EVALUATING THE
HEALTHCARE
SYSTEM:
Effectiveness, Efficiency, and Equity

Third Edition

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Each of us feels that our understanding of the concepts of effectiveness, efficiency, and equity has been broadened and deepened in the process of writing the book. Our hope is that those who read it will be similarly rewarded.

Chapter 1

Introduction to Health Services Research and Policy Analysis

CHAPTER HIGHLIGHTS
1. Health services research produces knowledge about the performance of the healthcare system, and policy analysis applies this knowledge in defining problems and evaluating policy alternatives.
2. Effectiveness, efficiency, and equity are key criteria for evaluating healthcare systems and policies.
3. Effectiveness examines the extent to which healthcare improves the health of patients and populations, efficiency evaluates these improvements in relationship to the resources required to produce them, and equity is concerned with health disparities and the fairness and effectiveness of the procedures for addressing them.
4. Evidence suggests that the effectiveness of healthcare is either highly variable or limited, healthcare costs relative to benefits are substantial, and wide disparities in health and healthcare exist between groups in the United States and those in other countries.
5. This book presents and applies a framework for evaluating the effectiveness, efficiency, and equity of healthcare programs and policies at a variety of levels.

INTRODUCTION
“The goal of health services research is to provide information that will eventually lead to improvements in the health of the citizenry” (Nichsr 2002). This book provides guidance for applying the concepts and methods from health services research and policy analysis in assessing the effectiveness, efficiency, and equity of healthcare programs and policies in achieving this objective.
THE FIELDS OF HEALTH SERVICES RESEARCH AND POLICY ANALYSIS

Health services research produces knowledge about the performance of the healthcare system, and policy analysis applies this knowledge in defining problems and evaluating policy alternatives. This book delineates and defines the working partnership between health services research and policy analysis in assessing the performance of the U.S. healthcare system with respect to the objectives of effectiveness, efficiency, and equity, where

1. **effectiveness** examines the benefits of healthcare measured by improvements in health,
2. **efficiency** relates these health improvements to the resources required to produce them, and
3. **equity** is concerned with health disparities and the fairness and effectiveness of the procedures for addressing them.

**Effectiveness** focuses on the benefits produced by healthcare, as measured by improvements in people's health. Improvements in health include not only the sum of the individual benefits—that is, improved health-related quality of life, reduced mortality rates, increased life expectancies, and decreased prevalence of disease—but also make reference to a distribution of disease and health in a way that maximizes overall economic productivity and well-being. The clinical perspective on effectiveness assesses the contribution of medical care to improving the health of individuals, while the population perspective assesses the contribution of medical and nonmedical (e.g., environmental and behavioral) factors to the health of communities as a whole.

A second major objective of the healthcare delivery system is the drive for **efficiency**. Where healthcare is viewed as an output, the focus is on production efficiency (producing services at least cost), and where healthcare is viewed as an input in the production of health improvements, the emphasis is on allocative efficiency (maximizing health given constrained resources). Allocative efficiency depends on the relative cost and effectiveness of medical and nonmedical investments in improving health. Ultimately, maximization of health requires both production and allocative efficiency.

**Equity** is concerned with health disparities and the fairness and effectiveness of the procedures for addressing them. The ultimate test of the equity of health policy is the extent to which disparities or inequalities in health persist among subgroups of the population. Substantive equity is reflected in minimizing subgroup disparities in health. Procedural equity refers to the extent to which the structure and process, or procedures, for achieving these outcomes may be judged to be fair. The normative relevance of variations in the structure and process of care ultimately, however, can be judged empirically by the contributions of these variations to predicting inequalities in health across groups and communities.

The effectiveness, efficiency, and equity criteria provide a broader perspective, grounded in relevant theory and research, for assessing the performance of health policies and programs in achieving the overall healthcare system goals of quality, cost containment, and access, respectively. The effectiveness, efficiency, and equity criteria are often complementary. Improving healthcare effectiveness while holding resources constant increases efficiency. Increases in efficiency create opportunities for improved effectiveness and equity. However, the objectives may also be in conflict. Maximizing effectiveness by allocating additional resources to improve health may conflict with efficiency if the cost of the resources is high relative to their effectiveness. Maximizing effectiveness and efficiency by distributing resources to persons who would gain the most may be deemed unfair in terms of procedural equity if the policy leads to a very uneven distribution of these resources.

Identifying trade-offs among the three objectives that often arise in complex policy choices is an important product of health services research. Assuming effectiveness, efficiency, and equity are important policy objectives, a key question for decision makers in comparing alternatives is the degree to which one objective must be sacrificed to achieve the others.

This book will explore the common ground for integrating and applying the effectiveness, efficiency, and equity criteria in evaluating the extent to which health policies contribute to improvements in the health and well-being of patients and populations. Health services research on effectiveness provides evidence on what medical and nonmedical interventions result in the greatest health improvements. Efficiency studies compare the costs and benefits of producing these improvements given constrained resources, and equity analyses provide guidance for assessing whether both the investments and outcomes in terms of health are distributed fairly.
The chapters that follow review the conceptual, methodological, and empirical foundations for the effectiveness, efficiency, and equity objectives; show how they are applied in policy analysis; and examine the health services research questions posed in analyzing the complementarity and trade-offs between these objectives in formulating and evaluating health policy.

In this chapter, the fields of health services research and policy analysis are compared and contrasted with other types of inquiry. We present a framework for classifying topics and issues in health services research and use this framework to provide a descriptive overview of the U.S. healthcare system. Historical contributions of health services research to the development of health policy are highlighted, and selected applications in terms of current U.S. policy debates are introduced.

Health Services Research
A 1979 Institute of Medicine (IOM) panel charged with defining and evaluating the field of health services research offered the following definition of the enterprise: “Health services research is inquiry to produce knowledge about the structure, processes, or effects of personal health services” (IOM 1979, 14). A study could be classified as health services research if it dealt primarily with “personal health services” and drew upon a conceptual framework other than that of applied biomedical science, which primarily focuses on the fundamental life processes of the human organism. Personal health services were defined as transactions between providers and clients for the purpose of promoting the health of the clients. These transactions largely fall within the domain of the medical care system, in contrast to public health, which focuses on interventions to promote the health and well-being of the community or the population as a whole rather than that of particular individuals within it.

A more recent IOM (1995, 17) report that addressed how best to plan for and develop the health services research workforce offered the following revised definition of the field: “Health services research is a multidisciplinary field of inquiry, both basic and applied, that examines the use, costs, quality, accessibility, and delivery, organization, financing, and outcomes of healthcare services to increase knowledge and understanding of the structure, processes, and effects of health services for individuals and populations.” This definition differs from the former primarily in acknowledging that health services research serves to make contributions to basic, as well as applied, research in selected areas (e.g., the operation of medical care markets in health economics theory) and that it is concerned with studying a broader continuum of healthcare services, focusing on population-based as well as personal services.

A committee convened by the Academy for Health Services Research and Health Policy (now AcademyHealth) in 2000 defined health services research as “…the multidisciplinary field of scientific investigation that studies how social factors, financing systems, organizational structures and processes, health technologies, and personal behaviors affect access to healthcare, the quality and cost of healthcare, and ultimately our health and well-being. Its research domains are individuals, families, organizations, institutions, communities, and populations” (Lohr and Steinwachs 2002, 8).

This definition highlights the following advances in the field:

1. Health services research has matured as a scientific field of study through its contributions to the development and testing of theories regarding the operation and impact of healthcare markets and systems.
2. The field has expanded to encompass the examination of an array of factors (including nonmedical social factors) in influencing the health and well-being of patients and the public.
3. The revised definition acknowledges the importance of research and interventions at a variety of levels, given the growing complexity of the U.S. healthcare system.

Figure 1.1 displays the continuum of programs and services that would be incorporated in a comprehensive integrated healthcare system. The continuum implies continuity and integration over time and between components in the context of promoting and protecting the health of individuals and populations through primary prevention to inhibit the onset of health problems, secondary prevention to restore a person who is already affected to maximum functioning, and tertiary prevention to minimize the deterioration of function for those with problems that are essentially not curable. The provision of ambulatory and acute institutional care within the conventional medical care system encompasses the treatment-oriented center of the continuum.
Community social and economic programs as well as public health programs and policies define the primary prevention-oriented beginning of the continuum; and long-term institutional, home, and community-based care extend the continuum to enhancing the quality of life and maximizing the functioning of the chronically ill or disabled. The prevention-oriented and long-term care poles encompass an array of nonmedical as well as medical programs and services directed toward promoting or protecting the health of the public and individuals.

Health services research is inherently interdisciplinary in focus in that it draws on and applies theories and methods from an array of disciplines, including sociology, political science, epidemiology, demography, economics, law, and medicine, among others (Choi and Greenberg 1982; Ginzberg 1991; NICHR 2002). Basic disciplinary research is primarily concerned with the development and testing of theories to explain social or biological phenomena, while health services research applies the theories and methods that have evolved within these disciplines to investigating problems related to the operation and performance of the healthcare delivery system. Further, whereas clinical research is principally concerned with medically related services and outcomes for individual patients, health services research more broadly acknowledges the array of nonmedical (i.e., social, economic, and organizational) factors that may help to promote health or prevent illness (see Figure 1.2).

**Policy Analysis**

Policy analysis is defined in terms of two principal objectives: (1) the production of information relevant to understanding social problems and identifying policy solutions and (2) the development of reasonable arguments translating the information into recommendations for governmental action (Dunn 2003). The distinction between health services research and policy analysis is that the first objective—the production of knowledge—defines the primary contributions of health services research, and the second—the application of knowledge—represents the primary contributions of health policy analysis to governmental decision making.

The first objective most directly mirrors the goal of health services research that is concerned with generating knowledge about the need for, implementation of, and effects of specific health services programs and policies. The principal questions and issues being addressed are factual or objective: to document the origins, scope, and causes of a social condition of concern to policymakers (e.g., the proportion of the population and subgroups without insurance coverage) and project or evaluate the probable consequences of alternatives being considered for addressing it (e.g., cross-national comparisons of alternative systems of financing medical care).

The second objective extends somewhat beyond the role traditionally assumed by health services research. This objective involves synthesizing information to justify the relevance of particular types of research, to weigh existing evidence and compare trade-offs among competing objectives, and to construct a recommendation for policymakers regarding the nature and significance of a problem or the utility of a specific program or policy proposal. The primary emphasis of this objective are normative and prescriptive: to provide a logical, well-documented rationale for choosing among competing views of the adequacy of existing policies (e.g., in providing insurance coverage) or between alternative strategies (health insurance reform) to achieve competing health policy goals (effectiveness, efficiency, and equity).

These objectives assume a rational, problem-solving process of policy development that is not realistic given the complex set of institutions and political processes that determine health policy in the United States. These elements of policymaking include the attitudes, concerns, and opinions of the public at large and of special interest groups; their respective and relative ability to influence the decision-making process;
the values of elected and nonelected officials that lead the institutions and processes making these decisions; and the nature and content of competing items on the policy agenda. Health services research and policy analysis may influence policymaking by providing information and analysis of problem conditions (e.g., the limited willingness of providers to see Medicaid patients), determining the consequences of possible solutions (increased provider fees, extended medical liability coverage, or Medicaid managed care), and evaluating the pros and cons of alternative policy proposals. The political will to apply this information to the policymaking process is not always forthcoming. Attempts at national healthcare reform in the 1990s provide evidence on the uses of information and analyses to enrich as well as distort policy debates (Rushefsky and Patel 1998).

At the end of the chapters presenting the policy strategies and the evidence regarding the effectiveness, efficiency, and equity of healthcare (Chapters 3, 5, and 7), criteria for assessing problems with existing policies and evaluating alternatives from each of these perspectives will be identified and illustrated in the context of breast cancer screening and treatment. The final chapter applies these criteria in a policy analysis of mammography screening policy for older Medicare-eligible women.

**Comparisons with Other Types of Inquiry**

Figure 1.3 contrasts health services research and policy analysis with other types of basic and applied scientific inquiry in terms of the primary research objectives of each. Disciplines (e.g., economics) provide useful theories (of demand and supply) to explain biological or social phenomena (the operation of consumer and provider behavior in the medical care marketplace). These theories underlie the ways in which health services research describes and assesses the performance of the healthcare system—in terms of efficiency, for example. Health program evaluation is concerned with assessing the effect of specific policies and programs (e.g., alternative health education or clinical screening strategies to prevent cancer) on a defined policy outcome of interest (e.g., survival or quality of life) and applies the concepts and methods of health services research in evaluating these alternatives. Evaluating the implementation and effect of healthcare programs such as community-based outreach, physician education, or financial incentives to encourage preventive behavior and service use has been a major activity of health services research (Grebowski 2001; Shi 1997). To the extent that such evaluations are directed toward assessing specific governmental policies or programs, they may provide direct input to related health policy analysis efforts. Policy analysis draws on the fund of knowledge generated by disciplinary and health services research to (1) define and analyze current problems (e.g., cost, access, or effectiveness of cervical cancer screening) and (2) compare and evaluate health policy alternatives (counseling safe sex practices).

Health services research has been criticized historically for not being sufficiently involved in the conduct of research that directly informs difficult health policy decisions (Anderson 1998; Choi and Greenberg 1982; Flook and Sanazaro 1973; Ginzberg 1991; IOM 1979, 1991, 1993; Lavis et al. 2002). Compilations of the contributions of health services research to health policy and management do clearly indicate, however, that the lines between health services research and policy analysis are more aptly characterized as diffuse, rather than distinct. Health services research has been directly used in evaluating a variety of policy options, such as the cost, quality, and access implications of alternative universal health insurance proposals and of enrolling Medicaid- and Medicare-eligible individuals in managed care (Altman and Reinhart 1996; Brown 1991; DeFrieze, Ricketts, and Stein 1989; Ginzberg 1991; Shi 1997; Shortell and Reinhart 1992; White 1992).
**Figure 1.3 Comparison of Objectives of Health Services Research with Other Types of Inquiry**

<table>
<thead>
<tr>
<th>Type of Inquiry</th>
<th>Objective</th>
</tr>
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<tbody>
<tr>
<td>Disciplinary research</td>
<td>To explain biological or social phenomena</td>
</tr>
<tr>
<td>Health services research</td>
<td>To describe and assess the performance of the healthcare system</td>
</tr>
<tr>
<td>Health program evaluation</td>
<td>To evaluate the effect of health policies and programs</td>
</tr>
<tr>
<td>Health policy analysis</td>
<td>To analyze and compare alternative (1) problem definitions and (2) health policy solutions</td>
</tr>
</tbody>
</table>

**Problem analysis**

- Problem analysis: $x_1$, $x_2$, $x_3$

**Solution analysis**

- Solution analysis: $y_1$, $y_2$, $y_3$

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**A Historical Overview of Policy-Related Health Services Research**

Health services research is a relatively new field of inquiry, although its origins may be traced to the early 1900s in the United States. Selected historical contributions of health services research to the formulation of health policy are highlighted here. (For more detail, see Anderson 1991; Flook and Sanazaro 1973; IOM 1995; McCarthy and White 2000; and NICHSB 2002.)

The Flexner report, based on a comprehensive study of medical schools in the United States and Canada, was published in 1910. This report led to a major reorganization of medical education in the United States (Flexner 1910).

The Committee on the Costs of Medical Care (CCMC) was established in 1927. That prestigious 42-member committee played a major role in the design and conduct of research on the utilization and costs of care and on the inequities of access that existed among income groups. The committee published 28 reports, including a series of reports and recommendations that affected and continue to affect how medical care is organized and delivered in the United States (CCMC 1933).

In 1935–36, the Public Health Service conducted a national health survey and a business census of hospitals to provide basic data on the health and healthcare needs of the population and on the financial structure of U.S. hospitals. An outgrowth of this early research was the development of the concept of health service areas for general hospitals and health centers. In 1944, the American Hospital Association (AHA) established its Commission on Hospital Care, which provided the first complete inventory of the nation's hospitals. This and the earlier business census identified a need for more general hospital beds, especially in rural areas, which resulted in the passage of the Hill-Burton Act in 1946, authorizing a massive nationwide hospital survey and construction program.

The Commission on Chronic Illness, established in 1949 under the auspices of AHA, the American Medical Association, the American Public Health Association, and the American Public Welfare Association, carried out a number of studies dealing with the community prevalence and prevention of chronic illness, long-term care, and home care. The AHA Commission on Financing, established in 1951, attempted to address many of the issues related to the financing of hospital care (i.e., the factors affecting cost, prepayment, and financing of care for nonwage and low-income groups) that had not been dealt with directly by the 1944 AHA Commission on Hospital Care. The research carried out by these national commissions contributed to early deliberations concerning the appropriate role of the federal government in healthcare (as in President Truman's Commission on the Health Care Needs of the Nation), as well as to the development of survey research methodologies and statistical and economic analysis methodologies that were to provide the foundation for contemporary health services research.
The U.S. Department of Health, Education, and Welfare (DHEW) was established in 1953. The National Health Survey Act, which provided authorization for the major data-gathering efforts of the National Center for Health Statistics, was passed in 1956. The research conducted under the auspices of these agencies documented continuing inequities in health and healthcare for the poor and the elderly in particular—inequities identified more than 20 years earlier by the Committee on the Costs of Medical Care. The evidence of these persistent disparities provided an empirical foundation for passage of the Medicaid and Medicare legislation in 1965, which extended federally subsidized coverage to these groups.

The formalization of health services research at the federal level resulted from the creation of a National Institutes of Health Study Section on Health Services Research in 1960, formed from the merger of Public Health Research and Hospital Facilities Research Study Sections. The lead federal agency for support of formal health services research activities, the National Center for Health Services Research and Development, was established in 1968. During the intervening period, a number of other federal agencies (e.g., the Veterans Administration, Health Care Financing Administration [now Centers for Medicare & Medicaid Services], National Institute of Mental Health, and National Institute of Aging) as well as private foundations (e.g., the Robert Wood Johnson Foundation, the Commonwealth Fund, the Kaiser Family Foundation, and the Pew Foundation) assumed a greater role in supporting the design and conduct of health services research activities.

The first national meeting of the Association for Health Services Research and the Foundation for Health Services Research was held in Chicago in June 1984. In 1989, the National Center for Health Services Research received a substantial boost in funding for research on patient outcomes and medical effectiveness as a result of major outcomes research bills introduced by Congress; the agency itself was subsequently renamed the Agency for Health Care Policy and Research (AHCPR) to reflect its more policy-oriented focus. In 1999, AHCPR was reauthorized as the Agency for Healthcare Research and Quality, establishing it as the lead federal agency on quality-of-care research, with responsibility to coordinate all federal quality-improvement efforts and health services research (AHRQ 2003).

In the chapters that follow, the contributions of health services research in general as well as the contributions of specific studies in particular, such as the RAND Health Insurance Experiment and the Medical Outcomes Study, in clarifying and evaluating health policies in terms of effectiveness, efficiency, and equity will be examined.

FRAMEWORK FOR APPLYING HEALTH SERVICES RESEARCH IN EVALUATING HEALTH POLICY

Description of the Framework
A framework for applying health services research in evaluating health policy is provided in Figure 1.4. The framework is based on adaptations of the framework for classifying topics and issues in health services research introduced in the first and second editions of this book (Aday et al. 1993, 1998).

The design and conduct of health services research is often motivated by questions related to the formulation or evaluation of health policy. The access, cost, and quality dilemmas faced by governmental and private policymakers and institutions at the national, state, and local levels in providing and paying for healthcare serve as invitations to investigators to contribute to the knowledge base needed to make informed policy decisions. There is an increasing impetus as well, grounded in research on the fundamental social, economic, and environmental determinants of health, to increase investments in nonmedical programs and policies—for example, education, employment, community development—to ultimately improve population health and reduce health disparities.

The concepts and methods of health services research provide guidance for formulating and evaluating health policy by describing, analyzing, and evaluating the structure, process, and outcomes of the healthcare system associated with different policy alternatives.

Structure refers to the availability, organization, and financing of healthcare programs; the characteristics of the populations to be served by them; and the physical, social, and economic environments to which they are exposed. Process encompasses the transactions between patients and providers in the course of actual care delivery, as well as the environmental and behavioral transactions exacerbating health risks. The consequences of policies for the health and well-being of patients and the public may be viewed as the defining outcomes of health and health-related policies.

Health services research provides basic descriptive data on the organization and operation of the healthcare system, such as the number and
Figure 1.4 Framework for Applying Health Services Research in Evaluating Health Policy

- **Health Policy**: Federal, State, Local
- **Delivery System**: Availability, Organization, Financing
- **Population at Risk**: Predisposing, Enabling, Need
- **Environment**: Physical, Social, Economic
- **Realized Access**: Utilization, Satisfaction
- **Health Risks**: Environmental, Behavioral
- **Health and Well-Being**: Patients, Community
- **Effectiveness**: Clinical, Patients, Population-Community
- **Equity**: Clinical-Procedural, Population-Substantive
- **Efficiency**: Clinical-Production, Population-Allocative

**Introduction to Research and Policy Analysis**

Distribution of providers, the percentage of population uninsured, and the rates of service utilization. It also analyzes likely relationships between and among components (reflected in the arrows in Figure 1.4), examining the impact of health policy on the delivery system; on the individuals and populations affected by these initiatives; and, ultimately and most importantly, on the health of the population the delivery system was intended to serve.

The shaded boxes in Figure 1.4 represent revisions or additions to the framework introduced in the first edition of this book (Aday et al. 1993), influenced by a conceptual framework focusing on the social and individual determinants of health developed by Evans, Barer, and Marmor (1994) and extended by Roos et al. (1996). The revised framework acknowledges the important role that physical, social, and economic environments—and their associated health risks—play in producing health.

The structure, process, and outcomes of healthcare can be studied at the macro level or micro level of analysis. The macro level refers to the population perspective on the determinants of the health of communities as a whole, and the micro level represents a clinical perspective on the factors that contribute to the health of patients at the system, institution, or individual level. Health may be measured using indicators developed for measuring progress toward health goals that have been set for identified populations or patients, such as the Healthy People 2010 objectives for the U.S. population or Health Plan Employer Data Information System benchmarks for patients in participating plans.

Effectiveness, efficiency, and equity may be viewed as specific criteria for evaluating policies and practices at both the clinical and population levels with respect to whether they actually result in significant health improvements (effectiveness), are the best use of scarce resources (efficiency), and distribute benefits and costs fairly across groups (equity). Table 1.1 summarizes the definitions of effectiveness, efficiency, and equity at both the clinical and population levels. The focus at the clinical (or micro) level is on healthcare services delivery and at the population (or macro) level on population health improvements.

At the micro level, clinical effectiveness addresses the impact of medical care on health improvements for individual patients, production efficiency is concerned with the combination of inputs required to produce these services at the lowest costs given that resources are limited, and procedural equity assesses the fairness of healthcare services delivery.
At the macro level, population effectiveness addresses the role of medical and nonmedical factors in influencing the health of populations as a whole, allocative efficiency analysis attempts to identify the mix of services that produce the greatest health improvements relative to the costs of producing them given resource constraints, and substantive equity is judged ultimately by the extent to which those health benefits are shared equally across groups in the community.

Effectiveness—or the production of health benefits—is placed before efficiency and equity in the framework (Figure 1.4) to indicate the central role it plays in assessing the cost of producing health benefits (i.e., efficiency) as well as the distribution of these benefits and costs across groups (i.e., equity). The double-headed arrow between Health and Effectiveness indicates that patient and community health outcomes are direct inputs into evaluating effectiveness, and that effectiveness (at both the clinical and population levels) ultimately influences the health of patients and the community. Evidence on the effectiveness of clinical- or population-level interventions is needed to make informed judgments regarding the efficient allocation of scarce resources, as well as the types of services to which equitable access should be assured.

This framework has been adapted and applied in a variety of policy and program contexts, including the evaluation of the availability of community child health services; the health and healthcare needs of homeless populations; and the effectiveness, efficiency, and equity of behavioral healthcare services, among others (Aday and Awe 1997; Aday et al. 1999; Andersen 1995; DuPlessis, Inkelas, and Halfon 1998; Gelberg, Andersen, and Leake 2000; Halfon and Hochstein 2002; IOM 1993, 2002a).

As reflected in Table 1.1, the effectiveness, efficiency, and equity criteria may lead to differing conclusions regarding the best policy option based on these different criteria. Analyses of competing health policy alternatives would then optimally measure and evaluate each of these criteria and the trade-offs resulting when some are emphasized to the exclusion of others.

### Macro Level Versus Micro Level of Analysis Based on the Framework

Kerr White and his colleagues identified a number of denominators for characterizing the distribution of demand for medical care in their foresightful 1961 article, “The Ecology of Medical Care” (White 1997; White, Williams, and Greenberg 1961). These successive denominators included general or geographically defined populations, populations of sick persons, those consulting physicians, those admitted to community hospitals, those referred to other physicians, and those referred to university medical centers.

These respective denominators can be broadly adapted and applied in characterizing the impacts of health policy at either a macro level or micro level of analysis (Table 1.2). The community level encompasses the population in a defined area and the physical, social, and economic environment in which they reside. System level refers to the healthcare system, including resources such as money, people, physical infrastructure, and technology and “the organizations and systems or networks of organizations that transform these resources into health services and distribute them to consumers” either within a specific region or

### Table 1.1 Definitions of Effectiveness, Efficiency, and Equity Criteria

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Level of Analysis</th>
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<tbody>
<tr>
<td></td>
<td>Micro: Clinical</td>
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<tr>
<td>Effectiveness</td>
<td>Clinical effectiveness:</td>
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<tr>
<td></td>
<td>Improving the health of individual patients through medical care services</td>
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<tr>
<td>Efficiency</td>
<td>Production efficiency:</td>
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<tr>
<td></td>
<td>Combining inputs to produce services at the lowest cost</td>
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<tr>
<td>Equity</td>
<td>Procedural equity:</td>
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<tr>
<td></td>
<td>Maximizing the fairness in the distribution of services across groups</td>
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<tr>
<td></td>
<td>Allocative efficiency:</td>
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<tr>
<td></td>
<td>Combining inputs to produce maximum health improvements given available resources</td>
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<td></td>
<td>Substantive equity:</td>
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<tr>
<td></td>
<td>Minimizing the disparities in the distribution of health across groups</td>
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</table>

White, Williams, and Greenberg (1961).
for the country as a whole (Longest 2002, 54). Institution level refers to a specific organizational entity such as a hospital, clinic, or health maintenance organization. Patient level refers to the microcosm of clinical decision making and treatment.

Information from each of these levels is required to fully understand and interpret the effects of health policies and programs. Commitments to developing medical technologies or procedures to optimize individual patient outcomes may fail to consider whether, in the light of limited resources, these are the best investments to enhance the health and well-being of the population as a whole. Treatments that have been demonstrated to be efficacious at the individual patient level may not be applied similarly across institutions, or even within the same institution. System-level outcomes may be influenced by organizational and financial incentives that influence the patterns of healthcare provision. Community-level outcome studies allow exploration of the variations in care that may result from differential access to healthcare and from different styles of practice not detectable by outcomes research at the institutional or system levels alone. A focus on the role that personal lifestyle practices (e.g., smoking) and attitudes (e.g., toward regular physical activity) play in affecting individuals’ health status may not fully reveal the array of social structural and environmental factors (e.g., poverty, lead paint, toxic wastes) that may have consequential impacts on the health of populations residing in an area.

The discussion in the chapters that follow offers additional insights on the performance of the healthcare system that may be uniquely illuminated, as well as omitted, by a singular focus on any one point of view.

### International Implications of the Framework

The following discussion highlights the issues in applying the framework (Figure 1.4) and related effectiveness, efficiency, and equity criteria in evaluating health programs and policies in the international context.

#### Effectiveness

Effectiveness focuses on the benefits produced by healthcare, as measured by improvements in people’s health. However, these benefits and the related organization and delivery of care could vary considerably across regions and countries. Factors that influence this variation may

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Table 1.2: Levels of Analysis in Health Services Research

<table>
<thead>
<tr>
<th>Data Sources</th>
<th>Community</th>
<th>Environment</th>
<th>Population</th>
<th>System</th>
<th>Institution</th>
<th>Patient</th>
</tr>
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<tbody>
<tr>
<td>Census</td>
<td></td>
<td>X</td>
<td>X</td>
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<td>Public health</td>
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<td>X</td>
<td>X</td>
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<td>surveillance systems</td>
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<td>Vital statistics</td>
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<td>Area resource files</td>
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<td>Market-area inventories</td>
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<td>Surveys</td>
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<tr>
<td>Population</td>
<td></td>
<td>X</td>
<td>X</td>
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<tr>
<td>Organizations</td>
<td></td>
<td>X</td>
<td>X</td>
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1 The denominator for population-level analyses is individuals residing in a designated geographic area. The denominator for patient-level analyses is individuals who have utilized healthcare services. Data collected at one level can be aggregated to other levels of analysis in which these units are nested (e.g., patient-level data can be aggregated to the institution or system level). Patient-level data, and estimates based on aggregating them to the system or institution level, may be used as the numerator, but not the denominator, for population-level analyses.
include socioeconomics, human development, and governmental regulations and policies. Applying the example of breast cancer screening to be utilized throughout the book, a series of articles by the International Breast Cancer Screening Network (IBSN) chronicles the variations in structure, process, and outcomes of breast cancer screening programs across 23 different countries, all of which are developed nations (Ballard-Barbash et al. 1999; Klabunde et al. 2000a, 2000b). This group of studies documents that the effectiveness of these programs is shaped in part by the approach to screening delivery within a country.

In many countries there is strong organization of screening mammography without strict regulation of quality, whereas in the United States, screening occurs largely outside of an organized context but with legally based and federally imposed quality requirements. Most IBSN-participating countries have established mechanisms for ensuring the quality and effectiveness of screening mammography in population-based programs, although these mechanisms vary across countries.

Little evidence about the adoption and effectiveness of such programs in developing nations exists. The increasing incidence of breast cancer and the late stage at diagnosis of most disease in developing countries supports efforts to encourage introduction of breast cancer screening programs. However, the considerable economic burden imposed by mammography in terms of technology and skilled personnel make it difficult to apply in most developing countries at present, prompting researchers to suggest promotion of clinical breast exams as a more cost-effective alternative in these circumstances (Albert and Schulz 2003).

Therefore, while the clinical perspective of effectiveness gains more importance in developed countries (where the emphasis is on improving the monitoring of process and outcomes indicators for selected clinical conditions), the need for a population perspective of effectiveness (where issues such as health-needs assessment and provision of the continuum of healthcare services are foremost) is highlighted in developing countries.

Efficiency
Although most acute in the United States, efficiency concerns are universal, from the wealthiest to the poorest nations. Developed countries appear most concerned with macro cost control, whereas developing nations strive to allocate to areas that will achieve the greatest health benefit from their extremely limited resources (European Observatory on Health Care Systems 2002). All systems could benefit from more efficient methods of producing and delivering healthcare services. Even highly market-minimized systems in Sweden and the United Kingdom have integrated aspects of market competition. These countries have been relatively successful in controlling health spending as a proportion of gross domestic product (GDP). Their focus is, therefore, more on making their systems more responsive to consumers, but they are very cautious about the threat of market strategies to the equity of their systems. Market-maximized countries such as the United States have been less successful in achieving cost control, and they are pursuing competitive efficiency strategies to control spending as well as to rationalize the allocation of resources.

There is concern that these market-driven policies will fail to control cost and that equity will be further undermined by these policies (Cutler 2002; Reinhardt 1997). Especially in the poorest countries, the public sector may be so limited that private health sector development may be the only way to develop the capital necessary for public health sector improvement. Thus, some knowledge of the strengths and limitations of markets and market competition in healthcare may inform policies in a wide range of countries.

The limitations of healthcare markets in achieving both efficiency and equity provide an opportunity for government entities to make improvements in the allocation of healthcare resources and production of health services. Without competitive market price signals, alternative methods and information are needed to make efficient resource allocation decisions. The techniques of economic evaluation and cost-effectiveness, cost-benefit, and cost-utility analysis (described in Chapter 4 and illustrated in Chapter 9) can help guide public and private decision makers.

While these techniques can require extensive information on costs, health consequences, and how people value resources and health outcomes, they can be applied with the best available information to even the least developed countries (Marseille, Kahn, and Saba 1998). Using the economic evaluation frameworks to think through resource allocation issues, strategies can be identified that are likely to be more efficient and highlight the areas of uncertainty and where information is needed for a more complete assessment.
**Equity**

Concerns with the equity of health and healthcare serve as important drivers for the formulation and evaluation of health policies and programs in many countries. Equity of healthcare is essentially concerned with the operation and performance of the healthcare system and focuses on maximizing fairness in the distribution of services (procedural equity). Equity of health encompasses a look at the medical and nonmedical determinants of health and focuses on minimizing disparities in health across groups within a population (substantive equity). Both types of equity criteria are encompassed in the framework presented in this chapter (Figure 1.4) and are applied specifically to assessing health policies in terms of equity in Chapters 6 and 7.

Although both equity of healthcare and equity of health are universal goals of healthcare systems, their relative emphasis in designing and evaluating systems and policies differs across countries. In developed countries with large and complex healthcare systems, the bulk of the expenditures and the focus in terms of evaluating equity are often in terms of the operation and performance of the system itself. A particular equity concern, for example, is the universality of insurance coverage. As documented in this and subsequent chapters, the lack of public or private third-party coverage can have a major impact on the rates of utilization of needed preventive and treatment services. The healthcare reform debates in the United States and other countries have typically centered on methods for ensuring more universal insurance coverage. Wide variations exist across countries in the availability and means of financing care. The heart of the debate regarding healthcare reform is often related to whether more market-maximized versus market-minimized methods for the financing and delivery of services would be most effective in achieving the equity of healthcare objective (Blendon et al. 2002; Hacker 1996; Skocpol 1996).

In developing countries, the type of prevalent health problems, such as environmentally related risks, infectious diseases, and maternal and child health needs, as well as the lack of public or private resources for supporting a complex healthcare infrastructure, makes equity-of-health considerations assume great importance. Correspondingly, fundamental public health and primary care investments are of central concern in developing countries. The World Health Organization (WHO) has, through a variety of national and international programs, attempted to leverage its “Health for All” and facilitated the development of indicators and data systems for monitoring and evaluating progress toward this goal across countries. The WHO and U.S. Healthy People 2010 objectives, for example, represent efforts to assess the extent to which the equity of health goal has been achieved (Murray and Evans 2003). The discussion that follows points out the utility of the framework introduced here (Figure 1.4) for identifying and addressing issues in the operation and performance of healthcare systems across countries.

**Policy Analysis**

The World Health Organization has identified five common problems that policymakers in both developed and developing countries face in making choices to improve their health systems:

1. Confusion over the goals of health systems
2. Relatively weak and often conflicting evidence on strategies to improve health system performance
3. The lack of public or private institutions and individuals who are accountable for system outcomes
4. A societal focus on the development of new technologies with less attention on the delivery of technology
5. The increasingly technical nature of health system debates (Murray and Evans 2003, 3–5)

By fostering a common framework and set of measurement methods for health policy evaluation, the effectiveness, efficiency, and equity perspectives address many of these problems.

Policy debates in developed countries over the past two decades have remained focused on the short-run goal of cost containment, with dialog over market-based versus nonmarket-financing strategies to increase efficiency in service delivery (Begley et. al. 2002). The focus in developing countries has been on expanding public infrastructure, reducing waiting time, and introducing user fees (Murray and Evans 2003). Often lost in these debates is the connection of these intermediate goals to the ultimate goal of maintaining and improving population health. The effectiveness, efficiency, and equity perspectives offer a useful hierarchical framework for linking population health as an end goal to intermediate structure and process goals as the means for achieving it. (A hierarchical framework refers to the formal logic for identifying possible causes of a problem situation [Dunn 2003].) Thus, when applied
in policy debate, the framework can add clarity to goal identification by distinguishing intermediate goals and showing their linkage with the ultimate goal of improved health.

One reason for the relatively weak evidence of what works in the design or reform of health systems is the absence of a common framework for evaluating these systems. When studies use different definitions and measures of system structures, processes, outputs, and outcomes, it is difficult to build a consistent database. The efficiency, effectiveness, and equity perspectives provide a common framework and a similar set of measurement methods that may be used as a basis for developing an international database on what works in health systems performance over time.

The application of the combined perspectives of effectiveness, efficiency, and equity in policy evaluation requires policymakers to consider all health-related activities (healthcare, nonpersonal health services, and intersectoral programs such as water and sanitation programs) the primary purpose of which is to promote, restore, or maintain health. Thus, this framework offers a coherent set of tools that can help provide a broad and integrated context for policy accountability.

Finally, the specialized language and complex empirical methods used in health systems analysis often limits participation of nonexperts in national and international policy debates. The integrative framework reflects in the effectiveness, efficiency, and equity perspectives a commitment to making health policy research and analysis accessible to a broad population of students and practitioners in a variety of policy contexts.

**EVIDENCE AND TRENDS BASED ON THE HEALTH POLICY ANALYSIS FRAMEWORK**

As indicated by the framework (Figure 1.4), health policy has been directed at a variety of factors that may ultimately determine the health of individuals and populations. The discussion that follows provides an overview of historical and current trends with respect to each of these dimensions and the role of health policy in influencing them.

**Health Policy**

The diversity and complexity of contemporary health policy has its roots in the evolution of the role played by different levels of government—federal, state, and local—and also in the variant investments at these respective levels in public health–oriented versus medical care–oriented programs and services (Lee and Benjamin 2002).

The U.S. Constitution provides a broad foundation for the evolution of federal involvement in health through the assignment of governmental powers to promote and provide for the general welfare and to regulate commerce. The constitutional basis for state health and healthcare policy is lodged in the so-called “police powers” that permit state and local governments to limit the actions of individuals to control and abate health nuisances or risks related to communicable diseases and environmental hazards from wastes, water, and food. This translated initially into public health–oriented interventions to prevent the importation of epidemics and to assist states and localities with their periodic needs for disease control. One of the earliest federal health initiatives, the Marine Hospital Service, was established in 1798 to serve merchant seamen and to prevent the spread of epidemic diseases; it grew over time into what is now the U.S. Public Health Service. Local health boards and departments in industrialized seaport cities developed public health policies to control communicable disease and improve sanitation. State health departments were formed throughout the late 1800s and early 1900s to carry out disease control activities and to run state mental institutions and state-owned university hospitals.

With the passage of the 16th Amendment to the U.S. Constitution in 1916, which authorized the federal tax on income, the federal government in the early twentieth century was in an enhanced position to assume a larger role in both the regulation and provision of healthcare. Through federal grants in aid to the states, major investments in broader public health–oriented and medical care–oriented programs and services evolved.

The bulk of federal resources came to be devoted to the expansion of coverage for medical care and, to a lesser extent, public health–oriented programs and services. The 1935 Social Security Act established a significant federal role in funding health programs with the creation of the social security “safety net” programs for the elderly, disabled, and families with dependent children. Federal grants to states were initiated in maternal and child health, public health, and healthcare for the aged and poor. The power and influence of the federal government grew rapidly from the 1930s to the 1960s with the support of biomedical research; a nationwide program of hospital planning and construction; direct federal aid to professional schools of medical education;
and programs to protect the public in food and drug safety, environmental protection, and occupational health and safety, among others. After 1965, the federal government’s role was expanded further as a major purchaser of healthcare with the creation of the Medicaid and Medicare programs.

States, then, had served as the initial locus for programs and policies oriented to the health of the public until the federal government began to use its vast resource potential to meet changing public expectations after the Depression. State actions were soon driven by the conditions established for federal grant programs in public health and, eventually and centrally, for personal medical care services funding programs for vulnerable populations. These developments in categorical funding to address health problems have led to a patchwork of government-sponsored programs addressing specific diseases and populations. Health policy has become identified with the establishment, financing, and rule making for specific service programs at the federal level and the creation of administrative and service-delivery capacity to implement these programs at the state and local level. There has been a burgeoning commitment of public, particularly federal, resources to medical care provision and coverage and a significant, albeit substantially lesser, investment in categorical programs aimed at population or public health.

The 1980s and early 1990s featured broad-based efforts at health policy reform focused on controlling costs, increasing access and coverage, and improving healthcare performance. The comprehensive reform effort began in many states and provided the basis for the national reform proposal of the Clinton administration. With the demise of the Clinton plan in 1992–93, the comprehensive reform effort ended and more incremental strategies for reform gained center stage at both the state and national level (Lee and Benjamin 2002).

The tides of political change at the federal level in the latter part of the 1990s continued to shift more responsibility to the states for providing and paying for publicly supported medical care services—a shift that has catalyzed a corresponding reexamination of the importance and interface of public health and medical care service provision at both the federal and local levels. Furthering this reexamination has been the realization of the limited capacity of state and local public health infrastructure, originally highlighted by the iom report of 1988 but receiving much greater attention since the terrorist attacks of September 11, 2001, in the United States.

A key assumption underlying the framework and the associated approaches to measuring effectiveness, efficiency, and equity presented here (see Figure 1.4) is the importance of highlighting improvements in the health of individuals and communities as the essential and desired endpoint of health policy. The framework also assigns a greater importance to the “health” descriptor in “health policy” and to nonmedical as well as medical factors in producing this valued policy outcome.

Health and Health Risks
The Healthy People 2010 process, guided by the Office of Disease Prevention and Health Promotion, U.S. Department of Health and Human Services, established specific objectives designed to achieve the following two overarching health policy goals:

1. Increase quality and years of healthy life for all Americans.
2. Eliminate health disparities in the United States.

To help meet these goals, nearly 28 separate priority areas were identified, 10 categories of leading health indicators delineated, and quantifiable targets set for improvements in health status, risk reduction, and service delivery. These objectives encompassed combating chronic disease, improving preventive services and the quality of medical care, and enhancing health education and communication. The 2010 Healthy People agenda provides a specific set of targeted goals for individuals, organizations, and communities for promoting health and preventing disease (NCHS 2003a; Office of Disease Prevention and Health Promotion 2003).

The Healthy People 2010 goals and objectives are used in this section to document the health of the community and associated environmental and behavioral health risks outlined in our framework (Figure 1.4). The health of the community is examined in terms of the objectives designed to improve access and the quality of medical care delivered to communities. Environmental health risks are addressed by a series of health protection objectives, and behavioral risks are addressed by the preventive health objectives. As a means to benchmark progress in achieving the objectives of Healthy People 2010, evidence for 22 health indicators covered under the 10 broad categories of health indicators
will be reviewed. A similar comparison is made using breast and cervical cancer as health indicators (see Appendix 1.1).

Quality and Years of Healthy Life for All Americans

When indicators of access to healthcare are examined, 16 percent of persons under the age of 65 had no health insurance in the United States. Eighty-eight percent of the U.S. population had a specific source of ongoing primary care, and 17 percent of pregnant women received no prenatal care in the first trimester. These estimates fall short of the 2010 Healthy People objectives, which aim to provide healthcare insurance to every individual as well as increase the rates of having a specific source of ongoing primary care and receiving prenatal care in the first trimester of pregnancy to 96 percent and 90 percent, respectively.

Examining an indicator of environmental quality, we find that nearly 41 percent of the U.S. population was exposed to ozone above the Environmental Protection Agency (EPA) standards, far short of the 2010 target that no U.S. resident be exposed to ozone above the EPA standards. When indicators of responsible sexual behavior are examined, we find that only 23 percent of sexually active unmarried women age 18 to 44 years reported condom use by partners. This is substantially lower than the target of 50 percent for the year 2010. In contrast, 86 percent of adolescents in grades 9 through 12 were either not sexually active or were sexually active and used condoms in the year 2001, a figure closer to the 2010 planned target of 95 percent.

Examination of indicators related to immunization follows a similar pattern. While the percentage of children who received all necessary immunizations in 2001 is close to the estimated target rates for 2010 (74 percent versus 80 percent), substantial progress needs to be made in improving pneumococcal vaccination rates in noninstitutionalized adults age 65 years and older (54 percent in 2001 versus the target goal of 90 percent for 2010). A substantial burden due to injury and violence still exists in the United States, as evidenced by a death rate of 6.1 and 14.9 per 100,000 standard population for homicides and vehicular accident injuries in 2001, respectively. Healthy People 2010 goals are to reduce these figures to 3.0 and 9.2 per 100,000 standard population, respectively.

Mental health access is an area that remains sorely neglected, with only 23 percent of adults age 18 years and older with recognized depression receiving treatment. The goal is to increase treatment of recognized depression to cover 50 percent of the population that needs it by the year 2010. The nation is facing an alarmingly growing obesity epidemic, with nearly 15 percent of children and adolescents and 31 percent of adults who were either overweight or obese. Goals set by Healthy People 2010 expect to decrease these rates to 5 percent and 15 percent, respectively. Only 65 percent of adolescents and 32 percent of adults engaged in moderate or vigorous physical activity in the year 2001, much below the target rates of 85 percent and 50 percent set by Healthy People 2010. Nearly 21 percent of adolescents and 6 percent of adults reported recent illicit drug use. The goals here are to reduce those rates to 11 percent and 2 percent, respectively, by the year 2010. Finally, tobacco use remains rampant in spite of the widespread public health campaign against its use. Healthy People 2010 targets a 50 percent reduction in the tobacco use rates of 28 percent and 23 percent by adolescents and adults in the United States, respectively.

When indicators for breast and cervical cancer are examined, a similar pattern is observed. Some areas have seen current delivery rates fall well below target rates for Healthy People 2010. For example, only 37 percent of primary care providers counseled patients about mammograms, much below the target rate of 85 percent. Only 55 percent of primary care providers counseled patients about Pap tests, again less than the Healthy People 2010 target rate of 85 percent. In some cases, good progress toward Healthy People 2010 target rates has been made. For example, 70 percent of women age 40 years and older reported receiving a mammogram within the preceding two years in 2000 (Healthy People 2010 target rate: 70 percent), and 81 percent of women age 18 years and older received a Pap test within the preceding three years in 2000 (Healthy People 2010 target rate: 90 percent). Death rates due to breast cancer (2001 estimate: 26.6 per 100,000) and cervical cancer (2001 estimate: 2.7 per 100,000) must decrease by 14 percent and 26 percent, respectively, by the year 2010 if the goals of Healthy People 2010 are to be attained.

Health Disparities in the United States

Disparities across a variety of conditions and services exist for cross-sections of the U.S. population, including by race, gender, and age subgroups. Some of these disparities were highlighted in the previous
section, including extremely low rates of treatment for patients with diagnosed depression (23 percent) and low rates of pneumococcal vaccination for non-institutionalized older adults (54 percent), a sharp contrast with vaccination rates for children (74 percent). The major indicator of health disparities in the United States, however, continues to be race. For example, while 88 percent of whites and 81 percent of blacks or African Americans had health insurance in the year 2001, only 65 percent of Hispanics or Latinos had health insurance. Similarly, while only 36 percent of whites were exposed to ozone levels above the EPA standard, nearly 61 percent of the Hispanics or Latinos were exposed to these levels. While 58 percent of white, older, noninstitutionalized adults received the pneumococcal vaccine, only around one-third of the black or Hispanic, older, noninstitutionalized adults received the vaccine. Similarly, the death rate per 100,000 due to homicide was only 2.9 in the white population, compared to 20.9 and 7.4 per 100,000 in the black and Hispanic populations, respectively.

Childhood obesity rates for the black and Hispanic populations (22 percent and 24 percent, respectively) are also nearly double the rates in the white population (12 percent). However, several indicators are comparable across racial categories. These include responsible sexual behavior among adolescents and vehicular injury-related deaths.

We also find racial disparities in some indicators for breast and cervical cancer screening. Rates of death due to breast and cervical cancer are much higher for blacks compared to other races. The death rate per 100,000 was 35.0 in blacks compared to 26.0 and 16.2 in whites and Hispanics, respectively, for breast cancer and 4.9 in blacks compared to 2.3 and 3.4 in whites and Hispanics, respectively, for cervical cancer. While around 30 percent of the breast cancers in whites were diagnosed at a late stage, the rates were much higher for blacks and Hispanics (around 38 percent for both populations). While 72 percent of white women age 40 years and older had received a mammogram in the preceding two years, the rates were lower for black and Hispanic women (68 percent and 62 percent, respectively). The percentage of women 18 years and older who had ever had a PAP test or had one in the preceding three years was lower for Hispanic or Latino women compared to white or black women. Around half of black women were diagnosed with late-stage cervical cancer compared to around 42 to 43 percent of white and Hispanic women.

In summary, although progress has been made toward achieving a number of the health goals for the nation, most have not yet been accomplished. The discussion that follows describes the dimensions and trends of health disparities with respect to the U.S. healthcare delivery system, and subsequent chapters introduce approaches for evaluating system performance with respect to effectiveness, efficiency, and equity criteria and, ultimately, in contributing to improvements in the health of the U.S. population and minimizing disparities between groups.

Population at Risk
The population at risk may be characterized in terms of predisposing (e.g., demographics, attitudes), enabling (e.g., personal and family resources), and need (e.g., perceived and evaluated health status) characteristics. Healthcare access and health status differ according to characteristics such as race, gender, and socioeconomic status, and the differences are often substantial (see NCHS 2003b and Appendix 1.1).

The challenges presented in addressing these differences are related to (1) understanding and defining health and healthcare "disparities" and (2) determining the macro- and micro-level pathways through which these differences emerge.

Differences or variations in healthcare use or outcomes between groups are not all necessarily judged to be disparities (Carter-Pokras and Baquet 2002). The IOM (2003a, 3-4) report Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care, for example, defines "disparities in healthcare as racial or ethnic differences in the quality of healthcare that are not due to access-related factors or clinical needs, preferences, and appropriateness of intervention."

Unequal Treatment focuses on two levels in accounting for these disparities: (1) operation of healthcare systems and the legal and regulatory environment in which they function and (2) discrimination at the individual, patient-provider level. Disparities, in contrast to differences or variations, imply normative judgments regarding the equity or fairness of these differences. Chapters 6 and 7 explore criteria that could be implied in making these judgments.

A related extension and application of research on the social determinants of health is to identify the individual and societal pathways through which social factors influence health and well-being. This research focuses on two principal lines of inquiry: (1) the development
and application of ecosocial theories of disease distribution and (2) multilevel and contextual analyses of the social determinants of health. Nancy Krieger (2002, 9) has, for example, defined the concept of “embodiment” as “how we literally incorporate, biologically, the material and social world in which we live, from utero to death.” Related ecosocial theory-driven research attempts to empirically specify the pathways of exposure, susceptibility, and resistance to illness leading to the embodiment of socially defined risks and opportunities associated with gender, race, and/or socioeconomic status, for example. Fruitful methodological developments that have facilitated and extended this line of research include the application of multilevel statistical modeling of different levels of impact (individual, neighborhood, regional or political jurisdiction, etc.) (Diez-Roux 1998) and the use of community and participatory action research models to identify and implement programs that affected (in particular, socially disadvantaged) populations seem most relevant to their needs (Chambers 1997; Minkler and Wallerstein 2002).

In summary, health and healthcare disparities between groups remain substantial and show little evidence of narrowing. In addition, environmental and behavioral risks persist, and the attendant health impacts for some groups in particular are significant.

**Environment**

The physical, social, and economic environments in which individuals live and work significantly influence exposures to health-related risk factors. The physical environment directly affects the prevalence and distribution of health risks resulting from exposures to toxic hazards transmitted through the soil, water, and air (Goldfarb 2001; McKinney and Schoch 2003). Such risks, for example, have been variously blamed for the prevalence of childhood lead-paint poisoning; rising rates of childhood asthma, particularly among minority children; the high incidence of birth defects among residents along the U.S.-Mexican border; and excessive cancer prevalence and death rates along the Mississippi River valley (known as “cancer alley”), in which there is a high concentration of pollution-producing industries. Further, research on environmental justice has documented that such risks, and associated adverse health consequences, are disproportionately inflicted on low socioeconomic and minority neighborhoods because high-risk industries or toxic waste sites are often found in such areas (Brown 1990).

A large body of public health and health services research has substantiated the importance of socioeconomic factors in influencing the differential distribution of health and health risks (Aday 2001; Adler et al. 1994; Evans, Barer, and Marmor 1994; Feinstein 1993; Moss 2000; Subramanian, Belli, and Kawachi 2002; Syme and Berkman 1976). Evans, Barer, and Marmor (1994) provide a compelling synthesis and argument regarding the impact of social and economic hierarchies (e.g., occupation, education, income, race, and gender), and of individuals’ location within them, on health. Research based on animal models, as well as human populations, has consistently documented the poorer health status of those at lower, compared to higher, positions in such hierarchies. The dynamic that appears to be operating is that individuals in the lower ranks are more likely to be exposed to greater risks and associated stresses in their social and economic environment that can lead to both physiological and behavioral responses (e.g., biochemical changes and adoption of high-risk, addictive practices). Ultimately, these responses give rise to health disparities by social position. Whiteis (1997, 2000) and others (Abraham 1993; Cohen et al. 2003; Wilson 1980, 1987, 1989) have convincingly documented the role of public and corporate disinvestment in the poor and minority neighborhoods of large urban centers and the pervasive effect on the economic, social, and physical health and well-being of the people residing within them.

Detailed evidence on the impact of environmental risk factors, and particularly on the disproportionate distribution of health outcomes as a consequence, is reviewed in Chapter 7.

**Delivery System**

The discussion that follows highlights the availability, organization, and financing of the U.S. healthcare system, focusing in particular on the major changes that have taken place over the past three decades. Much of the information is based on an annual publication of the National Center for Health Statistics, *Health: United States* (NCHS 2003b).

**Availability**

In the 1960s, a worsening physician shortage was perceived to exist in the United States. In response, federal and state governments greatly expanded investment in medical schools, which resulted in a corresponding increase in the number of medical graduates. These trends
along with the growth in managed care organizations, raised subsequent concerns in the 1980s and 1990s about a burgeoning physician surplus (NCHS 1997, 239; NCHS 2003b, 294–95; Politzer et al. 1996; Reinhart 1991; Weiner 1994).

Contrary to these concerns, later reports suggest that there was no surplus of physicians in the United States (Salsberg and Forte 2002). The medical market has continued to absorb the growing number of physicians, both primary and specialty care. The aging population, increasing complexity and intensity of treatment, physicians’ work effort, and backlash against managed care led to demand keeping pace with the increasing supply of physicians in the 1990s. The policy to increase the number of primary care physicians in the 1990s may well result in subsequent shortages in several medical specialties such as geriatrics (Cooper et al. 2002).

A critical shortage of hospital nurses and nursing school faculty exists in many areas of the country. Rural areas in particular suffer from a shortage of providers in general and dentists in particular (Escarce et al. 2000; Knapp and Hardwick 2000; Seago et al. 2001).

Organization

Managed care systems. Managed care encompasses various forms of health maintenance organizations (HMOs), point-of-service plans (POS), and preferred provider organizations (PPOs). HMOs are organizations that guarantee delivery of a comprehensive prepaid benefit package to a voluntarily enrolled population through an organized system of care. POS represent HMOs that offer partial reimbursement for services that an enrollee chooses to obtain outside of the HMO network. PPOs contract to provide services at a discounted rate under conditions of utilization review that offer providers a wider network of enrolled populations, and enrolled populations a wider choice of providers, while restricting the scope or increasing the out-of-pocket costs of the benefits provided (AMA 1999; Reinhart 1999).

HMO plans and enrollment have grown since the early 1970s. HMOs have also become vigorous competitors of traditional health insurance plans in several metropolitan areas, enrolling about 26.4 percent of the U.S. population (or 76.1 million persons) in 2002 (NCHS 2003b, 339). Trends also include growth in for-profit managed care plans, such as PPOs and nontraditional HMOs that allow enrollees to select a non-HMO provider in exchange for a financial penalty. In 2001, 93 percent of Americans who received health insurance through an employer were enrolled in managed care compared to 73 percent in 1995 (Gabel et al. 2001). The most rapid growth in the 1990s was in enrollment in PPOs and POSs. Their combined enrollment of covered workers increased from 42 percent in 1996 to 70 percent in 2001. HMO enrollment declined from 31 percent to 23 percent during this same period, representing the shift to a less restrictive form of managed care.

As growth in the commercial market slowed in the early to mid-1990s, managed care plans began to compete vigorously to enroll public beneficiaries. Medicare enrollment in managed care plans was 18 percent of beneficiaries in 1999. Strong growth was projected to continue, reaching one-third of beneficiaries by 2007 (Lamphere et al. 1997), but managed care enrollment share had declined to 15 percent of the Medicare population by 2002 (MedPAC 2003). Managed care growth has remained strong in the Medicaid program, representing more than half (23.1 million) of all Medicaid beneficiaries in 2002 (CMS 2003).

Physician organizations. Of the 668,939 physicians in patient care in 2001, 76.8 percent were in office-based practice, 14 percent were in training, and 9.2 percent were full-time hospital staff. Almost half of physicians in office-based practice were in primary care specialties (AMA 2003a).

Thirty-three percent of physicians in non-institutional settings were solo practitioners in 2001 compared to about 90 percent in 1965. The average number of physicians per medical practice was 20.4 with a range from 7.8 in obstetrics/gynecology to 41.5 in radiology. Nearly all medical practices had one or more managed care contracts, and around one-third had contracts with capitation payment (AMA 1996, 2003b).

Hospitals. The hospital industry has also undergone tremendous changes during the past 40 years. These include

- the rapid advancement in medical technology,
- an expansion in outpatient services,
- a growth in multihospital systems,
- the emergence of increased competition among hospitals and between hospitals and other providers,
- increasing mergers and conversion of community nonprofit hospitals to for-profit status, and
EVALUATING THE HEALTHCARE SYSTEM

- a fundamental change in the Medicare payment system that supplies about half of the hospital revenue in the United States.

The shift, described in more detail later in this chapter, has been from a retrospective reimbursement system to a prospective payment system (PPS) based on diagnosis-related groups (DRGs) (NCHS 2003b; 299, 301-02).

The total number of community hospitals declined from 5,875 in 1975 to 4,908 in 2001, with total beds declining from 942,000 to 826,000 over the same time period (AHA 2003). The decline was accompanied by a shift toward investor-owned (for-profit) community hospitals and away from state and local government community hospitals. The former represented 13.2 percent of the community hospitals in 1975 compared to 15.4 percent of the hospitals in 2001. Not-for-profit community hospitals continue to represent the majority of hospitals and hospital beds, however (AHA 2003).

Another reaction to managed care and other cost-containment strategies has been the development of strategic alliances between hospitals. In the proprietary sector, large hospital corporations began purchasing hospitals in different markets and instituting centralized and standardized management practices to achieve greater efficiency and profits. Merger activity was especially strong in the mid-1990s with 235 deals affecting 768 hospitals. Mergers had declined to 142 in 1999 (Bellandi 2000). Not-for-profit hospitals also began affiliations with hospitals in their region of the country to establish referral patterns and share services and possibly to protect against the expansion of the proprietary chains (Luke, Begun, and Pointer 1989). This move to horizontal integration was followed by efforts to achieve vertical integration. Hospital systems and physician groups began forming organized systems of care (Shortell and Hull 1996). However, the trend toward vertical integration and tightly managed care failed to yield the expected efficiencies and was largely abandoned by hospitals, physician groups, and health plans across the nation (Lesser, Ginsburg, and Devers 2003; Robinson 2001).

Public health. The Centers for Medicare & Medicaid Services estimated that expenditures for public health activities by all levels of government in the United States were around 3 percent of total national health expenditures, or $46.4 billion in 2001 (NCHS 2003b, 309-10).

INTRODUCTION TO RESEARCH AND POLICY ANALYSIS

A 1999–2000 survey of local public health agencies (LPHAs) conducted by the National Association of County and City Health Officials (NACCHO 2001) documented that the majority (60 percent) of local public health agencies were county based. The most common programs and services provided included adult and child immunizations, communicable disease control, community assessment, community outreach and education, environmental health services, epidemiology and food surveillance, food safety, health education, restaurant inspections, and tuberculosis testing.

The occupations LPHAs usually employed include public health nurses and environmental scientists, as well as administrative/clerical staff. The average LPHA staff size in full-time equivalents (FTEs) was 67, with a median of 13 FTEs. The median annual LPHA expenditure in constant 1999 dollars was $621,100. The largest proportion of LPHA budgets came from local sources (county or city), followed by state sources. Funding streams varied by metropolitan and nonmetropolitan area location and the size of the population served. Local public health officials consistently indicated that workforce and partnerships with their local communities were their agencies’ greatest strengths, while funding was consistently mentioned as the biggest challenge.

Health departments face major additional challenges today. One is the financial vulnerability of their primary care clinics in this time of movement to managed care. Another is concern about the provision of preventive services as clients traditionally served by these public health clinics are moved into private sector medical care. The September 11, 2001, terrorist attacks in the United States subsequently placed even greater expectations and burdens on local and state health departments to develop expanded emergency response systems. A growing body of research on the social determinants of health has also served to broaden the public health mandate to develop intersectoral programs and policies to address the fundamental determinants of population health. These and other challenges are compelling health departments to reconsider their mission and the ways in which it can be accomplished.

A series of IOM reports have assayed the strengths and limitations of the U.S. public health system and suggest fruitful new directions for better achieving U.S. public health policy objectives (IOM 1988, 2002b, 2003b). The 1988 IOM report set out an assessment and vision for the future of public health in terms of the core public health functions of
assessment, policy development, and assurance and ten related essential public health services. The more recent reports importantly argue for grounding innovations in the design and implementation of public health policies and programs in an ecological model of population health, based on research on the multifactorial determinants of health, and broader intersectoral collaboration to ultimately improve the health of populations and reduce persistent health disparities.

Financing

Payment Arrangements

Until the 1980s, physicians in the United States controlled their means of payment and the amount they could charge through fee-for-service reimbursement. This led to high physician incomes relative to the average full-time employee as well as to other professionals and to healthcare delivery practices that were both inefficient and inequitable. The fee-for-service system resulted in overpayments for procedural care at the expense of visits and consultations, physicians providing identical services yet receiving very different fees, and systems of charges and reimbursement that were both difficult to understand and complex to administer (Simon and Born 1996).

A new physician payment system under Medicare, the resource-based relative value scale, was developed in the early 1980s in response to these problems (Physician Payment Review Commission [PPRC] 1991). The relative value was the sum of physician work, practice expense, and malpractice costs adjusted for geographic cost differences and converted to dollars using a conversion factor. The attempt was to develop a physician payment system that would (i) rationalize fee-for-service payments under Medicare, (2) reduce the rate of growth in physician expenditures, (3) protect access to care for Medicare enrollees, and (4) support quality care (Epstein and Blumenthal 1993).

The implementation of Medicare's prospective payment system in 1984 was the cornerstone for a corresponding movement to contain hospital costs. Under PPS, hospitals are paid a prospectively determined amount per discharge, rather than on a retrospective reasonable-cost basis. Payment varies by DRG category and is updated annually to reflect changes in a hospital input price index (McClellan 1997).

Hospital payment was sharply affected by the growth in managed care and competition in the private sector in the 1990s. Resulting develop-ments include hospitals increasingly engaging in cost cutting and mergers, forging closer relations with physicians and other providers, assuming of insurance functions, and contracting directly with employers. Driven mainly by an increase in outpatient services, spending on hospitals began increasing in 1997 and reached 12 percent growth in 2001, reclaiming the position of primary driver of healthcare spending growth (Strunk, Ginsburg, and Gabel 2002).

Expenditures and Costs

National healthcare expenditures for the complex and highly technological U.S. medical care enterprise were $1,424.5 billion in 2001 compared to $26.7 billion in 1960. For the same period, healthcare expenditures grew from $143 to $5,035 per capita and from 5.1 to 14.1 percent of the GDP (NCHS 2003b, 306).

While all national healthcare expenditures have grown, the 40-year shifts in the distribution of spending for services were mainly toward nursing home and home care. Hospitals still represent the largest sector, followed by expenditures for physician services. Although the absolute levels of expenditures increased, the relative share for drugs declined but increased again during the 1990s (NCHS 2003b, 310).

The growth in personal healthcare expenditures (i.e., in spending for the direct provision of care) increased sharply after the passage of Medicare and Medicaid in 1965 and continued a strong upward trend in the 1970s, a period of high general inflation. Growth declined initially in the 1980s in response to cost-containment measures and the decline in general inflation. However, average annual cost increases continued between 9 to 10 percent during the late 1980s and early 1990s. Growth in personal healthcare expenditures slowed in the mid-1990s but began to climb again in early 2000 (Levit, Lazenby, and Sivaramajan 1996, 121; NCHS 2003b, 308). The major factors affecting growth in personal health expenditures have been economywide inflation, medical price inflation in excess of general inflation, and the increased use and intensity of services per capita (Heffler et al. 2003).

Government and private insurers have increased their roles in financing healthcare services in the United States. Government programs covered 45 percent of the cost in 2001, almost double the proportion covered in 1960 (Levit et al. 1991, 50; Levit, Lazenby, and Sivaramajan 1996, 141; Levit et al. 2003, 162). Around 17 percent of personal health expenditures
were paid for out-of-pocket in 2001, compared to 55 percent in 1960. Private insurance, primarily including Blue Cross and Blue Shield plans, employer self-insurance, independent plans, and commercial insurance companies, covered 35 percent of the cost in 2001, compared to 21 percent in 1960. Despite the growth in government and private insurance, there were 43.6 million uninsured persons in 2002, and an equal or greater number without adequate insurance coverage (NCHS 2003b, 11; U.S. Census Bureau 2003). (Additional evidence on the uninsured will be presented in Chapter 7.)

Realized Access
Health services research has documented substantial variations by geography in the levels of medical care resources, in the rates of administering various medical diagnostic procedures, and in the rates of performing surgical operations. These variations have, however, not been correspondingly associated with variations in health outcomes. The discussion that follows focuses on this variations evidence. Descriptive information on widely used indicators of the utilization of and satisfaction with healthcare will be highlighted in Chapter 7.

Glover (1938) is credited with first reporting the phenomenon of variations in the rate of surgical procedures, specifically for tonsillectomy rates in England. Since then, a host of studies have reported findings of variations in rates for common surgical procedures within a state of the United States (Lewis 1969; Wennberg and Gittelsohn 1973), within a Canadian province (Roos 1984), within a country (McPherson et al. 1981; Wennberg, Bunker, and Barnes 1980), and between countries (Bunker 1970; McPherson et al. 1981, 1982; Vayda 1973; Wennberg, Bunker, and Barnes 1980). All of these studies have found that the rates for common surgical procedures being done can vary as much as five- and sixfold from one geographic area of a state to another and as much as two- and threefold between countries. In addition, the same has been found for the rates of various diagnostic and medical procedures within the United States (Chassin et al. 1986; Wennberg 1990). Wennberg (1990), using data from 16 university hospital or large community hospital market areas, found that the ratios of high to low varied from 2.0 for inguinal hernia repair to 3.6 for coronary artery bypass graft surgery and 19.4 for carotid endarterectomy.

Studies have also demonstrated variations in screening and treatment of breast cancer. For example, a survey study by Lucci et al. (2001) found a nearly fivefold difference between surgical oncologists in the western and central United States with regards to adopting a newer surgical technique for breast cancer (sentinel lymph node dissection [SLND]), although there were no variations in the procedures used to perform the SLND. A study by Goel, Iron, and Williams (1997) documented substantial variations by region in mammography screening rates in Ontario, Canada. The authors attributed this variability to physician referral patterns, patient uptake, and access to mammography screening.

In summary, dramatic changes are under way in the U.S. healthcare system as managed care comes to increasingly dominate the provision of and payment for medical care services. Trends in healthcare expenditures suggest that these changes may offer some promising constraints on the continued increases in healthcare costs. Nonetheless, wide variations in the patterns of providing medical care prevail across regions and delivery settings.

The chapters that follow introduce the concepts and methods for operationalizing and applying the effectiveness, efficiency, and equity criteria. In the final chapter, the relationship of health services research and policy analysis is described and illustrated in evaluating breast cancer screening policy for older women in terms of these criteria.

NOTE
1. More generally, we are concerned about allocating resources among all possible goods and services to achieve maximum social welfare (or well-being).

REFERENCES


