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# Issues in Measuring and Improving Health Care Quality

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*This issue of the Health Care Financing Review focuses on issues and advances in measuring and improving the quality of care, particularly for Medicare and Medicaid beneficiaries. Discussions of quality-related topics are especially timely, given the growing and widespread interest in improving quality in the organization, financing, and delivery of health care services. This article has several purposes. The first is to provide a brief description of some of the causes underlying the growth of the health care quality movement; the second is to provide a contextual framework for discussion of some of the overarching themes that emerge in this issue. These themes include examining conceptual issues, developing quality measures for specific sites and populations, and creating or adapting data sets for quality-measurement purposes.*

## HEALTH CARE QUALITY MOVEMENT

Quality has been a topic of attention in American health care since the early years of this century (Donabedian, 1989). Although quality has not been neglected in the intervening years, the focus on quality is a fairly recent phenomenon, beginning in the late 1980s (O'Leary and Walker, 1994). Since then, quality has become a front-and-center issue for providers, payers, and patients.

A number of converging influences account for the accelerated rise of the quality movement in health care today.

These include the growth and transfer of quality theories and practices from the industrial sector, concerns about rising health care costs, and changes in the health care industry.

## Transfer From Industry

One of the largest influences on the current environment is the growth of quality-management programs, which began to diffuse after World War II in the industrial sector (Laffel and Blumenthal, 1989). During the 1980s, the focus on quality spread beyond the shop floor to the upper echelons of management in manufacturing and white collar businesses (Gehani, 1993). The quality focus is pervasive in all sectors of the economy and is not expected to die out as such previous management "fads" as zero-based budgeting and management by objective. For example, the number of applications for the prestigious Malcolm Baldrige National Quality Award, the winning of which is considered to exemplify the epitome of companywide quality, have more than tripled in recent years. Applications are received from firms in all sectors of the economy, including health care (Gehani, 1993). According to Juran (1993), the 21st century will be the "Century of Quality." It will embody better ways of defining, measuring, and improving the quality of health care.

Quality as it is practiced today in industry and other settings is an amalgamation of theories and practices set forth by a number of individuals. Many of the terms related to quality are used interchangeably, and the lines between distinct theories and

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practices have blurred (Reeves and Bednar, 1994). In fact, most organizations in the private and public sectors have instituted quality programs based on the teachings of several quality champions (Anderson, Rungtusanatham, and Schroeder, 1994).

It is beyond the scope of this article to compare the work of those who made significant contributions to the quality field. However, a brief overview of the main proponents is provided because various elements have been transferred to the areas of health care organization, financing, and delivery.

W. Edwards Deming (1986) organized his management philosophy around 14 principles. These included management commitment and leadership, statistical process control, continuous improvement of processes, and removal of barriers to employee participation and control of their own quality. Feigenbaum (1963) originated the concept of total quality control and emphasized that quality should be central to all aspects of the organization, from planning to production to marketing. Juran (1964) emphasized planning and product design, quality audits, and orienting quality management toward both suppliers and customers.

Crosby (1984) focused on cultural change and calculating quality costs. He emphasized the savings which can accrue from quality programs that prevent rework, elimination of waste resulting from manufacturing errors, and inspection and testing of defective goods. Crosby believed the savings generated from quality programs outweigh their costs, thus making quality inherently "free."

Ishikawa (1985) stressed training and quality as cost-control mechanisms. He also popularized use of the cause-and-effect or fish-bone diagram, a tool to help systematically identify the roots of quality-related problems. Taguchi and Clausing (1990) extended some extant practices and

principles to include the development of customer-based specifications in product creation and provision. Benchmarking against organizations recognized as leaders was popularized by such quality champions as Camp (1989).

As many have noted, the doctrines and terms set forth by the various quality champions are confusing. Out of this thicket of names, terms, and methods, some core principles of quality have emerged; I believe the two most predominant in health care are measurement and process engineering. They are directly related to other core concepts, including striving for continuous improvement, fulfilling customer needs, changing corporate cultures, providing feedback to internal and external customers, and basing quality programs on data and industry best practices (adapted from Snell and Dean, 1992).

These quality principles, practices, and tools from corporate America have spread rapidly in recent years to the health care sector. The timing was right because of accompanying concerns about health care costs and changes in the health care industry (Lansky, Butler, and Waller, 1993). In truth, these issues were not new in and of themselves and had been addressed rather unsuccessfully by various cost-containment and management strategies (Institute of Medicine, 1990; Todd, 1993). However, the successes of the quality movement in industry—and the development of infrastructure and measurement tools—held promise to deal successfully with problems in health care (Laffel and Blumenthal, 1989).

## Health Care Costs

Concerns about the growth of health care costs and rising utilization also spurred interest in quality as a means of controlling spending growth and improving service (O'Leary and Walker, 1994).

Today, health care accounts for about 14 percent of the gross domestic product (GDP); much of that is paid for by government sources, primarily Medicare and Medicaid (Levit et al., 1994). The article by Burner and Waldo (1995) in this issue suggests that overall health care spending growth may be slowing somewhat, but still keeps the United States on its long-term trajectory of devoting increasing shares of the Nation's output to health care. In addition, the rising number of uninsured, the rapid acceleration of government health spending, and the sheer economic force of the health care sector have stimulated an interest in quality as a way to control costs and increase access to care (Teisberg, Porter, and Brown, 1994).

Employers, providers, governments, and consumers are becoming more vocal about their opposition to paying more for health care, facing restricted access to care, or receiving less appropriate care. Public payers in particular are insistent on the quality and accountability of the services they finance (Lansky, Butler, and Waller, 1993). This has brought quality concepts to the forefront of health care, in terms of ensuring value for the dollar spent and customer satisfaction, suggesting the relationship between quality and system efficiency.

### **Changes in the Health Industry**

Dynamic changes in the health care industry also have contributed to the rise of the health care quality movement. Continued mergers, consolidation of health plans, and growth of managed-care arrangements have created a highly competitive environment. In order to compete and survive, health plans must provide high-quality, low-cost care (Furse et al., 1994).

At the same time, the changes in health care markets, providers, and sites of care

also present other kinds of quality issues. For example, rapid emergence of new health care markets creates opportunities for entrance of entities, including payers, with limited skills or firms that are too overextended in startup phases to provide appropriate, high-quality care (Teisberg, Porter, and Brown, 1994).

As a result, accurate quality-assessment and consumer-satisfaction measures are needed to identify the high-quality providers and prevent the emergence of inefficient or marginal actors. That is why, for example, the Federal Government requires internal quality-assurance programs for risk health maintenance organizations providing care to Medicare beneficiaries (Armstead, Elstein, and Gorman, 1995).

Quality concerns are also behind the recent rise of consumer report cards by magazines such as *Health Pages*; by health plans and industry groups, including the Group Health Association of America (a trade association for the managed-care industry); and by employers, including the State of Minnesota and Xerox. These developments are discussed by Gold and Wooldridge (1995). Consumer report cards are becoming popular because publicly available information on the quality of care will allow consumers to select high-quality plans. Competition will drive out poor-quality providers (Gold and Wooldridge, 1995), and at the same time, the availability of quality-related information will pressure providers to improve medical outcomes and reduce costs (Teisberg, Porter, and Brown, 1994).

Concurrently, there is increased pressure by the public and policymakers to address system inefficiencies. Well-known examples include the provision of unnecessary care, incurring high administrative costs, failure to deliver preventive services, and the practice of defensive medicine (Schwartz and Mendelson, 1994; Blendon et al., 1994).

Many health care administrators and policy-makers view quality programs and measures as ways of dealing with these problems. As mentioned previously, the lessons learned from industrial quality programs are expected to translate into cost savings and system efficiencies. For example, reducing the number of reporting forms and related bureaucracies could reduce transaction costs and high administrative costs (Teisberg, Porter, and Brown, 1994).

As a result, many hospitals have formal processes, such as quality-assurance programs and annual professional reviews, focused on quality improvement (Gombeski et al., 1992). HCFA's Health Care Quality Improvement Program (HCQIP) also seeks to institute Continuous Quality Improvement in care delivery (Gagel, 1995).

### **Health Care Quality Today**

As a result of these and other factors, more and more providers are employing formal quality measures to improve care and service. For example, a recent national survey of hospital quality-improvement activities showed that more than two-thirds of hospitals have undertaken a "Continuous Quality Improvement/Total Quality Management" effort to improve the quality of care (Mahlen, 1993).

A number of Federal and State government agencies also are developing and implementing quality programs (Carr and Littman, 1990). Many of these activities stem from government's multifaceted roles of providing, financing, and ensuring care. Inherent in these roles are the notions that government is a major purchaser of care and, as such, has moral and fiscal obligations to ensure the provision of high-quality care (Vladeck, 1995).

At the Federal level, HCFA has emerged in recent years as one of the leaders in health care quality, a major purchaser, a

quality innovator, and a quality-change agent. Some of these innovations resulting from HCFA programs and funding are described in this issue.

Gagel (1995) reports on HCFA's HCQIP, which is an evolving strategy for quality management and improvement in a number of areas. These include internal HCFA operations, changes in HCFA's survey and certification activities, and reorienting the agency's peer review organization (PRO) program. These activities are focused on improvements in the provision of quality care and on improvements in quality measurement.

In a related article, Jencks (1995) provides a focused description of HCFA's Quality Indicator System for Medicare and Medicaid. Covered are the system's approaches to indicator development and validation and HCFA's overall progress in implementation.

Armstead, Elstein, and Gorman (1995) provide an overview of HCFA's many efforts to improve the measurement and provision of quality care to both Medicare and Medicaid beneficiaries in managed-care settings. Against this backdrop of quality activities in the public and private sectors, there are many issues related to quality measurement and improvement.

## **CONCEPTUAL ISSUES**

### **Defining Quality**

Quality cannot be measured if it cannot be defined. Unfortunately, there is no single definition of quality in the management, marketing, and health care fields (Reeves and Bednar, 1994). Even in the literature of these areas, the concept of quality has had multiple definitions that are used to describe a wide variety of phenomena. A study conducted by the Institute of Medicine (IOM) (Lohr, 1990) found more

than 100 definitions of (or sets of parameters to consider in defining) the quality of care. However, there is growing consensus among health services researchers on the use of the IOM's quality definition, which states that: "Quality of care is the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge" (Lohr, 1990).

This definition has appeal because it is broad enough to encompass several traditional quality-measurement domains and emerging domains. These include access to care, processes of care, outcomes of care, appropriateness, and consumer satisfaction (Jencks, 1995).

There also is no single nomenclature for quality measurement. Many researchers, including Shaughnessy and colleagues (1994), indicated that certain terms, such as "outcomes," "indicators," and "measures," have multiple meanings in the literature. The lack of a uniform definition of quality has implications for providing information to patients, providers, and payers about the costs and quality of care, as well as about satisfaction with care. How can consumers judge quality among plans if the components under consideration are defined and measured differently by the competing entities? How are consumers to know? For example, different quality definitions can yield non-comparable results that appear comparable, such as with satisfaction. Plans also can select measures in which they excel.

Additional work is needed to further refine and clarify the nomenclature of quality. In this vein, Shaughnessy and colleagues (1995) suggest two taxonomies for defining outcomes and outcome measures. One classifies outcomes and outcome measures according to the directness with which they reflect health status change related to the purpose of care. The second classifies out-

comes and outcome measures according to the care interval to which the measures pertain.

Continued inquiry and research about quality and quality-related issues must address definitional differences and must consider their strengths and weaknesses in terms of generalizability, measurement, and utility by providers, patients, and purchasers (Reeves and Bednar, 1994).

### **Process Versus Outcome Measures**

Measuring the quality of care has traditionally relied on the structure-process-outcome framework developed by Donabedian (1980). In this paradigm, "structure" refers to the characteristics of the resources in the health care delivery system, including the attributes of professionals (such as age and specialty) and of facilities (such as location, ownership, and patient loads). "Process" encompasses what is done to and for the patient and can include practice guidelines as well as aspects of how patients seek and obtain care. "Outcomes" are the end results of care. They include the health status, functional status, mental status, and general well-being of patients and populations.

Although Donabedian's model is useful, there is considerable crossover between quality definition and quality measurement within and among the model components. Jencks (1995), Zimmerman and colleagues (1995), and Shaughnessy and colleagues (1995) point out the difficulties in distinguishing between process and outcome measures. For example, dissatisfaction with care may prohibit patients from obtaining it, which is a process measure. Conversely, it may be considered an outcome measure: Is a patient's pregnancy status a process or outcome measure in situations involving in vitro fertilization?

Jencks (1995) and Shaughnessy and colleagues (1995) also note the controversy

surrounding the relative merits of process versus outcome measures. These authors suggest that process and outcome measures each have strengths and weaknesses, which come into play depending on their ultimate use as tools for management and research. For example, certain kinds of management decisions cannot wait for outcomes that take months or years to develop or are significantly affected by prior care. On the other hand, patient outcomes are an important indicator of performance and can be used to examine processes of care.

Shaughnessy and colleagues also suggest that sometimes blends of outcome, process, and structural measures can be beneficial, such as for certain kinds of program evaluations and in the overall context of quality improvement.

Future research will also need to develop and refine outcome measures that take into account consumer preferences and quality of life. This is an important consideration for many conditions for which there is no consensus on treatment modalities, such as early-stage prostate cancer, or for which patient preference now strongly guides treatment or non-treatment, such as with acquired immunodeficiency syndrome (AIDS).

New process and outcome measures will also be needed to address emerging care settings, such as rehabilitation hospitals, birthing centers, and outpatient care settings. This is especially important because such settings are being marketed to consumers on the basis of quality-related outcomes.

## **DEVELOPING QUALITY MEASURES**

### **Satisfaction**

The field of consumer satisfaction is evolving rapidly, in large part to help facilitate consumer choice among health plans

(Gold and Wooldridge, 1995). In addition, consumer satisfaction is viewed as an important measure of quality and of plan performance. Work is also proceeding on developing satisfaction measures and integrating them into satisfaction surveys and feedback mechanisms.

### ***Satisfaction Measures***

There is a fairly large health services research literature on consumer satisfaction with managed care, which was summarized recently by Miller and Luft (1994). They found that perceptions of satisfaction vary for different aspects of care.

It is important to note that many current satisfaction measures really are patients' perceptions of satisfaction, which may not accurately reflect the quality of the care they receive or their feelings about it. For example, patients' satisfaction is linked with their general expectations about care (Gilbert, Lumpkin, and Dant, 1992) or their previous experiences with the health care system (John, 1994). As a result, patient satisfaction can be measured on what is observed: a facility's environmental aesthetics; the availability of high-tech equipment; the array of services; a physician's comforting bedside manner; or a facility's amenities, including good food and accessibility to public transportation (Teisberg, Porter, and Brown, 1994).

Providers, researchers, and patients are also struggling with ways to measure patient satisfaction with the technical quality of care. Research in this area has to address two issues. One is that satisfaction measures generally assess patient perceptions of the technical quality of care they did or did not receive and may not reflect the reality of their care. A second matter is the inability of most consumers to judge the technical quality of their care, which is a "black box" for many people. As Ross and

colleagues (1987) aptly noted, a satisfied patient is not always a healthy patient, and vice versa.

Key research issues include the development of ways to bridge consumer expectations and the reality of their care and their experiences. Good comparative information and meaningful measures are essential. As emphasized in other articles in this issue, satisfaction measures are also needed that deal with the complexities of health care delivery for specific populations and in a range of care settings.

### ***Satisfaction Surveys***

Surveys are increasingly being used as tools for measuring consumer satisfaction and plan performance to provide feedback to patients, providers, employers, and insurers. Surveys typically focus on measures of plan performance, including access and use of preventive services; membership and utilization measures, such as plan demographics and usage; and financial measures. Gold and Wooldridge (1995) provide a comprehensive overview of the use of consumer surveys to address these issues in managed-care plans and traditional indemnity plans.

Gold and Wooldridge also discuss the nature and use of consumer surveys for generating information on satisfaction with individual plans and how such information is used. For example, data generated by consumer-satisfaction surveys are used by plans for marketing purposes as well as for quality assurance. Such surveys are used by external parties to address public accountability and oversight.

The Medicare Current Beneficiary Survey (MCBS) is an example. The MCBS is a continuous personal interview survey of a representative sample of Medicare beneficiaries used by HCFA to assess the use and costs of care of

Medicare beneficiaries as well as their insurance status. The MCBS also includes measures of satisfaction, which are described by Adler (1995). Using MCBS data, he finds that most Medicare beneficiaries are very satisfied overall with their medical care, although satisfaction levels varied among specific elements of care. That conclusion also holds true when assessing satisfaction according to various sociodemographic breakdowns, such as age, educational status, insurance coverage, functional status, and income.

### ***Specific Measures for Care Settings and Populations Served***

A major focus in health care quality is to develop quality measures appropriate to the processes and outcomes of care provided in various settings and for specific population groups. This is of particular interest to the Medicare and Medicaid programs because beneficiaries are increasingly receiving care in non-traditional settings. These beneficiaries are also distinctly different in terms of sociodemographic characteristics and health care needs from populations served traditionally by the commercial sector.

### ***Managed Care***

Managed-care settings have provided the backdrop for much work on quality process and outcomes measurement. Armstead, Elstein, and Gorman (1995) describe a range of such studies for both Medicare and Medicaid managed-care plans. They stress the importance of developing valid, reliable measures for managed-care plans, as well as those for the populations served. An example is expanding core measures of a quality measurement framework for commercial managed-care plans to include prenatal care

and a series of well-child preventive care measures.<sup>1</sup> These are important for Medicaid populations, which tend to have different sociodemographic characteristics than those enrolled in commercial-sector managed-care plans.

Gold and Felt (1995) focus on specific approaches to monitor and improve the quality of care in Medicaid through the Quality Assurance Reform Initiative (QARI). Its core is a series of specific criteria and guidelines for Medicaid managed-care plans to use in designing their internal quality-assurance programs. The authors note, however, the need for a set of clinical indicators that can apply to both Medicaid and commercial populations.

### ***Nursing Homes***

Zimmerman and colleagues (1995) describe the development and testing of three kinds of quality indicators (QIs) for nursing home care. The majority are outcome measures related to patients' clinical conditions. Although the indicators broadly cover the major clinical areas of nursing home care, they cannot directly address other kinds of QIs sought by consumers, such as those related to quality of life. The authors add that future research will be needed to develop other kinds of quality measures and integrate them with current QIs to create an overall measure of quality in nursing homes.

Shaughnessy and colleagues (1995) present findings from a portion of their evaluation of the Teaching Nursing Home Program, which was sponsored by HCFA and the Robert Wood Johnson Foundation. Results emphasize the need to develop meaningful outcome measures

for vulnerable populations in the range of long-term care facilities.

### ***Dialysis Centers***

Patients with end stage renal disease are among the sickest and most-costly-to-treat Medicare patients. McClellan and colleagues (1995) describe how QIs were developed for treatment of anemia, delivery of adequate dialysis, nutritional status, and blood pressure control for adult hemodialysis patients receiving treatment in hemodialysis centers. In a test of the indicators on a nationally representative sample of patients, significant variations were found in the provision of care across facilities and geographic areas. This study underscores the need to develop clinically valid and reliable measures for specific populations and conditions.

### ***Home and Community-Based Settings for AIDS***

The amount of care received at home is growing rapidly for Medicare and Medicaid beneficiaries (Clauser, 1994). Cowart and Mitchell (1995) describe the quality of and satisfaction with home and community-based services provided to AIDS patients in Florida under a Medicaid waiver. This article is among the first to examine this topic for a growing special-needs population whose care now is covered mainly by Medicaid (Health Care Financing Administration, 1995).

Results showed that AIDS patients in Florida were satisfied with the range of available home and community-based services and that their care met quality standards stipulated by Federal guidelines. Additional measures of quality and satisfaction are needed for home care to address the complexity of services provided and the

<sup>1</sup>This project is an adaptation of the Health Plan Employer Data and Information Set (HEDIS). It was developed by the National Committee for Quality Assurance (1993), a national managed-care accrediting organization, to assess the care provided by commercial managed-care plans.

range of patients served by health and social service agencies, independent vendors, and families (Kane et al., 1994).

The development of such quality measures for home and community-based care is also related to the growing interest in more global, community-based quality and outcome measures. Examples include immunization rates and incidence of domestic violence and child abuse (Shortell, Grillies, and Devers, 1995).

## DATA ISSUES

Articles in this issue emphasize that quality improvement requires measurement and that measurement requires data. Behind every quality measure, there must be a data base.

### Use of Existing Data Sets

Medicare claims data are a rich source of information that can be used for quality-related research. The data offer several advantages for researchers: They are population based, relatively inexpensive to obtain, include large numbers of cases, and can be used for long-term followup.

Medicare claims data present the opportunity to explore different quality-of-care issues with existing resources. A recent publication by Weiner, Parente, and Garnick (1995) showed the utility of administrative data in monitoring care for elderly diabetics. Other examples include recent articles by McClellan and colleagues (1995) and Ellerbeck and colleagues (1995), who used administrative data as a sampling frame in their respective work on assessing the quality of care provided to Medicare beneficiaries receiving dialysis and cardiovascular care.<sup>2</sup>

<sup>2</sup>It should be noted that both studies started with administrative data but used data abstracted from medical records and hospital discharges for their final analyses.

Administrative data sets are relatively inexpensive, but their limited detail and uncertain accuracy have raised questions regarding their usefulness in quality measurement. In this issue, Fowles and colleagues (1995) report on their efforts to determine agreement between physician office records and Medicare Part B claims data. The study was based on data abstracted from ambulatory medical records for 1,927 Medicare beneficiaries, which were then compared with data in two Medicare data files. Agreement was excellent for name and gender, but poor for ZIP Code, date of birth, and death status, primarily because of missing information from the medical records.

The analysis suggests that ambulatory records cannot be considered a "gold standard" for research purposes because they too often lack complete documentation. It does, however, suggest a complementarity of existing data sets.

Also in this issue, Zimmerman and colleagues discuss the utility of using the data routinely collected by nursing homes in developing QIs. As with the Medicare administrative data, these data provide rich, accessible information on a variety of patient and facility characteristics. A major drawback, however, is that the data must be collected at several points in time. Depending on the type of data collected and the time lags involved, the strengths of relationships may be unclear between the related QIs and the quality of care provided in the facility. This has implications for data collected in the many types of sites where care is rendered, including home care, nursing homes, hospitals, ambulatory surgery centers, and even mobile surgery centers.

### Development of New Data Bases

Although existing data bases offer potential for quality research, new kinds of

data are needed. Jencks (1995) underscores the extensive variety of data underlying HCFA's HCQIP, which is also described by Gagel (1995) in this issue. Many of these data sets are adaptations or augmentations of claims and other administrative data bases. Examples include data abstracted from medical records and hospital discharges, which can help provide clinical and other kinds of detail often missing in claims data. Abstracted data can then be combined with administrative data to create new data bases, such as were used in studies by McClellan and colleagues (1995) and Ellerbeck and colleagues (1995).

Shaughnessy and colleagues (1995) additionally point out the value of building on existing data. In their overall study, the researchers started with information from patient charts. They then collected some intervention-period data from caregivers, which had much more detail on measures of functional status, physiologic status, diagnoses, and demographics. The researchers also added a longitudinal primary-care data sample to analyze process measures of care. Data on facility-level costs and characteristics were obtained from Medicare administrative data and published sources. The result was a far richer set of data for analyses than any existing data base.

There are also gaps in available data, particularly in managed-care settings. Because many managed-care plans are paid on a capitated basis, their claims data generally lack the detail found in Medicare, for example, on diagnoses, treatments, and outcomes. Many managed-care plans do not collect patient-encounter data. As noted by Armstead and colleagues (1995), HCFA is working in partnership with the managed-care industry, States, and others to define encounter-data standards for managed-care plans. At

issue are exactly what data to collect, at what point in time, and in what ways to minimize the data collection burden.

### **Related Data Issues**

The development of new data sets raises questions about comparability of data. There is enormous variation across health plans in terms of size, cost, benefit packages, sites of care, and availability of covered services (Gold and Wooldridge, 1995). Consequently, data sets can vary widely. There are no standard data elements, formats, or methods to collect quality-related data. Results may be considered proprietary and can be reported selectively (Teisberg, Porter, and Brown, 1994).

An example is in the collection and reporting of plan performance measures in "report cards." The U.S. General Accounting Office (GAO) reviewed the state of the industry in response to the proposed use of report cards by many 1994 health reform proposals. In a published report, GAO (1994) found that: (1) Experts disagree on what report cards should include; (2) report cards may be based on inaccurate, misleading, or incomplete information; (3) measures selected may not reflect quality; (4) standard formulas for calculating results have not been developed; and (5) verification of what plans report is very difficult.

Risk adjustment also is an emerging area in quality in terms of methodological development as well as in validation and testing of risk adjusters based on more clinical or survey data. Part of the problem lies in developing risk adjusters for specific populations and sites of care. It is unclear whether we can adjust for differences in patient populations sufficiently to make meaningful comparisons between institutions. This is also a data issue, because we cannot typically collect data on all risk factors that need to be taken into

consideration. These points are emphasized by Jencks (1995), Zimmerman and colleagues (1995), and Shaughnessy and colleagues (1995).

Finally, linkages are needed for quality-related data bases within and across institutions. Furse and colleagues (1994) explain that quality information must be leveraged in order for providers to document quality of care and use the information to benchmark, market, and continually improve. There are several kinds of data bases involved, including a wide range of managerial, financial, and clinical data bases.

Such linkages will also require additional work on the details. Examples are provided by Shortell and colleagues (1995) for hospitals, but they could easily be translated into other care settings. The authors suggest the need for common patient identifiers, the ability to make the data available in real time so that on-the-spot action can be taken, the development of data bases that will link providers and patients across the continuum of care, and the need to make a range of information available to quality-improvement teams so they can address quality issues.

Finally, quality information must be linked across organizations, which include Federal and State government agencies; accrediting bodies, such as the Joint Commission for the Accreditation of Health Care Organizations and the National Committee on Quality Assurance for managed-care plans; the range of health plans, associations, insurers, and employers (Jencks, 1995; Shortell, Gillies, and Devers, 1995; O'Leary and Walker, 1994; Cohen and Brand, 1993; Vibbert, 1993; Gold and Wooldridge, 1995). As mentioned previously, the lack of agreement about formats, data elements, and timing are barriers that need to be addressed.

## FUTURE DIRECTIONS

The articles in this issue emphasize development of measures that are valid and reliable within and across settings and providers. New measures must be sensitive to the unique characteristics and special health care needs of various populations. These include the chronically ill, the developmentally disabled, and the mentally ill.

Measures must also be meaningful to consumers, employers, and insurers. These issues will take on increased importance, given the current consolidations and mergers in the health care field and the trend toward the provision of care in non-traditional settings by non-traditional providers.

A key issue will be ensuring that data are collected in standard ways and that quality measurement from these data is standardized. Risk-adjustment mechanisms will be needed to address the differences in the health risks of diverse populations and in various health plans.

A final note concerns the application and translation of quality measures into practice. Patients, providers, payers, and policymakers continue to be dismayed by research that shows the continued provision of less-than-optimal care for many conditions and in a variety of care settings. This is especially disturbing, given the widespread availability of practice parameters, consensus-development conferences, and guidelines from the Federal Government, accrediting bodies, and specialty organizations (Todd, 1993; Vibbert, 1993; Leape, 1995; Nash, 1995).

The central point is that good measurement enables and compels improvement but will not produce it without related improvements in systems, whose performance must also be measured. As a result, future quality-measurement activities must include new measures of effectiveness for delivering feedback (Nash, 1995). Measures

to assess changes in organizational cultures and barriers to quality implementation will also be essential.

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