settings where care by nonspecialists with little or no access to recent information is the norm.

Information and Integration

Although much focus is given to technological development in the fields of diagnosis, treatment, and imaging, relatively little attention is paid to the potential for technology to change the collection and use of information, despite the possibly major effect on improving administrative and clinical management. As at the primary care level, where many of the interventions are currently available to achieve significant reductions in mortality (Claesen and others 2003), many of the tools that could be used to improve health are well known at the district hospital level. Making better use of these tools through more reliable provision, better training, improved information collection, on-the-spot analysis of data, and real-time use of the results for service planning might be both possible and of considerable benefit (Cibulskis and Hiawalyer 2002). Clearly, how a hospital is performing as part of an integrated primary care system is also vital. Local information on population health, on use and referral patterns, and on success and the reasons underlying successes and failures is invaluable if the hospital is to respond to the particular needs of its locality.

Quality Improvement and Accreditation

Quality improvement is a generic technique adapted from industry that involves a rolling approach to identifying problems, solving them, and assessing the results of change (see figure 65.3) and that has been institutionalized in hospital care in many developed countries (DiPrete-Brown and others 1993). An essential first step is defining standards for service provision, which can span all areas, including the technical content of care, the physical environment in which care takes place, and interpersonal relations between patients and health workers. This approach is often linked to formal systems for external assessment of hospitals' performance and accreditation. Accreditation may serve as a goal for participating hospitals, a means of promoting positive competition, and a means of identifying poorly performing institutions. Potential advantages of such initiatives are empowerment of local service providers to solve problems they feel are important and the overall aim of working toward a systemwide standard of care. However, although an obvious need exists for quality improvement in hospitals in developing countries (English and others 2004b; Nolan and others 2000), few examples exist of hospital-level interventions in industrial or developing countries that



Source: Adapted from Massoud and others (2001).

Figure 65.3 Quality Improvement Process

provide evidence of effect on major outcomes. One exception is a broadly based quality improvement intervention targeting maternal and child health in Peru that focused on the entire system of care. This project was associated with a 25 percent decrease in maternal deaths in program areas (see box 65.2 for details). However, the relatively poor progress of an operational-level quality improvement and accreditation program in Zambia's hospitals highlights the significant problems of intervening in countries with poorly functioning health systems that are severely constrained by lack of resources (Bukonda and others 2002).

Hospital-Acquired Disease

Probably the most important infection in developing countries that can be acquired as a result of hospital care is HIV, espe-

cially in Sub-Saharan Africa. Reuse of needles and blood transfusion are the main sources of infection and also carry the risk of hepatitis B and C and other viral infections important in their own right. It has been estimated that effective measures to improve blood safety in particular are a highly cost-effective intervention at approximately US\$8 or less per DALY (Creese and others 2002).

Nosocomial infection, another major adverse consequence of admission to hospital, is common in some settings in industrial countries, contributing significantly to hospital costs. Historically, relatively simple approaches to prevention have proven reasonably effective with additional effect from dedicated prevention services (Ayliffe and English 2003). The potential effect of intervention in district hospitals in developing countries is largely unknown, although in China nosocomial infection rates of between 8 and 13 percent have been reported (Barnum and Kutzin 1993). Because overcrowding and lack of basic resources, even water, are common in some districts, the potential for simple cost-effective interventions to prevent such infections seems high.

Other Managerial Initiatives

In high-income countries, numerous other initiatives are being tested to promote improved efficiency and quality. They often rely heavily on having in place appropriate institutional arrangements, managerial capacity, and information systems, so their feasibility for local implementation is highly dependent on local circumstances. One of the most widely tested arrangements within public national health systems has been the experiment with internal markets, in which a range of public hospitals compete for contracts from separate public service purchasers, such as local governments. The split of purchaser and provider of public services is recognized as a potentially powerful instrument for securing efficiency improvements but can be demanding in terms of managerial skills (Le Grand, Mays, and Mulligan 1998).

A less direct way of introducing some form of competition into the hospital market is to require hospitals to publish performance reports that allow direct comparisons to be made between hospitals.

An alternative to relying on indirect methods of influencing behavior is to give physicians incentives or instructions to deliver care in line with guidelines reflecting best practice. In the United States, numerous experiments have been carried out under the general banner of managed care (Glied 2000), and other systems have attempted analogous approaches to hospital regulation. At one extreme is the centralized U.K. system of performance management, under which hospitals are given challenging and immediate targets and are rated according to measured outcomes (Smee 2002). At the other extreme is the system of guided self-regulation practiced in the Netherlands, under

Box 65.2

Prevention of Maternal and Child Deaths from Improvements in the Quality of Health Services: An Example from Peru

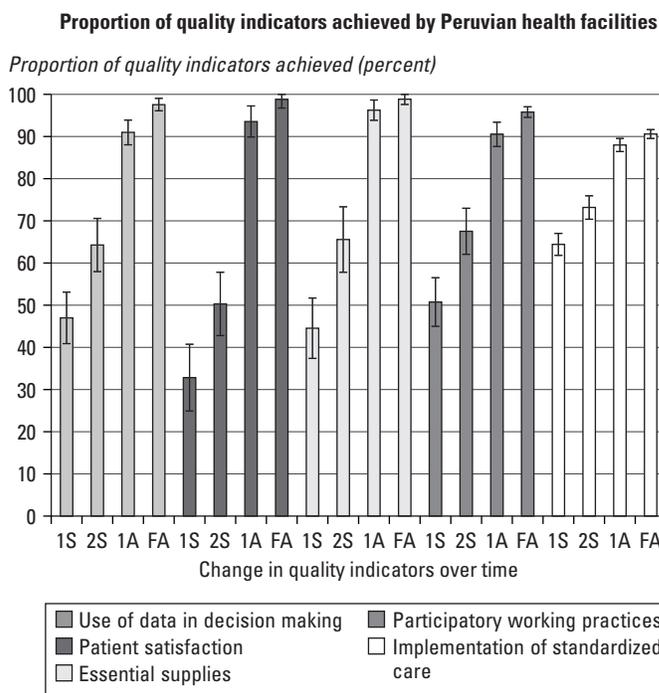
Recognizing the failure of previous training attempts to improve the quality of health services, the Ministry of Health, with support from the U.S. Agency for International Development and the participation of local institutions, developed an innovative program in Peru. Aiming to reduce maternal and perinatal deaths, the program expected to increase use of health services by improving quality and by strengthening links between the health services and their communities by working with midwives and community health workers. Multidisciplinary teams implemented a quality improvement program in approximately 2,500 health facilities, focusing on

- standardizing care
- ensuring the availability at all times of essential supplies and equipment
- making use of existing information systems and doing small operational studies to generate data at the local level to facilitate decision making
- promoting the participation of all personnel in a concerted and agreed-on plan of action
- measuring patients' satisfaction over time and addressing the causes of complaint.

Training activity mainly involved use of a participatory problem-solving technique. In parallel, health networks in each health region participated in a program to work with 1,143 midwives and 2,549 community health workers, under the coordination of a health facility member who was part of the multidisciplinary team.

Supervision and evaluation at each facility occurred three and six months after training and before accreditation visits. A tiered accreditation system was developed to promote participation and provide an incentive for improving quality. Results of each evaluation were presented to the Ministry of Health, which made accreditation decisions through an independent institution to generate political support. Quality in five areas (corresponding to the program aims) was assessed. Significant improvements were observed in the proportion of indicators achieved in all five aspects of quality evaluated (box figure). An evaluation one year after the end of the program found that performance had declined but remained at 60 to 80 percent of the levels achieved at accreditation.

Sources: Lanata, Butron, and Espino 2002; Ministerio de Salud, Peru 2001.



Note: Proportion of quality indicators (with 95 percent Confidence Index) measured in the five domains achieved by health facilities at first supervision visit (1S), second supervision visit (2S), first accreditation visit (1A), and final accreditation visit (FA).

By the end of the three-year program (1996–99), demand for health services had increased considerably, the success itself creating managerial problems in many instances. Motivation and satisfaction of patients and health workers had also increased, and revenue collected (through fee-for-service payment) at the facilities rose. Maternal mortality in the regions included in the program was 60 percent higher than in other regions at the start of the intervention period and fell 25 percent after the intervention, while no change was observed in the other health regions. The inequitable distribution of maternal mortality was narrowed to a 20 percent excess in intervention areas. A national demographic and health survey examining Peru between 1995 and 2000 found a significant overall reduction of maternal mortality, increases in prenatal care coverage, and a higher proportion of deliveries in health facilities or attended by health professionals.

which hospitals are required to engage in quality improvement but are given no prescription as to what format that effort might take (Klazinga, Delnoij, and Kulu-Glasgow 2002).

THE FUTURE: RESEARCH AND INFORMATION NEEDS

A few fundamental and urgent needs must be met as a prerequisite to improving understanding of district hospitals in low- and middle-income countries, although tackling these issues may be far from simple:

- developing and accepting meaningful performance indicators in conjunction with developing appropriate standards of care
- collecting higher-quality routine data from district hospitals
- improving understanding of the costs and health consequences of different, evidence-based, service provision portfolios proposed for district hospitals and improving understanding of the marginal benefits of incremental additions and their implications for planning infrastructure and estimating human resources and technology needs.

A solution to the first issue would perhaps pave the way for and enhance the value of further focused research in a number of areas.

Implications of a Changing Disease Spectrum

In many middle-income and some low-income countries, the demographic transition to noncommunicable diseases— notably cardiovascular, smoking-related, and malignant diseases—will have considerable implications for the hospital sector. Thus, hospital costs likely will rise as older patients with chronic diseases become an increasing proportion of inpatients (Barnum and Kutzin 1993). In some cases, the relative cost-effectiveness of hospital care will improve compared with further expansion of primary or preventive services that incur increasing marginal costs (Barnum and Kutzin 1993).

More immediately, in low-income countries in Africa, the massive impact of the HIV pandemic is most easily seen in the continent's hospitals. Bed occupancy is rising, and hospital stays appear to be lengthening, as an increasing proportion of hospital admissions, now over 50 percent in some countries' medical wards, have HIV-related disease (Mpundu 2000). Those diseases associated with HIV infection, notably tuberculosis, and changing demands for care, such as the need for palliation, may change not only the workload but also the nature of the demands placed on the service. The advent of antiretroviral therapy, which might ameliorate some of these problems, will itself place great demands on the hospital service provision mechanisms. With or without new drugs, HIV will continue to tax both planners, who have to

respond to a rapid change in needs, and health care financing. Research that permits hospitals to tackle these new challenges and develop efficient and cost-effective strategies to provide care for HIV-related disease while preventing a decline in care standards for HIV-uninfected patients is a high priority.

Accounting for Case Mix and Case Severity When Measuring Hospital Performance

Overall inpatient-fatality rates and case-fatality rates of different common diseases are often included in district hospital performance measures. These are crude measures unless some adjustment is made for case mix when describing inpatient fatality and for severity of illness when describing case fatality. Alternatively, hospital outcomes should perhaps be replaced as key indicators of performance by carefully chosen process indicators, which are likely to be more generalizable tools of performance monitoring that offer the advantage of specifically identifying areas that require improvement (Lilford and others 2004).

Implications of Emerging and Existing Technologies

Technology has had an enormous effect on the amount of information available to clinicians and managers in industrial countries, from new rapid diagnostic tests to automated stock-checking and ordering procedures. A particularly exciting potential in developing countries may be the ability to undertake and interpret many diagnostic tests remotely, thereby enabling district hospitals to operate without a skilled diagnostic staff on site. It also seems probable that appropriately targeted technology could have a major effect, not least in the generation, communication, and analysis of hospital use, cost, and outcome data, without which the health system cannot identify and respond to needs.

Interventions That Improve Performance

Interventions aimed at improving hospital administration and clinical management at the district hospital level warrant investigation. For clinical management, interventions such as clinical guidelines, supervision, and feedback; audit and continuing professional development; quality improvement strategies and accreditation; and improvements in referral and integration with PHC may improve district hospital performance and be relatively cost-effective. Such interventions deserve attention, along with more traditional research aimed at optimizing treatment of specific diseases.

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