

FUNCTIONS, STRUCTURE, AND PHYSICAL RESOURCES OF HEALTHCARE ORGANIZATIONS

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Chapter Focus

The key idea of this chapter is that form follows function, and function defines structure. Healthcare organizations vary—not only from country to country, but also within each country—as they address issues of access, quality, and cost that are influenced by social, economic, and political factors. The principles described in this chapter can be applied to ambulatory, acute, chronic, and home care organizations with varying levels of resources and local organizational response capacity. The first section of this chapter examines the key functions of healthcare organizations, with an emphasis on the need for a continuum of patient-centered care. Later sections review the main components of healthcare organizations and the ways they interact to achieve desired outcomes and performance improvement. The chapter explores ways of designing, structuring, and analyzing organizations to effectively and efficiently manage physical resources and carry out key functions.

Learning Objectives

Upon completion of this chapter, you should be able to

- distinguish the key functions of healthcare organizations and relate them to the priorities of access, cost, and quality;
- develop mechanisms to assess the performance of healthcare organizations;
- design a structure for an organization that takes into consideration the resources available in a given community to achieve the best possible health outcomes;

- plan and prioritize the physical resources needed to effectively accomplish the organization's key functions, taking into account the available resources in that particular system; and
- integrate physical, human, and technological resources to provide appropriate clinical, support, managerial, and supply chain services in a healthcare organization, taking into consideration all legal, accreditation, and regulatory mandates.

Competencies

- Demonstrate an understanding of system structure, funding mechanisms, and the way healthcare services are organized.
- Balance the interrelationships among access, quality, safety, cost, resource allocation, accountability, care setting, community need, and professional roles.
- Assess the performance of the organization as a part of the health system.
- Use monitoring systems to ensure that corporate and administrative functions meet all legal, ethical, and quality/safety standards.
- Effectively apply knowledge of organizational systems, theories, and behaviors.
- Demonstrate knowledge of governmental, regulatory, professional, and accreditation agencies.
- Interpret public policy, and assess legislative and advocacy processes within the organization.
- Effectively manage the supply chain to achieve timeliness and efficiency of inputs, materials, warehousing, and distribution, so that supplies reach the end user in a cost-effective manner.
- Adhere to procurement regulations in terms of contract management and tendering.
- Effectively manage the interdependency and logistics of supply chain services within the organization.

Key Terms

- Facility design
- Healthcare system
- Health technology assessment
- Prearchitectural medical functional program
- Regionalization
- Sustainability

Key Concepts

- Facility design
- Facility management
- Low-resource management
- Medical equipment
- Operations management
- Organizational design
- Performance improvement
- Physical resources management

Introduction

We can define the most important functions of healthcare organizations using a systemic analysis inspired by Avedis Donabedian's (1988) original conception of structure, process, and outcomes. Exhibit 1.1 shows how, as the population and the healthcare organization interact, the system aligns the available or required resources to produce the key notions of utilization, access, productivity, efficiency, and effectiveness, which interact to shape the organization's performance. Performance, meanwhile, depends on the competent actions of healthcare managers and other human resources in the organization.

Since the mid-1900s, the functions, responsibilities, and competencies of healthcare managers have developed in different ways around the world. In the United States and Canada, the role primarily developed as a postgraduate specialty supported by the W. K. Kellogg Foundation under the umbrella of

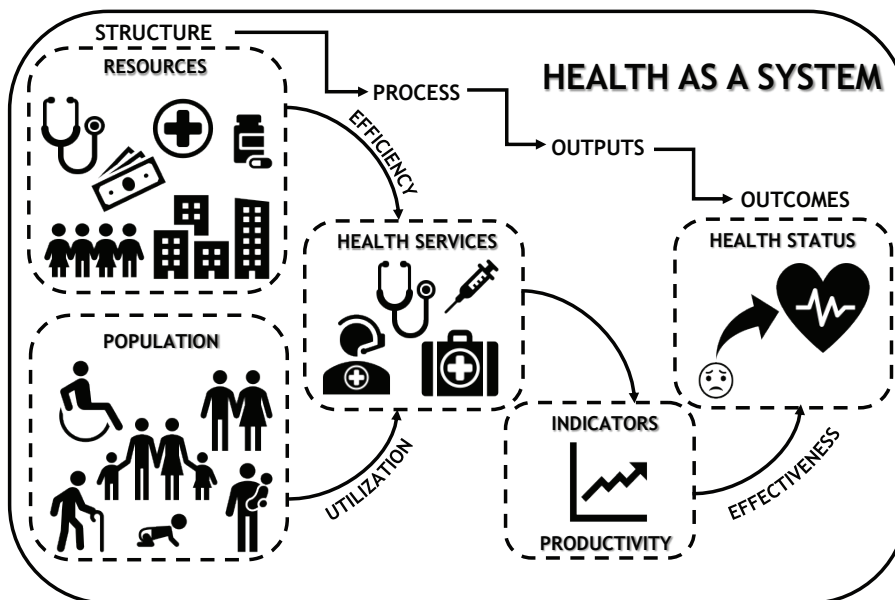


EXHIBIT 1.1
Elements of the health systems analyzed with a systemic approach

Sources: Bradbury, and Ramirez-Minvielle (1995); Donabedian (1966).

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the Association of University Programs in Health Administration (AUPHA). A handful of university programs were established in 1948. As demand grew and the healthcare field expanded, new graduate and undergraduate university programs developed in a number of schools related to health or management disciplines (Counte, Ramirez, and Aaronson 2011).

Around the world, a number of countries—and a number of locations inside countries—have developed a strong alignment of professional healthcare managers across healthcare organizations; other locations, however, have almost no notion of healthcare management as a profession. In some countries, clinicians are promoted to serve in managerial roles at healthcare organizations without first having had the opportunity to acquire management competencies (West et al. 2012). The International Hospital Federation (IHF) has created a special interest group in health management to promote the professionalization of the discipline and the use of a leadership competency framework to improve the impact of managers at all levels of organizations and health systems (IHF 2015).

The main functions of **healthcare systems** and organizations in the continuum of care are financing, provision of health services, stewardship, and resource development (Frenk, Gómez-Dantes, and Moon 2014). Of these functions, provision of health services and resource development are key, and they are the ones further explored in this chapter. Provision of health services starts with sound planning and effective/efficient organization. Financing is addressed in chapters 2 and 3, and stewardship is discussed in chapters 6 and 11.

healthcare system

The arrangement of people, institutions, and resources that deliver healthcare services to meet the needs of a target population. The system's framework aligns resources to support the key performance domains of access, utilization, efficiency, quality, sustainability, and learning.

The Performance of Health Systems: Six Core Domains

Healthcare organizational performance around the world was the focus of an extensive study sponsored by the World Bank, in which investigators conducted a thorough literature review and developed a guide to concepts, determinants, measurement, and intervention design (Bradley et al. 2010). The World Bank report examined six core performance domains:

1. Access
2. Utilization
3. Efficiency
4. Quality
5. Sustainability
6. Learning

The first four domains are related to the “iron triangle” of healthcare, a concept that was introduced by Kissick (1994) and later provided the basis for the “triple

aim” initiative developed by the Institute for Healthcare Improvement (IHI). Kissick’s iron triangle consists of access, quality, and cost containment, whereas the IHI’s “triple aim” adds the dynamics of population health (IHI 2012).

Access incorporates several dimensions—physical access, financial access, linguistic access, and information access—that are supplemented by service availability and the provision of nondiscriminatory services. Equitable treatment should be provided regardless of gender, race, ethnicity, religion, age, or any other physical or socioeconomic condition. Utilization includes dimensions of patient or procedure volume relative to capacity or population health characteristics. Efficiency is determined by cost- or staff-to-service ratios and by patient or procedure volume. Quality includes clinical and management quality, as well as patient experience.

The last two domains—**sustainability** and learning—are key to ensuring constant, self-propelled growth in an ever-changing, complex environment such as healthcare. *Sustainability* in healthcare can be defined as “the capacity of health services to function with efficiency, including the financial, environment and social interaction that guaranties an effective service now and in the future, with a minimum of external intervention and without limiting the capacity of future generations to fulfill their needs” (Ramirez, Oetjen, and Malvey 2011, 134). Sustainability can be considered from two distinct perspectives or dimensions. The first perspective focuses on the sustainability of processes that create a basic functional network throughout the organization, allowing for flexibility and quality improvement—both of which are necessary for the dynamic change environment of healthcare. The second perspective deals with organizational sustainability, and it includes five multidimensional pillars:

sustainability
The capacity for a healthcare organization to function efficiently and in a manner that supports effective service both presently and in the future.

1. The *environmental pillar* represents the initial point of focus for sustainability, and it includes—but is not limited to—the use of clean and renewable energy and the conservation of the natural environment. This pillar incorporates recycling techniques to preserve the quality of the atmosphere, to reuse solid and liquid waste, and to safely dispose of contaminants.
2. The *sociocultural pillar* strengthens community support and promotes the identification of key cultural, ethnic, and other values among the community of staff, patients, and users. It incorporates population health and social marketing strategies.
3. The *institutional capacity development pillar* promotes the strategic management of the organization. It aims to strengthen competencies at all levels and instill an empowering knowledge management culture, facilitating coordinated efforts of governance, leadership, and personnel integration and participation.

4. The *financial pillar* ensures the delivery of healthcare programs and activities that are cost effective and efficient in the use of resources. It is indispensable for achieving the organization's goals and objectives.
5. The *political pillar* involves staff, patient, and community advocacy to advance the interests of the organization.

Finally, the learning domain empowers the organization to adapt to change and to explore and adopt innovations. It incorporates efforts to use data audit and feedback processes, to distribute relevant information and provide patient education through partnerships with the constituency, and to implement training and continuing education initiatives for the healthcare workforce.

The Challenge of Organizing Health Services Resources to Achieve Optimum Performance

The provision of universal access to optimal prevention, care, cure, and rehabilitation can be considered an ultimate goal of healthcare. Most governments, either directly or indirectly, subscribe to this goal; the challenge is—given the limitations of resources and entrenched infrastructure—achieving the greatest possible return on the investment toward reaching it. All countries, regardless of their level of wealth or industrialization, are limited in their ability to achieve this goal, often because of political philosophies expressed as public policy. Even those nations in the most favorable positions often lack the will or capacity to translate their knowledge of what is possible into practice for the benefit of all people.

Over many years of technological development and interaction among professional, political, and economic forces, three enduring organizational foci have emerged for achieving the optimum health status for a population. They are (1) hospitals, (2) primary care provision, and (3) regionalization.

Hospitals

In every country, hospitals are the most visible symbol of healthcare development and care for the sick. They represent public assurance that there is a place for people to go for care when needed. Hospitals are also important economic engines, generating employment and anchoring the economies of communities. They consume a large portion of the health sector resources in many countries.

The hospital is arguably the most complex contemporary organization to manage. Hospitals, particularly in developing countries, struggle internally with inadequate management and governance; limited sources of income; insufficient human resources; poorly planned, financed, and maintained physical plants; and rudimentary quality controls. At the same time, they are often

buffeted by such external forces as regulations, competition, inadequate payment systems, and conflicting service demands.

Experts from a number of countries, the World Health Organization (WHO), and the international development agencies of industrialized nations came together in an extraordinary meeting to address the challenges facing hospitals today and going forward (German Federal Ministry for Economic Cooperation and Development [BMZ] / German Corporation for International Cooperation [GTZ] and WHO 2010). The meeting was based on the premise that the role of hospitals should change within the upcoming decade, and it sought to clarify the critical issues concerning hospital reform. It also sought to formulate a plan to address those issues. There was no official follow-up to the meeting, but the consensus sent a powerful message to the policy community. The key issues identified by the meeting are as follows (BMZ/GTZ and WHO 2010):

- Clarifying the role and function of hospitals in the health system
- Political dimensions and expectations of hospitals
- Hospital isolation in the face of blurring demarcations
- Linkages between hospitals and other levels of the health system
- Cost and benefit of technological progress
- Data to measure hospital performance in relation to population outcomes
- Universal coverage and accessibility
- Hospital financing within overall health spending
- Hospital governance and autonomy
- The legal framework within which hospitals operate
- Human resources
- Involvement of private hospital actors
- Hospitals in a global health marketplace
- Hospitals and the wider economy

There is no better summary of the challenges facing hospital and health system administrators and planners.

Primary Care Provision

The development of primary care has emerged as the central strategy to achieve universal access, comprehensive care, and cost containment, not only in developing countries but also in industrialized countries. The goal for low-resource societies is to provide essential services that are realistically within their reach, with community participation. WHO (1978) has promoted primary care development since the Alma-Ata Declaration of 1978. The declaration was

formulated by public health leaders who were largely committed to the position that healthcare is a right and that the state has the responsibility to provide it.

Alma-Ata created an enduring tension between two “ideal” models—a hospital-centric ideal model of health system development, with overtones of private practice and specialization, and an ideal model based on publicly supported community-based primary care providers, with the hospital in a supporting role. The conflict between the two ideal models was summarized by Frenk, Ruelas and Donabedian (1989, 1):

In most developing countries the concern is that . . . [hospitals] already absorb such a high proportion of resources that they seriously threaten any effort to achieve full coverage of the population. Furthermore, it is widely believed that a health care system centered around hospitals is intrinsically incompatible with the geographic, economic, and cultural attributes of many populations. In addition, the mix of services offered by hospitals . . . is believed to poorly match the prevailing epidemiologic profile and the population needs for preventive and continuous care.

Gillam (2008, 537) assessed the practical impact of the Alma-Ata Declaration on governments’ policies and actions, noting that “early efforts at expanding primary care in the late 1970’s and early 1980’s were overtaken in many parts of the developing world by economic crisis, sharp reductions in public spending, political instability, and emerging disease. The social and political goals of Alma Ata provoked early ideological opposition and were never fully embraced in market oriented, capitalistic countries. Hospitals retained their disproportionate share of local health economies.”

In setting out a model of a preferred future, the WHO (2008, 55) states: “Primary-care teams cannot ensure comprehensive responsibility for their populations without support from specialized services, organizations and institutions that are based outside the community served . . . [and] typically concentrated in a ‘first referral level district hospital.’” Assuming that, in many countries, most of the existent service deliverers are controlled by the system designers, the model calls for coordination of all resources to be vested in the primary health team, presumably mandated by law in most cases. Under that premise, “The primary-care team becomes the mediator between the community and the other levels”(WHO 2008, 55).

It is important to emphasize that primary care systems are ultimately dependent on hospitals. To be comprehensive, a system must have a hospital available to treat complicated, often life-threatening cases. The system also must be able to receive trauma cases from rural employment and transportation situations that far exceed the competencies and resources of primary care. Patients who are unable to access community and primary care services have been known to travel great distances to reach the nearest hospital in case of emergency.

Regionalization

Regionalization is the third enduring organizational focus, but a specific definition of the term is evasive. The term has as many definitions as it has plans and applications. Roemer (1965) stated that regionalization cannot be defined on the basis of experience but that agreement can be reached with regard to its objectives. The following general objectives have emerged, with a degree of agreement across applications, as central to the regionalization process:

- The efficient utilization of limited health resources
- The efficient utilization of expensive health resources
- The provision of adequate, appropriate, and accessible health services to a population
- The improvement and maintenance of standards of health services provision

The application of the concept of regionalization to healthcare provision can be traced back more than a hundred years. The event that had the broadest global impact was the United Kingdom's 1920 "Interim Report on the Future of Medical and Allied Services," commonly known as the Dawson report, after Sir Bertrand Dawson, a physician to the British royal family. The report proposed a comprehensive national organization of health services that was organized around base hospitals and integrated most services in defined regions of the country (Consultative Council on Medical and Allied Services, Great Britain 1920). The United Kingdom implemented the report's basic principles in the country's National Health Service over the course of 28 years. The Dawson report has influenced health systems in a variety of countries, particularly in Europe.

Dawson proposed dividing the country into regions that would (eventually) meet most of the preventive and curative health needs of the population. Specialized, scarce, and expensive services for a wider area (or country) would be available on referral but not duplicated at the regional level. The services of hospitals would be defined according to a classification system, thereby ensuring access to basic services while avoiding competition and underuse. The influence of Dawson's emphasis on the integration of preventive and curative resources to achieve a more effective investment balance cannot be overstated.

Hospital-centered regionalization has become a widely discussed approach to health system organization in a number of countries, particularly in Europe but also elsewhere. For instance, the Chilean National Health Service reorganization program, which started in the 1960s, created hospital areas with the understanding that a hospital would have full responsibility for the health of the population within its service area. With all health activities linked to the hospital, clinical physicians would have to be directly involved in

regionalization
A broad organizational concept with a variety of applications; its key aims include efficient use of limited and expensive health resources, the provision of accessible health services to a defined population, and the development of standards for health services provision.

the field programs, potentially leading to the effective integration of preventive and curative medicine. At the time of the program's implementation, private hospitals were not included; the director of the area was to be the director of the largest (frequently, the only) hospital in the area.

The rationalization of health-provision resources to serve a defined population—be it a country, region, district or community—is a very appealing idea. In theory, it is most likely to succeed in a central command-and-control political system, wherein one owner has control over all the components. However, that theory assumes that the full range of essential services exists or is accessible in each region. Application becomes more complicated—and potentially unrealistic—when applied to pluralistic environments with diverse financing schemes, multiple ownerships, local governments, advocacy organizations, and competing demands. Also, of course, additional complications follow from the differing political philosophies about the role of the state.

One key organizational issue focuses on how to integrate new knowledge into the capital planning process. Another issue deals with reducing the duplication of diagnostic services that can be provided electronically to many hospitals. An additional question is how to create incentives in the capital management process that will modify internal organization and **facility design** to support such changes (Edwards, Wyatt, and McKee 2004).

Kenya's pluralistic environment provides an example of how the role of the private sector can be constrained by the lack of access to capital. A substantial portion of care is provided by private for-profit and faith-based hospitals that have difficulty obtaining loans. As a result, funds are not available to start new hospitals, or to improve or replace existing facilities (Barnes et al. 2010). In Benin, banks generally loan only to large, well-established hospitals that are managed or owned by well-known doctors, and smaller enterprises are rarely considered. Capital funding limitations can also result from poor management skills, difficulties with property titles, and lack of collateral (Strengthening Health Outcomes Through the Private Sector [SHOPS] Project 2013).

Addressing these issues will require an understanding of global experience and an emphasis on the development of leadership and management competencies. The professionalization of healthcare managers will be indispensable in advancing the effective and efficient use of organizations' resources.

Organizational Planning and Design

Organizational planning and design enable managers to align the healthcare organization's functions and resources with its mission, vision, values, goals, and objectives. The planning process incorporates a variety of tools to facilitate work relations and interactions, efficient resource allocation, and effective decision making.

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facility design

The design of the space in which a business's activities take place. The planning and layout of that space have a significant impact on the flow of work, materials, and information through the system.

The challenges facing healthcare managers can be either internal or external to the organization. One of the most important internal challenges involves the increasing technical complexity of the services being provided, which stems from continually changing medical technologies and the diversity and professional autonomy of the health professionals who interact in the delivery of services. Other internal and external challenges are associated with healthcare managers' need to balance the components of the iron triangle. Balancing access and equity with efficient, cost-effective services and quality outcomes requires robust organizational design and planning, as well as flexibility to confront the dynamic conditions of the healthcare environment.

Organizational designs take as many forms as needed to address the uniqueness of a dynamic organization. The designs are usually reflected in an organizational chart that describes the relations, authority, responsibilities, and interactions of the different units and individuals. Other documents and tools—such as organizational manuals, job descriptions, policies, regulations, and legal or administrative documents—also describe the various functions, resources, and responsibilities in more detail. A number of these tools are described throughout this book. Some tools commonly used in the planning process are flowcharts, affinity diagrams, Gantt charts, and balanced scorecards. In large and complex organizations, and across countries and healthcare systems, increasingly comprehensive information systems and the application of informatics are now indispensable.

Several questions need to be answered before an appropriate organizational design can be determined. For example, how can we design an organization that responds to the pace of change and complexity of the external environment? How can we create a simple enough organization that presents clear responsibilities for all areas of the organization while responding to complex interrelations and problems that need to be solved? How can we incorporate clinicians and managers in the decision-making process? How do we create strong supporting guidelines throughout the organization while at the same time allowing some level of autonomy and empowerment for the providers and units (Baker, Narine, and Leatt 1994)?

An organizational chart can be presented in a variety of ways, and there is no clear “best” organizational design. Most organizations will use combinations of design types, most of which derive from three basic formats—functional design, divisional design, and matrix design. Functional design is the most traditional of the formats, and it is well suited to organizations that offer well-defined services or products, respond to slower environmental changes, and have clearly defined stakeholders. Divisional design works better in larger organizations with multiple product or service lines that can be grouped into larger divisions. Finally, matrix design is most appropriate for organizations that must respond to rapid changes in technology or highly dynamic or competitive

environments. A variation of the matrix design is the program design, which combines substantive areas and strong, well-differentiated programs with complex and unique requirements for performance. These design formats have been used in all types of healthcare organizations, and each includes elements that can effectively contribute to organizational success. It is relatively common for organizations to adopt hybrid models or change their organizational designs to respond to specific circumstances.

Management of Physical Resources

How do organizational processes determine the physical design and structure of healthcare organizations? This discussion will focus on two main elements. The first element involves the planning processes of healthcare units, of which a critical component is the development of a **prearchitectural medical functional program** that defines the services to be offered and the resources required. The second element involves the supplies and utilities needed by healthcare units (e.g., electric power, water, fuels, medicinal gases, telephones, internet), which can be provided by either public services or private companies. The processing and distribution of these supplies take place in the “house of machines,” which serves as the nuclear resource for the units’ function and connects the operation of all systems (e.g., electric, hydrosanitary, air conditioning, telecommunications, information technology). These activities enliven the elements and allow the optimal operation of functional units or facilities, administrative services, and support services as an integrated, efficient, and effective operation.

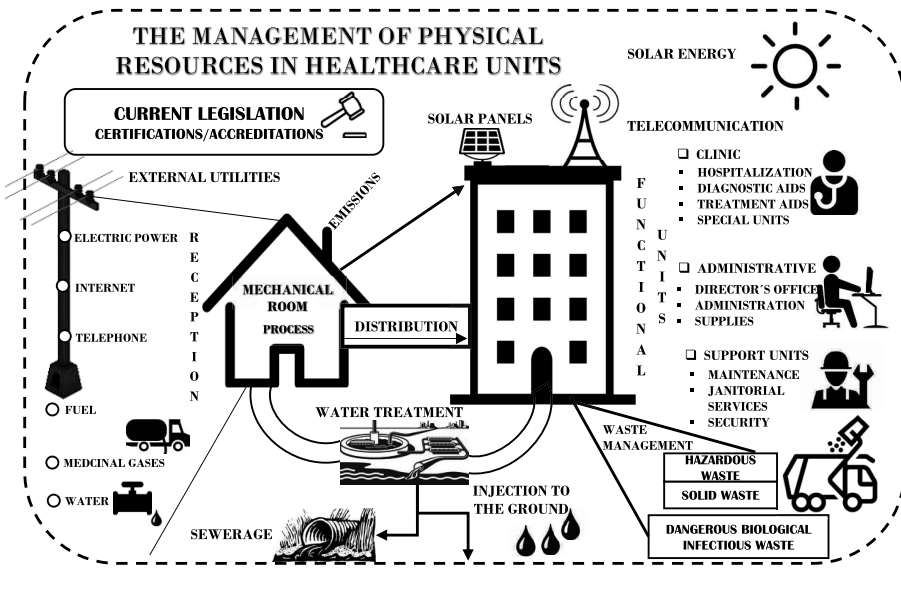
Clinical units, administrative units, and the resources of general support services that were defined in the corresponding prearchitectural medical program are distributed among the hospital buildings. Each functional unit has its own structure with respect to physical, human, material, and technological resources. The units carry out processes that transform the resources into services, the results of which are generally evaluated with indicators of quantitative and qualitative performance. Each unit receives general support services, including maintenance of architectural finishes, furniture, facilities, and equipment; cleaning and disinfection; disposal of waste; and the supply of inputs required for operation. These elements and their interrelations are illustrated in exhibit 1.2.

The construction and operation of healthcare units are strongly regulated by laws, rules, and norms of compulsory observance, typically to ensure quality, preservation of the environment, and health and safety in the workplace. The operation of the units generates liquid, solid, and gaseous waste, the management of which must be in accordance with legal provisions intended to control the pollution of air, land, and water mantles and to avoid risks to the health of patients, users, service providers, vendors, and visitors to the units. Because of safety concerns, particular interest exists with regard to proper management of

prearchitectural medical functional program

A planning document that serves as a road map for the design of a facility; it identifies functional program areas and defines such aspects as users, operational scenarios, design criteria, and square footage needed.

EXHIBIT 1.2
The
 Management
 of Physical
 Resources in
 Healthcare
 Units



equipment and substances that emit radiation and biological products capable of generating infections.

Current trends support the efficient use of energy and the use of renewable energy to promote a less costly and more environmentally friendly operation. Such trends can be seen in the use of solar panels for the heating of water and photovoltaic cells for the generation of electric power, as well as intelligent systems that control lighting and air conditioning.

Water management seeks to ensure water availability, storage, and potability, to maintain both a continuous supply and a critical reserve in case water availability is suspended, which may happen during natural disasters. Potable water is critical both for ingestion and for use in processes of care that require efficient washing of hands, surfaces, and equipment. Wastewater treatment plants can be used to recycle water and reduce consumption, leveraging water to recharge the subsoil, to water garden areas, and to use in health services.

Solid waste management is of the utmost importance. Classifications for solid waste management include organic and inorganic waste, potentially contaminated waste, and waste that requires special management because of strict regulations regarding its collection, storage, transportation, and disposal.

Health units' internal and external communication requires a complex telecommunication infrastructure, internet connectivity, and systems that allow the efficient management of voice messages and data. Such systems are particularly important for the electronic registration of various transactions and interactions necessary for the operation of the unit.

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The Planning Process

During the planning process for the construction of healthcare units, a number of elements are taken into consideration: location and geographical area of influence; the target population, with its demographic and epidemiologic profile; the types of services to be offered; and market analysis with respect to offer and demand of services both public and private.

Based on the preliminary information, a prearchitectural medical functional program is developed. This program defines the services that will be offered and any required physical spaces in accordance with the applicable regulations. A key challenge is to articulate the requirements to create functional units equipped with all the necessary resources to ensure their correct operation. At the same time, additional challenges involve making sure that the interrelations between the clinical units and the support services establish a pattern of consistent functionality and maximize efficiency to users, staff, and suppliers of goods and services. The dimensions and orientation of the land to be used for the construction will affect the number and configuration of the levels to be built, as well as the distribution of services to be provided.

The functional medical program provides the basis for the development of the architectural project, which in turn will produce functional units with appropriate furniture and equipment. Given the highly specialized and constantly evolving nature of hospital services and medical technology, this plan needs to be developed by a group of experts in hospital design, with participation of both architects and the operators of health units.

The architectural project must comply with the established framework of laws, regulations, and standards. It should keep in mind the following considerations:

- Installed capacity that responds to the needs of the target population, as well as the provision of personal clinical services
- Sufficiency of resources to achieve the goals and objectives (productivity) outlined in the business plan
- Functionality (efficiency and effectiveness) in compliance with current regulations, to ensure regular and emergency access to clinical healthcare services with comfort and security for staff, third-party suppliers, patients, and their families

Once the clinical and support units (e.g., outpatient care, emergency care, hospitalization wards, diagnostic support units, general and administrative services) and their specific capacities (e.g., numbers of offices, cubicles, operating rooms, warehouses, waiting rooms) have been defined, the final considerations for the functional plan involve determining the medical and instrumental equipment required for the operation of the various units. Decisions made at this point will depend on the financial resources available and the level of complexity expected for a particular medical facility.

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Once the prearchitectural functional program has been developed and adjusted, the executive project defines all systems, facilities, and equipment that will require supplies and utilities such as water, drainage, electric power, hydrosanitary services, air conditioning, medical gases, fuel, and telecommunications. These needs are reflected in a program with a phase-in plan that considers the stages required for construction, facilities, equipment, preoperation, and commissioning of the units in question.

The next step involves carrying out the executive project, which requires the development of the operating systems necessary for the installation and provision of the projected utilities and supplies. Project leaders should consider environmental and safety implications and ensure full compliance with regulations and standards for construction and facilities. They should also take into account the requirements that may need to be met in the future to achieve certification from accreditation agencies, such as The Joint Commission in the United States.

Execution of the project requires a project management program that elaborates required tasks, equipment and other resources, and the responsible parties. The project management program takes into consideration the span of time required for various activities and tasks, sets targets for their conclusion, and facilitates coordination between components. A variety of project management software programs are available to assist with this step. Depending on the unit's magnitude and complexity, the management of the project or supervision of work can also be contracted to a third-party company that has experience with similar units.

Of particular importance is the definition of the management model to be used to operate the healthcare unit. Selection of this model considers the strategic framework (i.e., mission, vision, values, goals, and objectives); the organizational model; the desired measures of effectiveness; the distribution of resources and work force; internal operation manuals; work regulations; rules, both internal and external; and market and/or operational plans and programs. Specific calculations need to be made for the supply and consumption of various materials, including items needed for office operations; food and medical supplies; emergency and regular maintenance materials; and tools and equipment.

Health need assessments and the steps outlined in this section can determine the amount of investment required, as well as the cost of the operation, for a unit. This information, in turn, can inform the development of a business plan to identify the feasibility and sustainability of the proposed facility or unit.

Functional Unit Requirements

The requirements for the operation of a health unit should be assessed using the management model, with attention to organizational design, the staff or personnel necessary to meet the established work shifts, job positions and descriptions, organizational procedures and manuals, rules and regulations, and necessary

inputs. Planning for the design, operation, and use of resources is influenced by such factors as the type of services provided, the medical and technological delivery capacities, the availability of resources, and the country's level of development (taking into account health expenditure as a percentage of the gross domestic product). It is also influenced by the part of the health sector in which the unit is going to operate. The public and social security sectors have well-defined models and prototypes, and most countries have specific rules for the private sector.

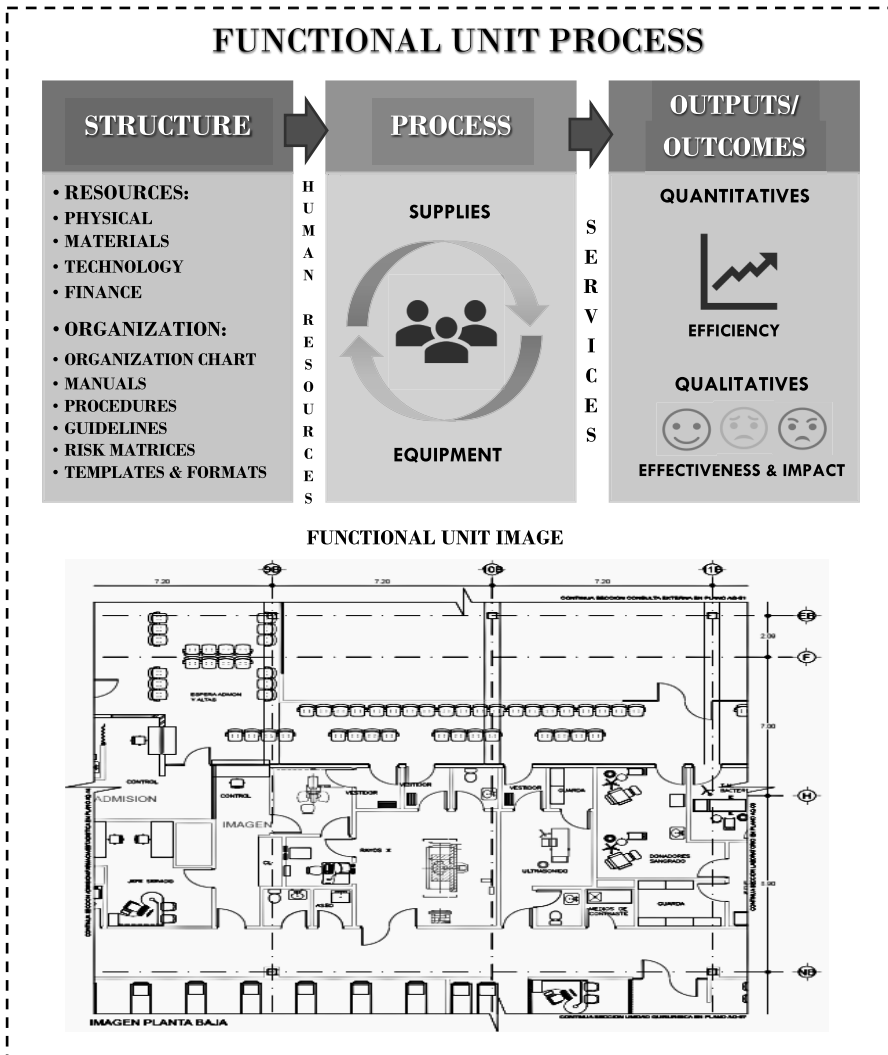
The functional units of the clinical area correspond to the provision of direct services to patients and include outpatient care, auxiliary diagnostic, auxiliary treatment, hospitalization, and specialized care units. The architectural design should consider the locations and resources required for the operation of each functional unit—incorporating both clinical services and support services—to ensure optimal access, flow, and comfort for users, providers, and suppliers. Flows should be accurately defined for the movement of users and staff, as well as for food, clean and dirty clothes, solid and potentially contaminated waste, mobile equipment, and operating supplies. The aim is to establish an infrastructure that facilitates efficient processes and stimulates productivity and satisfaction for users and staff.

Clinical services generally include the categories of outpatient services; support services, such as laboratory diagnosis and imaging; support treatment services, such as surgical and obstetric units; and hospitalization and adult special care units, such as intensive care units and burn centers. Clinical services support is given largely through nursing, which is the main pillar for patient care and an indispensable aspect for hospitalization, outpatient care, and clinical support areas. Support services—which are discussed in greater detail in the next section—include food and dietary services, cleaning and disinfection, gardening, security, waste management, and maintenance of buildings, installations, and equipment. Management services—which include senior management and middle management and supervision—are grouped by such functions as direction, quality management, management of resources (human, material, technological, and financial), public relations, and marketing.

All functional units and support services must have a management model that is documented in a procedures manual, with components dedicated to structure, processes, and expected outcomes. It should also have programs relating to quality, protection of the environment, and health and safety at work, as well as an annual operating budget and program that defines the goals, objectives, strategies, and measureable results. Each unit and service can be turned into a cost center that allows more detailed and accountable operations.

Exhibit 1.3 provides a guide for analyzing the main elements of structure, process, and outputs/outcomes that interact in the operation of a functional unit. The accompanying vignette uses an example from Brazil to illustrate some operational issues.

EXHIBIT 1.3
Functional Unit
Process



Operations Management in Brazilian Hospitals

by Ana Maria Malik

Research on private nonprofit hospitals with between 30 and 800 beds revealed that bed management in the state of São Paulo, Brazil is practically nonexistent (Raffa 2017). Although *management* is slowly becoming a

(continued)

buzzword, efficiency is not a real concern, and bed occupancy generally is not planned. Barriers to bed management initiatives include (1) problems with health information systems; (2) doctors being treated as though they “own” the beds, meaning that their approval (either formally or informally) is needed for use of the beds; and (3) a lack of discharge planning for inpatients, leading many beds to go idle. Additional information in the original Portuguese is available at http://gvsau.de.fgv.br/sites/gvsau.de.fgv.br/files/tese_claudia_raffa_21_03.pdf.

Facilities, Materials Management, and Support Services

This section will examine key issues for the effective and efficient management of buildings and facilities. It will discuss such topics as the planning, design, construction, and remodeling of facilities; housekeeping and environmental services; safety and security; issues with medical and nonmedical equipment; health technology assessment (acquisition, management, and audits); food services; purchasing, receiving, storing, distributing, processing and controlling supplies; and the future of materials management.

Facilities Conservation and Maintenance

Management of the physical infrastructure focuses on the conservation, maintenance, and operation of buildings, facilities, and equipment. The department responsible for this area represents a key structural element both for the functioning of the unit’s services and for the development of the processes that transform inputs into services. Its main objective is to ensure the good condition of the property and the maintenance of the facility and equipment, allowing for a correct and continuous operation with high levels of energy efficiency and security. The department achieves this objective through the work of trained personnel who apply both routine and preventive programs, as well as corrective actions when needed.

Effective management requires building plans that are organized by system and by architectural area, as well as an inventory of installed equipment with technical specifications, warranties, service providers, and maintenance programs. The facility must also have a stock of spare parts and supplies to use for replacement, as well as tools and equipment needed for corrective actions. Electronic devices can facilitate the registration of equipment.

The hospital operator should design and implement the necessary means to ensure the timely, permanent, efficient, effective, safe, and reliable operation of all infrastructure, facilities, general and special equipment, administrative and fixed furniture, and public services. Operations should comply with a rigorous “program of daily routines” that includes preventive, corrective, and reagent

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procedures, responding to the various particularities of each functional unit. Activities must be based on strict procedures yet also designed with flexibility to allow for technological updating, continued innovation, and responses to changes in demand that may occur over the course of the contractual term.

Public Areas Services, Maintenance, and Energy Efficiency

Key objectives of this area are to maintain optimal conditions of the facilities with regard to appearance, conservation, and functionality and to ensure the continuity and operation of all facilities, fluids, energy, systems, and equipment. Such efforts require an adequate annual program of preventive maintenance in compliance with the requirements of the present description, performance indicators, and applicable and existing legislation.

The operator should be responsible for the preventive and corrective maintenance of administrative and fixed furniture and building equipment, as well as all the facilities of the hospital or organization. Key priorities include ensuring the provision of services for the public; meeting the needs of normal, continuous, and permanent use of all areas and services of the organization; ensuring a high level of safety; and providing efficient solutions that contribute to the preservation of the environment.

Medical Gases Management and Distribution

The aim of this service is to ensure the permanent supply, conditions of use, and operation of various types of medicinal gases. Such gases are needed to assist patients and to support the operation of systems and equipment. The operator must ensure the proper management of medicinal gases through the most modern infrastructure and technology, meeting the needs of the hospital and maintaining conditions of safety and efficiency in accordance with the scale of the project. The operator must ensure the quantity, quality, continuity, and reliability of gas services with absolute respect for applicable laws. This area also must comply with the buildings', installations', and equipment requirements for accreditation and certification, as specified in the appropriate manuals, and any other terms and conditions established in contracts and their annexes. Service should also ensure the correct management of processes and subprocesses detailed in the approved operation manual.

Medical Equipment Maintenance and Supply / Health Technology Assessment

The central objective of this service is to carry out all management procedures concerning the operation, maintenance, and replacement of medical equipment and instruments. A related objective is to design and implement training and ongoing technical assistance for the correct use and operation of all of the required equipment, with specially qualified personnel for each item and task, to ensure operational excellence in all functional units. The operator should be

Health Technology Assessment in Brazilian Hospitals

by Ana Maria Malik

Research has revealed ongoing challenges with health technology assessment in Brazilian hospitals (Francisco 2017). A regulatory agency, ANVISA, was created in 2000, and a national council, CONITEC, originated in 2006 and was institutionalized in 2011. In addition, a national network for HTA, known as REBRATS, was created in 2008, and it consists of 80 health facilities, 27 of which are hospitals. A research study sampled those hospitals by region and interviewed participants of the HTA units; the interviewees largely acknowledged that their actions had not been effective. An earlier study, developed in 2011 and published in 2015, had produced similar findings: The units did not have their own budgets, their staff used time that was left over from other hospital activities, and they had no evidence that their efforts saved money or improved outcomes. In short, the hospitals did not really know what to do with their HTA units. Additional information in the original Portuguese is available at http://gvsauade.fgv.br/sites/gvsauade.fgv.br/files/dissertacao_-_fernando_de_rezende_francisco.pdf.

committed to the provision of safe, effective, and timely service, with absolute respect for the laws in force and compliance with established processes and subprocesses. Within this category of services, **health technology assessment (HTA)** represents a multidisciplinary process for evaluating social, economic, organizational, and ethical issues related to health technology. Several international resources and organizations related to the HTA function are listed at the end of this chapter. The accompanying vignette provides further illustration of key issues related to technology assessment.

Housekeeping, Janitorial, and Environmental Services

The chief objective of this area is to implement a cleaning service and manage common waste in all facilities and spaces of the hospital or organization. Adherence to established standards and safe practices allows optimum medical and nonmedical operation in terms of hygiene and aesthetics, while also reducing the risk of nosocomial infections and disease transmissions. Such efforts foster a sense of well-being among patients and personnel and project a positive image of the organization. The operator should be fully committed to the provision of a safe, effective, and timely service for common waste management and cleaning, with attention to applicable laws and the sustainability of the processes and products used.

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health technology assessment (HTA)

The systematic evaluation of health technology and its properties, effects, and impacts; a multidisciplinary process for evaluating social, economic, organizational, and ethical issues related to health technology.

Safety and Security

This service area focuses on safeguarding all functional areas of the hospital or facility and ensuring security, order, personal integrity for patients, employees, visitors, and others. Established standards should foster and contribute to a culture of security, civil protection, self-protection, and order, in which both users and assets are preserved and safe from risk. The organization should project an image of safety through compliance with contractual requirements and applicable laws.

Materials Management and Warehouses

This service deals with the acquisition, receipt, storage, custody, inventory control, and distribution of the supplies, materials, tools, and equipment needed for the operation of the hospital or facility. This service should provide for logistics and the daily functioning of the institution in conditions of safety and high quality. The operator should be responsible for managing all the inputs required for the correct performance of functional units, especially those where medical tasks are performed. The operator is also responsible for maintaining an up-to-date inventory of property, furniture, and equipment, all in optimal conditions of order, cleanliness, and safety, for each of the areas of warehouse (e.g., medical materials warehouse, equipment and furniture warehouse, discontinued items warehouse).

Pharmacy Services

The main function of pharmacy services is to procure, prepare, distribute, store, and control drugs and other curative materials. Drug and medication management is critical in the overall operation of healthcare organizations, particularly with the disproportionate increases in drug costs and the abundance of new medications available in local, country, and world markets. The management of these critical resources is subject to a wide variety of regulations and market conditions, which are mostly specific to particular countries. The operation of the medication system is affected by such factors as the way physicians prescribe and use drugs and medications; the way pharmacists prepare, dispense, and distribute drugs and medications; the administration of medications by nurses and other health professionals; the administrative processing, control, and reimbursement mechanisms established by the health organization and its departments; and applicable regulations.

Food and Nutrition Services

Nutrition is an indispensable element of good clinical outcomes in healthcare organizations. This resource-intensive area involves more than just the hygienic and efficient procurement, processing, and distribution of high-quality meals to patients and staff. It involves specialized requirements for human resources, food and supplies, equipment, furniture, and large spaces throughout the facility.

Such spaces include, but are not limited to, kitchens, offices, cafeterias, dining rooms, elevators, warehouses, and storage areas. Food and nutrition services also require thoughtful and creative controls and budgeting. Many organizations use outside catering groups to provide some or all of these services. Some aspects of food services can be revenue generating.

Summary

This chapter has discussed the essential functions and structural components of healthcare organizations, with attention to the key challenges that healthcare managers face when aligning the structure and physical resources with the organization's mission, goals, and objectives. Different types of healthcare organizations and the varied health systems around the world present continuous and dynamic challenges for managers, who must thoughtfully reshape, realign, and redesign their management of resources to achieve value-based outcomes.

Discussion Questions

1. Using the diagram in exhibit 1.1, analyze how the various elements function and interact in a particular healthcare organization with which you are familiar. Then do similar analyses of the regional healthcare system to which that organization belongs and the national healthcare system to which the region belongs.
2. Review the *Leadership Competencies for Healthcare Services Managers* framework developed by the International Hospital Federation (available at www.ihf-fih.org/resources/pdf/Leadership_Competencies_for_Healthcare_Services_Managers.pdf). Work with your immediate peers to determine which competencies you have developed and which you need to work on to improve your individual and group performance. If you wish to expand on this exercise, take the competency questionnaire at <http://healthmanagementcompetency.org/en/base>.
3. How do the five pillars to sustainability apply to your organization? Are there certain actions you can take to develop one or more of those pillars? If so, make a plan of action, and set some measureable objectives for the task.
4. What is your idea of primary healthcare? Can you design a strategy to adapt primary healthcare to one of the services or programs in your organization? If possible, work with a team of peers on this exercise.
5. Describe the type of organization used in a particular department or service area of a hospital or healthcare organization with which you

are familiar. Review the current organizational chart, consider the department's relations with other departments, and propose ways to improve.

6. Review exhibit 1.2. Compare and contrast the elements in the diagram with those of a healthcare unit with which you are familiar. Think of two areas where improvements could be made, and design a plan to address them.
7. What is the process for designing or redesigning a healthcare facility? Think of a new service or program that would require physical resources and facilities, and apply the process to that case.
8. What are the key elements to management of medical equipment and supplies? Think of a specific piece of medical equipment, and identify the key elements for ensuring a good and efficient maintenance process.
9. What is health technology assessment? Look up some HTA agencies in your country, and examine the resources they have available.
10. Interview one or two key individuals in the food and nutrition service of a hospital or healthcare organization. Ask them to identify two of the most important issues or problems they face in their service or department. Develop a plan of action to address one of those issues.

Additional Resources

Health Planning

- World Health Organization, “Sub-national and District Management: Planning and Budgeting for Services”: www.who.int/management/district/planning_budgeting/en/

Performance Improvement

- World Health Organization, “Strengthening Management Capacity”: www.who.int/management/strengthen/en/
- World Health Organization, “The Health Manager’s Website”: www.who.int/management/en/
- World Health Organization, “Management for Health Services Delivery” (examples of diverse country experiences, with documents and reports): www.who.int/management/country/en/

Health Technology Assessment

- Health Technology Assessment International (HTAi), a global scientific and professional society: www.htai.org/htai/about-htai/

- International Network of Agencies for Health Technology Assessment (INAHTA), a network of agencies in various countries: www.inahta.org
- HTA Glossary, with definitions of various HTA terms: <http://htaglossary.net/HomePage>
- World Health Organization, “Health Technology Assessment: International HTA Networks”: www.who.int/health-technology-assessment/networks/en/

Health Facilities Design and Management

- World Health Organization, “Management of Health Facilities”: www.who.int/management/facility/en/

Facilities and Materials Management

- World Health Organization, “Management of Resources and Support Systems: Drugs and Supplies”: www.who.int/management/resources/drugs/en/
- World Health Organization, “Management of Resources and Support Systems: Equipment, Vehicles and Building”: www.who.int/management/resources/equipment/en/

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