National Healthcare Quality Report

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National Healthcare Quality Report

Contents

Note: Appendixes to this report can be accessed and/or downloaded at www.qualitytools.ahrq.gov

Executive Summary

> "Better health is an individual responsibility, and it is an important national goal.We're making great progress in preventing and detecting and treating many chronic diseases, and that's good for America… We're living longer than any generation in history. Yet we can still improve. And we can do more."
>
> *President George Bush, June 2002*[1]

This first annual National Healthcare Quality Report (NHQR) echoes the President's message on the quality of health care in the Nation: We are making progress, we can improve, and we can do more.

Key Findings:

- High quality health care is not yet a universal reality.
- Opportunities for preventive care are frequently missed.
- Management of chronic diseases presents unique quality challenges.
- There is more to learn.
- Greater improvement is possible.

The Department of Health and Human Services (HHS) plays a critical role in ensuring that the American people have the safest, highest quality health care services. To that end, HHS has embarked on a multifaceted health care quality initiative. Strategies supported under this initiative include efforts to reduce medical errors with research, implementation of proven evidence-based practices, and improving reporting systems for errors and adverse events; increasing the appropriate use of effective health care services by medical providers; increasing consumer and patient use of valid, reliable health care quality information; improving consumer and patient protections; and accelerating the development and use of an electronic health information infrastructure.

High Quality Health Care Is Not Yet a Universal Reality

The observation that quality of health care in America can be improved is not new. Lack of consistent provision of the best quality care means that not all Americans benefit from the Nation's investments in biomedical science.[2]

> “As great as our health care system is, my friends, you know and I know that it can be even better.”
>
> *Tommy G. Thompson*
> *Secretary of Health and Human Services*[3]

In many areas, the report shows that the health care system is performing very well. For example:[i]

- Quality of care has markedly improved. For measures that have trend data, 20 of 57 areas have improved over time.

- The vast majority of patients are getting the care they need in many areas. For people with diabetes, most have their blood sugar and cholesterol levels checked. Most people have their blood pressure and cholesterol levels checked to help prevent or control heart disease, and 85% of people experiencing a heart attack receive aspirin upon arrival at the hospital. Women are being screened for breast cancer with mammography at rates that already reach Healthy People 2010 objectives. For child health, more than 73% of children aged 19 to 35 months have all recommended vaccinations. Seniors receive influenza immunization at very high rates.

- Health care is improving in many areas. For cancer patients, more cancers are being detected at earlier stages. As a result of investments in biomedical research, new treatment options now exist to extend the lives of individuals with cancer. For diabetic patients, there are fewer unnecessary admissions to the hospital. For maternal and child health care, the percentage of women using prenatal care in their first trimester has increased over the last 30 years. For adult asthma patients, fewer are admitted to hospitals. In nursing homes, progress has been made in reducing use of physical restraints. In patient safety, there has been significant progress in reducing infection rates in certain types of hospital intensive care units.

In other areas, improvement can be made, including:

- Thirty-seven of 57 areas with trend data presented in the report have either shown no improvement or have deteriorated.

- Despite the sophisticated diagnostic and therapeutic options now available, rates remain low for provision of some basic and cost-effective preventive care (e.g., colorectal cancer screening and checking for high cholesterol levels).

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[i] Source of data: See Measure Specifications Appendix, 2003.

- Only 23% of those with hypertension have it under control. Control of hypertension is essential to continued successes in reducing mortality from heart disease, stroke, and complications of diabetes.

- Half of the people with depression stop using their medicines within the first month, a far shorter time period than recommended by experts and scientific evidence.

- In terms of patient safety, about 1 in 5 elderly Americans is prescribed medications that may be inappropriate and thus potentially harmful.

Opportunities for Preventive Care Are Frequently Missed

Too much of medicine today focuses on treatment of illness after it occurs, rather than preventing it before it begins. At the launch of the *Steps to a Healthier US* initiative in April 2003, Secretary Thompson said the following about the importance of such preventive care:

> "Approximately 95% of the $1.4 trillion that we spend as a Nation on health goes to direct medical services, while approximately 5% is allocated to preventing disease and promoting health. This approach is equivalent to waiting for your car to break down before you take it in for maintenance. By changing the way we view our health, the Steps initiative helps move us from a disease care system to a true health care system."

While we are justly proud of the progress made in the treatment of heart attacks, cancer, diabetes, and end stage renal disease (ESRD), we neglect opportunities to stop these same diseases before they start. The report shows areas where more focus on prevention can save more lives and resources. For example, while smoking remains the single most preventable cause of mortality, rates of smoking cessation counseling of patients, both in the hospital and during office visits, are only 40% and 60%, respectively. Likewise, data on screening for high cholesterol show that 67% of adults have had their cholesterol checked within the past 2 years and can state whether it is normal or high. Screening for high cholesterol— which is also a risk factor for diabetes— can prevent the development of heart disease. The percentage of people 45 years of age and older on this same measure is more than 80%; however, the percentage for those under 45 years of age is 53%. Screening for colorectal cancer is 42.5%. Too many cancers are detected at a late stage, leading to suffering and premature death.

Management of Chronic Diseases Presents Unique Quality Challenges

Of the specific conditions covered in this report, the vast majority—cancer, chronic kidney disease (CKD), diabetes, HIV and AIDS, depression, asthma, and congestive heart failure—are chronic diseases. Some of these conditions are inextricably intertwined with one another. For example, diabetic patients have high rates of chronic kidney disease, and those with chronic kidney disease are at greater risk of developing cardiovascular problems. Tracking quality of care for chronic disease, therefore, involves examining not only individual measures of quality for these diseases, but the related measures as well. Data reported in the NHQR reinforce the challenges associated with ensuring quality preventive and curative health care for chronic conditions.

- **Diabetes.** Across the five "process" measures of care (annual retinal eye exams, annual influenza vaccinations, annual HbA1c checks, annual foot exams, and biannual lipid profiles), there is considerable variability in the delivery of services (from 54% for influenza immunization to 94% for lipid profiles). Yet, in 2000, only 20.7% of patients reported having received all five major tests in the past 1 to 2 years (depending on the standard for the test).

- **Smoking.** The relationship between smoking and a number of diseases, including cancer and heart disease, is well established.[4,5,6] Identification of smokers and counseling them to quit has been demonstrated to be both effective and cost effective.[7] National data show the potential of targeting quality improvement to where it can have the biggest impact on chronic diseases. Data on routine office visits show that in 2000, only 62% of smokers reported that their doctors had advised them to quit. However, less than half of acute heart attack patients who smoke report receiving counseling to quit while in the hospital (42%). Advice to quit smoking to hospitalized patients with acute heart attack is associated with a 50% quit rate at 1 year, compared with a 1 year quit rate of 8% in ambulatory settings.

- **Chronic Kidney Disease.** The large number of people with CKD is partly attributable to an increase in the rates of diabetes (especially type 2 diabetes) and hypertension.[8] Forty percent of all CKD patients have diabetes, and 26% suffer from hypertension.[9,10] The growing number of people with these two diseases is partially due to lifestyle factors, such as obesity and lack of exercise. That said, data on in-center hemodialysis patients show that nearly 90% are receiving adequate dialysis.

There Is More To Learn

There is no one national survey tracking quality of health care in America. Rather, the report relies on a variety of existing national data sources to present and report quality information. Because of data and measures availability, this first quality report is uneven in its coverage of the areas selected for reporting. While measures for a number of areas have been thoroughly tested, widely accepted, and implemented by providers, in other areas this is not the case. For example, there are agreed upon and commonly used measures to track quality of care performance for treating heart attacks, diabetes, respiratory disease, and ESRD. However, not all conditions tracked in the report have such developed, broadly accepted, and widely used measures (e.g., mental illness, HIV/AIDS, early stage chronic kidney disease). For several conditions, measures are currently being developed; for others, consensus among experts on a core set of measures is not imminent. Finally, even when there is widespread support for core measures, the national data needed for reporting oftentimes are not yet in place. The reasons for this unevenness are as follows:

- **Meeting the criteria for measure selection.** Criteria for selection of quality measures include clinical importance, scientific soundness, and feasibility; all measurement and reporting efforts must strike a balance among the tensions inherent in meeting all three. Whenever possible, measures presented in this report use assessments of performance that are consistent with current science and supported by professional consensus.

- **Rapid advances in knowledge.** Part of this unevenness in measure development is due to the rapid change in certain fields. As knowledge of optimal detection and treatment improves, quality measures must be updated to reflect the most current scientific knowledge.

- **Limitations and advances in information technology.** Limitations in the availability of data constrain the ability to track certain conditions. Data can come from several different sources: medical charts, patient surveys, facility surveys, vital statistics, surveillance systems, and administrative and claims records. The degree to which data are collected from any of these sources varies widely. Expected gains in information technology, including the adoption of electronic medical records, will directly address this dearth of data by providing one data source without imposing any additional burden of collection on providers. Such gains in quality of care have been seen in large systems such as the Veterans Health Administration following the implementation of an electronic medical records system and efforts to track and use quality of care data coming from those medical records.[11] The Department of Health and Human Services is making a substantial investment and providing leadership for the development of a national health information infrastructure. For example, on July 1, 2003, Secretary Thompson announced that a standardized medical vocabulary system (SNOMED, developed by the College of American Pathologists) would be made available free of charge to all health care providers. This will facilitate the sharing of electronic information.

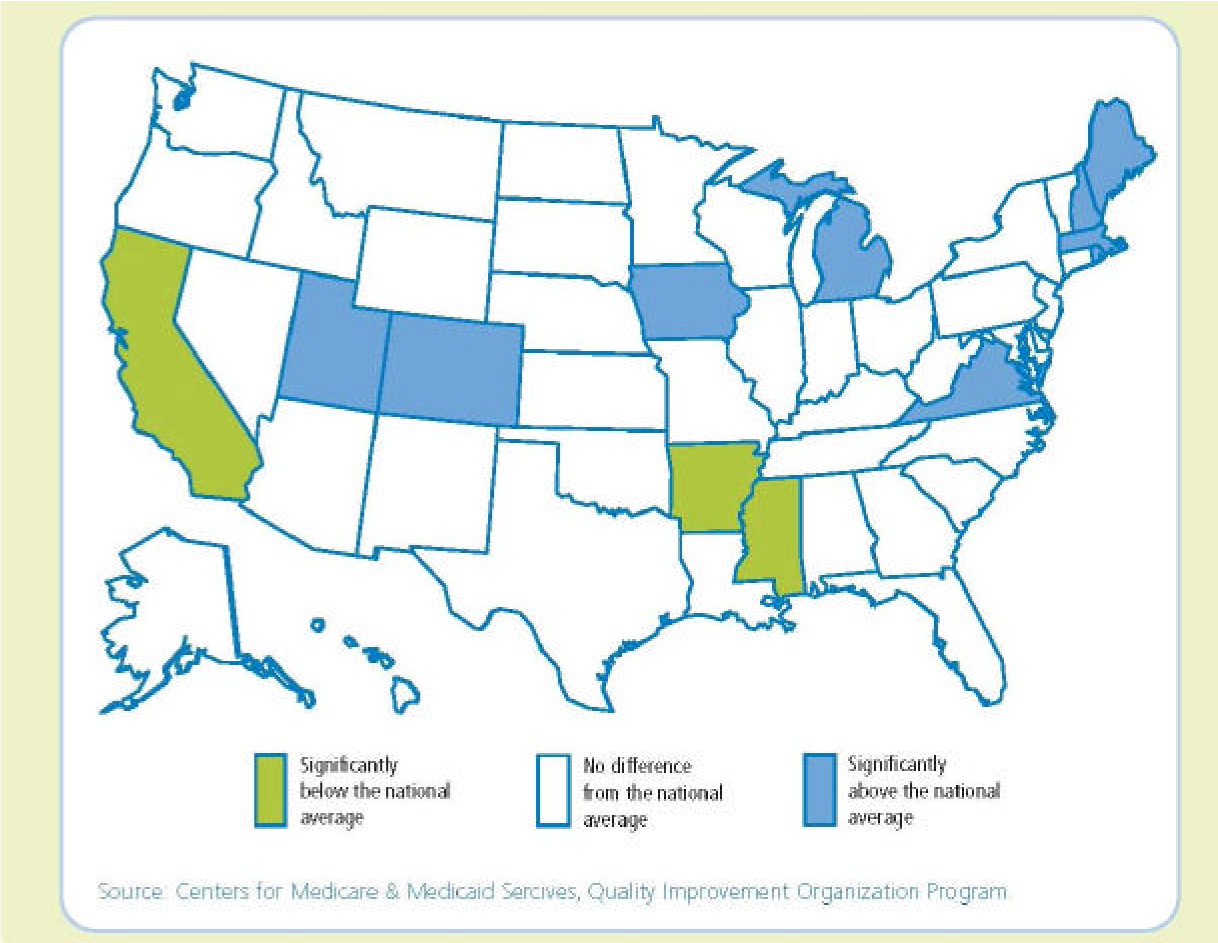
Greater Improvement Is Possible

Improvement comes about not through mandates, but rather through innovation that is led by "champions" with the vision to customize improvements to local circumstances. Many provider organizations offer quality health care. They strive to achieve the best health care practices as described by experts in the field. While the reasons for superior performance are complex, high scores are often achieved because a group of providers and other stakeholders have identified a quality problem and committed resources and personnel to fix it. In the process, they may discover something that works, which in turn can be learned and adopted by others.

One approach the NHQR focuses on is the variation across States or regions that may indicate the possibility for cross-learning (see Figure 1).

Improvement is possible in health care quality. Data reported in the NHQR's Heart Disease section show how the Nation fares in prescribing beta-blockers for heart attack patients when they leave the hospital. Chosen as a national priority for improvement by the Medicare Quality Improvement Organization (QIO) program, the national rate rose to 79%. Moreover, this performance is up from 21% of eligible patients in the early 1990s.[12] In addition, improvement on this measure has been relatively universal. Fully 45 States are at or above 70% on this measure.

Figure 1. State variation in percentage of heart attack patients prescribed a beta-blocker at discharge



Source: Centers for Medicare & Medicaid Services, Quality Improvement Organization Program

The report also presents examples of how efforts to improve quality in the measurement areas covered in the report have achieved results. For example, the Assistant Secretary for Health has recently showcased some outstanding examples of best practices in States across the Nation, many of which correspond to the priority areas of this report. These interventions include:

- A program to encourage greater organ donation in a county in North Carolina (relevant to the low level of transplants for chronic kidney disease patients).

- A successful suicide prevention program instituted by the U.S. Air Force (pertinent to the mental illness section of this report, in which one of the measures is mortality from suicide).

- An initiative in Massachusetts to lower the smoking rate (related to the measures in the report on smoking cessation counseling).

- A Michigan project to provide better prevention, detection, and treatment of diabetes.[ii]

Additional inspiring best practices show us how to provide cost-effective, high quality care. For example, the SSM Health Care system sponsored by the Franciscan Sisters of Mary and based in St. Louis, MO, was recently awarded the Malcolm Baldrige Award for excellence in quality of care. SSM simultaneously exceeded national performance goals, strengthened its bottom line, and empowered its employees.[13] Similarly, the National Committee on Quality Assurance, which accredits managed care plans, produced *Quality Profiles: In Pursuit of Excellence in Managed Care,* a publication containing more than 38 examples of exemplary practices and designed to help plans "fine tune their own quality improvement (QI) efforts."[14] These are only some of the excellent examples of programs that are making greater improvement possible.

This is the first of what will be an annual report on the state of health care quality in the United States. As such, there is much that can be improved upon in future reports. The annual nature of the report not only will allow for updating and improving the report, but will also provide ongoing information on a core set of quality measures. The primary role of the report is to provide the data and information that can tell us how the Nation's health care system is performing in terms of quality of care. The hope is that this information will be used to help focus efforts to change health care quality for the better. In this way, the report, as an ongoing tracking tool, will provide the foundation for the translation of research and evidence into action and practice.

[ii] Established by Congress in 1987 to enhance the competitiveness of U.S. organizations, the Malcolm Baldrige National Quality Award is given to organizations in manufacturing, service, small business, education and health care that have exemplary achievements and can serve as a model and inspiration to others (NIST News Release, 2003).

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Chapter 1. Introduction

> "Our nation is the leader in health care innovation and discovery. It's critical that we share these triumphs so that all Americans benefit from improvements in modern medicine."
>
> *Senator Bill Frist (R-TN)*
> *November 4, 1999*[i]

In its reauthorization legislation, Congress directed the Agency for Healthcare Research and Quality (AHRQ) to produce an annual report on health care quality in the United States (Section 913(b)(2) of the Public Health Service Act as added by Public Law 106-129). The National Healthcare Quality Report (NHQR) was designed and produced by AHRQ, with support from the Department of Health and Human Services (HHS) and private-sector partners, to respond to this legislative mandate.

This is the first national report by HHS on health care quality in America. The purpose of the report is to summarize the current state of the science of health care quality in terms that are understandable and relevant to a broad audience, including providers, consumers, researchers, and policymakers. This is the first national report to examine not only how effective health care is, but also how patient-centered, timely, and safe health care is in America. The report is built on a 3-year effort to identify appropriate measures with extensive input and agreement from stakeholders. The goal of this first edition is to provide a baseline view of the quality of health care in America; future editions of this report will help the Nation make improvements by tracking quality through a constantly evolving, science-based set of measures.

Why Do We Need the NHQR?

The mandate for the report grew out of a confluence of activities, including a growing body of research and a series of reports from the Institute of Medicine (IOM) highlighting the quality challenges facing the Nation and the interest and commitment of the new Administration to improving health care quality.[1,2,3] In his first appearance before Congress as Secretary of HHS, Tommy G. Thompson told the House Budget Committee, "The department's goal must be to build a healthier America by improving the quality of health care, the quality of life for all Americans and reduce health care costs." (U.S. House of Representatives Committee on the Budget, March 7, 2001)

The report is a resource that can help make sense out of this information by encouraging consensus-building on what is important to address and how to measure it, and then to synthesize and summarize it in one document. This distilling of the data that really matter and sorting out the data that may be redundant mean that the report can serve as a policy-level information

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[i] From a statement made regarding passage of the bill mandating the National Healthcare Quality Report.

management tool and as a vehicle to rationalize what is needed relative to the burden on providers and provider organizations.

What We Mean By Quality of Care

Simply stated, "Quality health care means doing the right thing at the right time in the right way for the right person and having the best results possible."[4] Quality health care means striking the right balance in the provision of health services by avoiding overuse (e.g., getting unnecessary tests), underuse (e.g., not being screened for high blood pressure), or misuse (e.g., being prescribed drugs that have dangerous interactions).[5]

Within the past 20 years, the health care system began to adopt the methods of quality improvement used in business and industry, particularly the use of data to assess performance. Businesses that employed such methods were able to successfully translate data and information into improvement in their products and bottom lines, producing higher quality for the same or less money. The broad use of data to track performance in health care came about for several reasons. One was a demand for value by purchasers because of rapidly increasing health care costs for purchasers and the Nation as a whole. By the early 1990s, health care accounted for 14% of the Gross Domestic Product, up from only 8.8% two decades earlier. In addition, the growth of managed care and the data processing developments provided the means to effectively and efficiently carry out performance measurement for large populations. These developments combined to move health care from an industry driven by anecdote to one driven by data. Purchasers and the Government demanded that the health system be held accountable and that performance be reported.

The quality of health care can be measured, monitored, and improved over time. By specifying clearly, based on current science, which services should be provided to patients who have or are at risk for certain conditions and finding out whether those services are being correctly provided at the right time, we can track the performance of our medical care system. Experts in a field can propose a measure of performance, then test, adopt, and implement it. For example, we know that it is important to check whether a person's blood pressure is high because untreated high blood pressure can cause heart disease. One measure used in this report is the percentage of people over 18 years of age who know whether their blood pressure is normal or high. By using the information collected in the National Health Interview Survey (NHIS),[ii] which asks people over 18 if they know whether their blood pressure is high, we can determine whether people are, in fact, getting their blood pressure checked and, furthermore, which are good candidates for medical intervention. Doctor's notes of patient visits and individual medical records can also be used to determine whether a patient received the necessary medical care. For example, when a patient is admitted to a hospital for a heart attack, the medical record will reflect whether he or she received the recommended beta-blocker therapy within 24 hours of admission.

[ii] The National Health Interview Survey is a nationally representative household survey conducted continuously since 1957 by the National Center for Health Statistics, Centers for Disease Control and Prevention.

Process and Outcomes Measures

Current efforts rely on a mix of process measures (i.e., was a certain service or procedure provided, like a foot exam for a person with diabetes) and outcomes (What was the result of the service? Did the patient avoid hospitalization? Live longer than patients who did not receive the service?). In general, process measures are viewed as being under the direct control of the health care system and, therefore, a fair measure of its performance, whereas outcomes can be affected by a variety of factors other than the medical care received (someone can die not of the heart disease for which they received treatment, but from another cause). However, because outcomes represent the results of health care treatment, patients and stakeholders are often more interested in these than in process measures. The Institute of Medicine, in its guidance to AHRQ on the development of the measures set for the report, advised that the report should include both process and outcome measures.

Data Source Issues

Data in this report come from many sources, including consumer surveys, reviews of medical records, administrative and claims data, and vital statistics. The different data sources provide different perspectives and give a more complete picture of the quality of care for each specific condition. For example, data from medical records provide the physician's report of what procedures were performed in the medical encounter; and, while patient reported data can supplement the medical records with the experience of the encounter, this may or may not be helpful for diagnoses.

Significant data enhancements are expected with the diffusion of information technology; an electronic medical record, for example, eliminates many errors that might occur from abstraction of paper records or reliance on administrative data collected for billing and not quality of care purposes. In addition, use of health information technology will also provide the opportunity for more timely feedback on performance than is now possible.

Purpose and Goals of the NHQR

This report is not a report on the latest research findings about quality of care. Instead, the report explicitly relies on existing measures. The report is built on measures focusing on the Nation's health care priorities as determined by associated morbidity, mortality, and opportunity for improvement. Also, the report tracks selected conditions using measures for which national data are available. It does not directly address facility or individual practitioner performance, consumer choice, or provider accountability.

The primary purpose for the compilation of this report is to present the current state of health care quality for the Nation as a whole. By doing so, the report brings disparate sources of data together—and builds on the best efforts of the public and private sectors—to form a coherent story that will advance our knowledge of health care quality nationally. This knowledge is the first step along a continuum that will lead to improved health care. A secondary goal of the report, therefore, is to highlight appropriate best practices from the public and private sectors relevant to the areas tracked in the report. The listings of opportunities for improvement and best practices are not exhaustive, and future reports will expand upon this presentation of best practices.

The report is intended as a tool for Federal and State policymakers, and therefore it tracks quality at the national and, wherever possible, the State level. The report is not intended as a prescription for how to fix the American health care system. Instead, it is intended as a tool for understanding the level of performance of the health care system across a broad spectrum of quality measures. By tracking a core set of measures over time, the report will begin to build consistent measures of success that will inform local improvement efforts. This first report is the foundation upon which we will build future annual health care quality reports to Congress. At the same time, through public and private input, the report will be revised annually.

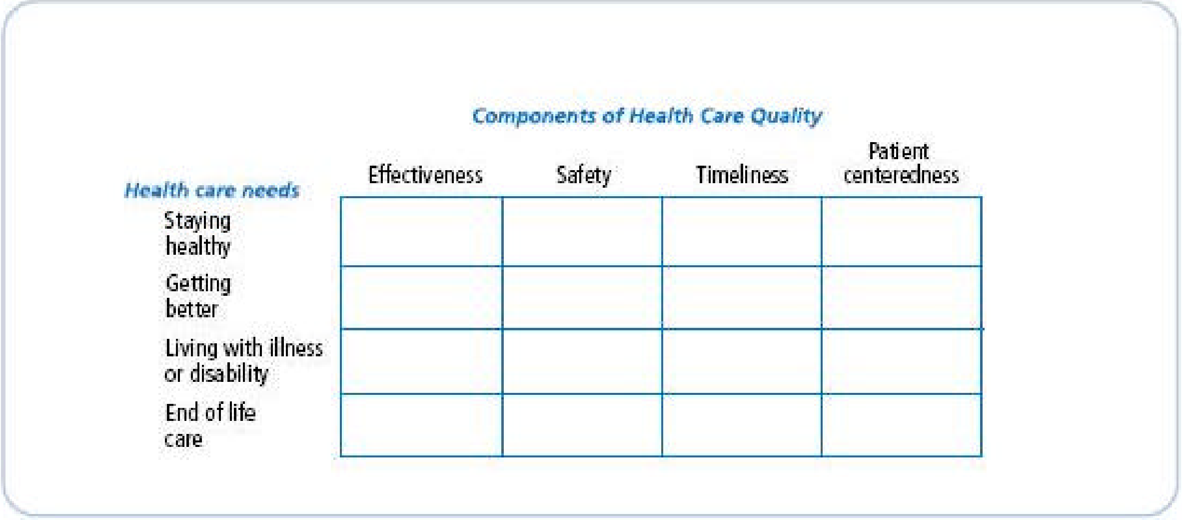
Finally, in addition to tracking our improvements in health care quality over time, we also expect the report to reflect improved uses of information technology (IT) and more precise measures that incorporate the most recent scientific advances. Improvements in IT that make data more accessible will facilitate the use of data in monitoring process and outcomes of care by allowing data to be retrieved from one source without taxing an already overburdened health care system. We discuss some of these potential areas f or improvement in the report within this first edition. We look forward to feedback on this first report to help shape subsequent editions.

How the NHQR Was Created and Organized

On behalf of HHS, AHRQ has received ongoing input from numerous agencies and offices within the Department in an Interagency Workgroup formed to provide advice on the design of the report. The final measure set is the result of 3 years of development activities that began with the creation of a conceptual framework and ended with a set of measures that has been used as the basis for the first report.

The congressional mandate to produce the report did not specify the dimensions of quality and which conditions should be included in the report. As a first step, AHRQ contracted with the Institute of Medicine to create a conceptual framework for the report. The conceptual framework (Figure 1) is a matrix including components of health care quality (e.g., effectiveness, safety, timeliness, patient centeredness, equity) and patient needs (e.g., staying healthy, getting better, living with illness or disability, coping with the end of life).

Figure 1. National Healthcare Quality Report Framework



Components of Health Care Quality

Health care needs	Effectiveness	Safety	Timeliness	Patient centeredness
Staying healthy				
Getting better				
Living with illness or disability				
End of life care				

In the *Envisioning the National Health Care Quality Report*, the IOM advised AHRQ to examine quality across different subpopulations within each of the major areas of the framework (effectiveness, safety, timeliness, and patient centeredness). In this way, the dimension of equity would be tracked in each of the "cells" of the report's framework. Issues of equity will be explored in depth in a companion report, the National Healthcare Disparities Report (NHDR), which shares the same quality measures as this report.

An Interagency Workgroup populated the framework with priority conditions and with quality measures for those conditions. We have instead used *Healthy People 2010* as the basis for the priority conditions tracked here.[iii]

The process for selecting and adopting the measures took 3 years to complete and involved participation from every agency in the Department. It also involved considerable private-sector input through a public hearing on the report by the National Committee on Vital and Health Statistics (NCVHS). At the hearing, the American Medical Association, American Hospital Association, Joint Commission on Accreditation of Healthcare Organizations, Midwest Business Group on Health, and National Association of Health Data Organizations testified on the measure set, offering suggestions and encouraging our adoption of the measure set. The process for generating the measure set also involved extensive input from providers, hospitals, and researchers through a *Federal Register* request for public comment between August 19, 2002 and September 18, 2002 (67 F.R. 53801, August 19, 2002). The measure set has been vetted with the IOM committees involved in providing guidance to AHRQ on the design of both the quality and disparity reports. Finally, the measure set was ratified by the two interagency workgroups for the two reports with membership from every agency in the Department. The measure set was then reviewed and ratified by AHRQ senior leadership.

[iii] The IOM prepared recommendations to HHS for a set of priority conditions entitled, *Priority Areas for National Action: Transforming Health Care Quality*. This document was prepared concurrently with the first NHQR and was, therefore, unavailable for use in this report.

How to Read This Report

The NHQR consists of the report itself and appendixes[iv] to the report, as follows:

- **National Healthcare Quality Report.** Main body of the report summarizing the findings across the report's quality of care framework.
- **Tables Appendix.** Detailed tables for each measure in the measure set.
- **Measure Specifications Appendix.** Specifications for all of the measures and data sources contained in the measure set.

The report is divided into chapters according to the components of health care quality. We have attempted to summarize the key findings in each chapter. Rather than discuss the results of each measure, we focus on the key findings across the measures for each area of the report. Within each section, the report presents five main topics related to that section:

- Background and impact (e.g., effectiveness of cancer care).
- How the NHQR measures quality of care on this topic.
- How the Nation is doing on this topic.
- What we don't know about quality measurement on this topic.
- What can be done based on some selected best practices and promising research.

The report also contains these additional sections designed to help readers interpret our findings quickly and easily:

- **Executive Summary.** Synthesis of main themes and findings on health care quality in America.
- **Methods.** Major methodological steps taken in analysis and synthesis of data for the first quality report.
- **Conclusion.** Summary of main themes and description of the way forward following the publication of the report.

For readers interested in replicating the analyses conducted for this report, there is additional information preceding the Tables Appendix on how statistical testing for the detailed tables was conducted.

[iv] To access and/or download the appendixes, go to www.qualitytools.ahrq.gov. Readers should note that a Measures Background Appendix providing detailed information and rationale for inclusion of measures in the measure set is currently in development and will be available online at a later date.

References

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Chapter 2. Methods

This chapter briefly summarizes some key issues related to the organization of the quality report and methods used to construct the measure set, conduct relevant data analysis, and report conclusions.

Selection of Measures and Data Sources

Formal input was received through an Interagency Workgroup and a presentation to the HHS Data Council. Representatives from a range of HHS agencies provided ongoing input throughout the development process of the first quality report through this temporary work group. Future reports may rely on a similar group to provide input as the measure set evolves. The NHQR Interagency Group includes representation from:

- Assistant Secretary for Planning and Evaluation (ASPE)
- Centers for Disease Control and Prevention (CDC)
- CDC-National Center for Health Statistics (NCHS)
- Centers for Medicare & Medicaid Services (CMS)
- Food and Drug Administration (FDA)
- Health Resources and Services Administration (HRSA)
- Indian Health Service (IHS)
- National Institutes of Health (NIH)
- Substance Abuse and Mental Health Services Administration (SAMHSA)

In order to select measures for the report, a subgroup was drawn from the above group—the NHQR Measures Workgroup—which included representatives from AHRQ, the National Center for Health Statistics, the Centers for Medicare & Medicaid Services, the National Institutes of Health, and the Office of the Assistant Secretary for Planning and Evaluation. This workgroup developed a “call for measures” that was sent to all relevant Federal agencies. The Institute of Medicine issued a complementary call for measures to the private sector. Those submitting measures also had to submit the name of a proposed data set. More than 600 measures were submitted for consideration in response to these calls (see Figure 1, on the next page, for abbreviated timeline for selecting measures).

The Measures Workgroup mapped the candidate measures into the fleshed-out conceptual framework. The measures within each category of care were evaluated for inclusion in two parts:

1. Measures were selected to maintain consistency with existing consensus-based measure sets where possible. For example, approximately 30 measures were submitted relevant to the management of diabetes. The National Diabetes Quality Improvement Alliance—a collaboration of the American Medical Association, the Joint Commission on Accreditation of Healthcare Organizations, and the National Committee for Quality Assurance—recently announced a set of eight recommended performance measures for the management of diabetes. The Interagency Workgroup focused on these eight measures for use in tracking the effectiveness of diabetes management for the report.

Figure 1. Timeline of the measures selection process

2. The workgroup assessed candidate measures using the following criteria:[1]

   - **Importance.** What is the impact on health associated with the health problem assessed by the measure? Are policymakers and consumers concerned about this area of health care quality? Can the health care system meaningfully address this aspect or problem?

   - **Scientific soundness.** Does the measure actually reflect what it is intended to measure? Does the measure provide stable results across various populations and circumstances? Is there scientific evidence available to support the measure?

   - **Feasibility.** Is the measure in use? Can information needed for the measure be collected in the scale and time-frame required? How much will it cost to collect the data needed for the measure? Can the measure be used to compare different population groups?

Based on these assessments the workgroup identified a preliminary set of about 140 measures for the first quality report. This review included the following steps:

- Measures were sorted into the conceptual framework.

- Using the selection criteria above, measures not suitable were eliminated from the measure set.

- Agencies were given a complete list of the measures and asked to rate their measure submissions and those of others using a structured rating form containing the criteria.

- Agencies were then asked to submit any additional measures.

A particular effort was made to include both process measures that assess what happens to patients during their care and outcome measures that track what ultimately happens as a result of that care. Process measures are more direct assessments of the quality of particular care received and have been shown to be more sensitive for detecting differences between individual health care institutions.[2] However, adequate process measures with national data sources have not as yet been developed in many clinical quality areas. Outcome measures of quality have inherent methodological issues when used to judge quality.[3] The NHQR Interagency Workgroup worked to select process measures that are closely linked to outcomes and outcome measures that are understandable, valid, and can, when appropriate, be adjusted for other factors such as severity of illness or age.

Following the workgroup's work on the measures, the preliminary measure set was reviewed by internal experts and senior management at AHRQ. It was then presented to reviewers within HHS, including the Quality Interagency Coordination Task Force (QuIC) and the HHS Data Council.[i] External feedback was obtained through two primary vehicles. The first was a hearing sponsored by the National Committee on Vital and Health Statistics in Chicago on July 25, 2002. The second was a call for feedback on the NHQR preliminary measure set in the *Federal Register* published August 19, 2002. This feedback was synthesized and reviewed by the NHQR Measures Workgroup with the goal of generating necessary additions, deletions, and alterations to measures in the measure set. This feedback was then reviewed by the NHQR Measures Workgroup and sorted for action. Action items were then forwarded on to the full NHQR Interagency Workgroup which met on January 10, 2003. The full group made a set of recommendations on the proposed final measure set to AHRQ senior leadership, which reviewed these recommendations on January 21, 2003. Following this review, the measure set for the first NHQR was updated and finalized.

The process for selecting home health measures differed from that for the other measures. The preliminary measure set (dated August 19, 2002) did not propose any home health measures. This was because AHRQ was working together with CMS to determine an appropriate set of measures for the CMS public reporting initiative on home health as well as this report. AHRQ and CMS decided that, in the short term, the Outcome and Assessment Information Set (OASIS) measures would be used as the initial measure set because there is more standardization around these measures than any other in home health care.

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[i] The HHS Data Council coordinates all health and non-health data collection and analysis activities of the Department of Health and Human Services, including an integrated health data collection strategy, coordination of health data standards and health information and privacy policy activities. The HHS Data Council consists of all Assistant Secretary and Agency Administrator level HHS officials who have a direct reporting relationship to the Secretary, the HHS Privacy Advocate, and the Secretary's Senior Advisor on Health Statistics. It is co-chaired by ASPE and a rotating Operating Division (OpDiv) head; AHRQ is the current OpDiv co-chair. (See http://aspe.hhs.gov/datacncl/ for more information.)

AHRQ convened the Home Health Quality Measures Technical Expert Panel (TEP) to review the set of OASIS home health quality measures as candidates for both the NHQR and the CMS home health care public reporting initiative. Accordingly, AHRQ convened a TEP October 21-22, 2002, to address these two independent but overlapping efforts being planned by CMS and AHRQ.

Based on the Home Health TEP input, including: the individual panelist prioritization lists (i.e., a significant proportion of panelists listed particular measures as priority items for inclusion), their written comments and the meeting discussion, and AHRQ's proposed 12 OASIS measures for reporting on the quality of home health care in the report, a Federal Register notice was published March 24, 2003 requesting public comments on these measures. Written comments were due by April 23, 2003.[ii]

Data Sources

This report is intended to track quality for the Nation over time. As such, it must rely on readily available, reliable and valid, regularly and consistently collected data at both the national and State levels. These requirements restricted the data sources that could be used for the report. When the call for measures was made, there was also an accompanying request for data sources for the proposed measures. During the developmental phase of the project, the workgroup devised a two-tiered scheme for characterizing possible data sources for the report. Each potential data source was classified according to the criteria presented in Table 1.

Table 1. Two-tiered categorization scheme for examining data sources

Tier I: Substantively relevant and nationally representative:	Tier II: Substantively relevant but:
• For the target population under consideration. • For a given population such as civilian, resident, noninstitutionalized, nursing home residents, etc. • And accurate and reliable with specified relative error. • With the capacity for multiple levels of detail. • With acceptable response rates.	• Adjusted to compensate for limitations in national representation. • Data representative at the subnational level (such as State or Metropolitan Statistical Area). • Data not nationally representative but substantively important.

[ii] A Measures Background Appendix providing detailed information and rationale for inclusion of measures in the measure set is currently in development and will be available online at a later date.

This system of categorization helped to identify established, national data sources that are the standard for providing national estimates over time for the report. The data from these data sources provide estimates for the U.S. civilian, noninstitutionalized population.

Table 2 presents a list of these data sources and compares them to data sources presented in other national quality reporting efforts. This table illustrates how this report lines up with other established national efforts at assessing health care and health care quality. All of the data sources used for these national reports are also used in the NHQR. More detail on the data sources, populations, and other relevant information for the measures is contained in the Measure Specifications Appendix for this report.

Table 2. Comparison of data sources for the NHQR and other quality reporting efforts

NHQR Data Sources	Data Sources for Other Quality Reporting Efforts
• Behavioral Risk Factor Surveillance System (BRFSS) • Dialysis Facility Compare (DFC) • Healthcare Cost and Utilization Project (HCUP) • Health Plan Employer Data and Information Set (HEDIS®) • HIV/AIDS Surveillance System • Medical Expenditure Panel Survey (MEPS) • Medicare Quality Monitoring System (MQMS) • Minimum Data Set (MDS) • National Ambulatory Medical Care Survey (NAMCS) • National CAHPS® Benchmarking Database (NCBD) • National Health and Nutrition Examination Survey (NHANES) • National Health Interview Survey (NHIS) • National Home and Hospice Care Survey (NHHCS) • National Hospital Ambulatory Medical Care Survey (NHAMCS) • National Hospital Discharge Survey (NHDS) • National Immunization Survey (NIS) • National Nosocomial Infections Surveillance (NNIS) • National Nursing Home Survey (NNHS) • National TB Surveillance System (NTBSS) • National Vital Statistics System —and Infant Death Data (NVSS-I) • National Vital Statistics System, Mortality (NVSS-M) • Outcome and Assessment Information Set (OASIS) • Quality Improvement Organization (QIO) • Surveillance, Epidemiology, and End	***Healthy People 2010*** • Behavioral Risk Factor Surveillance System (BRFSS) • Continuing Survey of Food Intake by Individuals (CSFII), 1994-96 • HIV-AIDS Case Surveillance System • Medical Expenditure Panel Survey (MEPS) • Monitoring the Future Study (MTF) • National Ambulatory Medical Care Survey (NAMCS) • National Crime Victimization Survey (NCVS) • National Health and Nutrition Examination Survey (NHANES) • National Health Interview Survey (NHIS) • National Hospital Ambulatory Medical Care Survey (NHAMCS) • National Hospital Discharge Survey (NHDS) • National Household Survey on Drug Abuse (NHSDA) • National Notifiable Disease Surveillance System (NNDSS) • National Electronic Telecommunications System for Surveillance (NETSS) • National Profile of Local Health Departments (NPLHD) • National Survey of Family Growth (NSFG) • National Vital Statistics System, Mortality (NVSS-M) • National Vital Statistics System, Natality (NVSS-N) • 1999 National Worksite Health Promotion Survey (NWHPS) • School Health Policies and Programs Study (SHPPS) • State Tobacco Activities Tracking and Evaluation System (STATE) • STD Surveillance System (STDSS) • United States Renal Data System (USRDS) • Youth Risk Behavior Surveillance System (YRBSS) ***National Committee for Quality Assurance*** • Health Plan Employer Data and Information Set (HEDIS®)

Results Program (SEER) • United States Renal Data System (USRDS)	***Commonwealth Report on Quality of Health Care in America*** • Behavioral Risk Factor Surveillance System (BRFSS) • Commonwealth Fund International Health Policy Survey • Community Tracking Study Household Survey (Center for Studying Health System Change) • Health Plan Employer Data and Information Set (HEDIS®) • Medicare Cooperative Cardiovascular Project • Minimum Data Set (MDS) • National Health Interview Survey (NHIS) • National Health Interview Survey on Disability • National Hospital Ambulatory Medical Care Survey (NHAMCS) • National Immunization Survey (NIS) • National Registry of Myocardial Infarction, American College of Cardiology • National Survey on Nursing Homes (NewsHour with Jim Lehrer/Kaiser Family Foundation/Harvard School of Public Health • On-line Survey, Certification and Reporting (OSCAR) system; CMS • Picker surveys of 272 self-selected hospitals • Quality Improvement Organization (QIO) • Surveillance, Epidemiology, and End Results Program (SEER) • Vital Statistics

Significance Testing and Assessing Relevant Differences

With a range of conditions and measures, AHRQ established a systematic process for reviewing data and assessing relevant differences. Reported comparisons are for statistically significant differences unless otherwise noted. This process can be summarized as follows:

- All tables were generated for all measures with the appropriate estimates and standard errors as needed for the table analysis. Standard errors are numeric representations of the error that occurs because the estimate is based on a sample of a larger population.

- Statistical testing was conducted on the estimates. The tests done were two-tailed t-tests of significance at the alpha level of 0.05. All of the data that are highlighted in this report meet this statistical criterion. The testing included these steps.

    - For national tables, differences between estimates for subgroups and the identified comparison (reference) group were tested for statistical significance.

    - For national tables with data over time, the least recent year was used as the reference and subsequent years were tested versus that reference year.

    - For State tables, States were compared with the national average. (Please note that these differences between States and the national average were computed solely to highlight opportunities for improvement nationally rather than as assessments of the performance of individual States.)

- The report team systematically assessed the estimates for changes over time nationally, between relevant subgroup populations nationally and between States and the national average. Appropriate differences were highlighted for review.

- The highlighted differences noted by AHRQ's clinical team were then reviewed by AHRQ senior leadership and a team of national experts in areas of the NHQR framework.

The report cites various quality improvement studies. On such studies, none of the quality indicator information discussed is part of the official report dataset. Therefore, AHRQ did not perform statistical testing on these indicators.

Data Suppression

Sometimes not all the data collected from surveys, medical records, or administrative sources can be presented. Oftentimes, this is due to the small number of cases in particular categories of reporting that are not considered reliable. Even more important, presentation of these numbers may jeopardize confidentiality. When data are collected and analyzed but not presented for reasons such as these, it is called suppression. Different data collection systems apply different criteria to suppress data that are deemed unreliable ranging from no suppression of data to suppressing data through complicated algorithms. The rule employed for data suppression for this report was to adhere to the rules specified by the data source from which the measure was derived. (Detailed information on each of the data sources is contained in the Measure Specifications Appendix.) For most data sources, there were two main data suppression criteria: 1) cell values based on unweighted N less than 30 and 2) relative standard errors greater than 30% when appropriate. Some data systems have more stringent suppression criteria, and their criteria were maintained in this report for their data. For example, the National Health Interview Survey (NHIS) suppresses data with cell sizes less than 50, and the Medical Expenditure Panel Survey (MEPS) suppresses data with cell sizes less than 100. NHIS and MEPS data presented in this report adhere to these more conservative standards.

A general exception to these data suppression criteria is for data that encompass population counts such as vital statistics. Such data typically have their own suppression criteria. For example, mortality statistics based on fewer than 20 deaths are typically suppressed; data presented in this report adhere to this criterion.

Limitations of the Measure Set and Analysis

This report explicitly relies on measures that have broad national consensus. It is built on measures focused on the Nation's health care priorities as determined by associated morbidity and mortality as well as the opportunity for improvement. In order to fulfill the congressional mandate, the report is also based on measures for which national data are available. Consequently, in many areas covered in the report, it does not rely on the latest research findings on quality of care measurement. Wherever possible, we have attempted to cite appropriate and promising research on quality measurement.

The legislative charge of the report is to provide a “snapshot” of the Nation’s quality of care. As a snapshot, it is intended to neither test hypotheses nor prove causation for the apparent gaps in quality but to provide a benchmark for future analyses. The statistical analysis performed for the report is in keeping with this goal and the scope of the report.

Bivariate analyses were performed for the report as the first step to presenting where the Nation stands in terms of quality of care. While multivariate analyses are preferable for more detailed exploration of the data, they were not feasible in the timeframe of the initial report. Future editions of this report will include analyses of the relationship between the multiple factors that may explain differences between and among these populations. Adjusting for known contributing factors, such as age and sex, can help present more accurate results. In addition, nearly half of the measures in the report (67 of 147) present adjusted data. The measure set does not include any measures of structural quality.

Also, this is not a report on the level of quality at individual hospitals or doctors’ offices. It is intended as a tool for Federal and State policymakers, and therefore, it tracks quality at the national and, wherever possible, State levels. Data are reported in the body of the report and in the detailed appendix tables at the national and, if data exist, State levels. This means that quality is discussed in terms of the following: a) national performance over time (if trend data are available); b) national performance for key priority subpopulations; and c) variation between States.

This is the first in a series of annual reports to Congress. Comments received during the design and public comment stages of the report development have helped improve the design of this first report. However, it will only be possible to implement recommendations in future reports. Potential areas for improvement are discussed in the report, and feedback on this first report is expected to help shape subsequent editions.

Additional Information

For information on the specifications for the measures and the data sources, readers are encouraged to consult the Measure Specifications Appendix.

Readers are also encouraged to consult the AHRQ Web site for more information on the report and its design at www.ahrq.gov.

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Chapter 3. Effectiveness[i]

Cancer

Key Findings:

- The majority of women are screened for breast (70.3% of women over 40) and cervical cancers (81% of women 18 and over).
- Less than half of those who should have colorectal cancer screening do so.
- Colon (8.0 per 100,000) and breast cancers (7.5 per 100,000) have higher rates of late-stage detection than rectal and cervical cancers.
- Late detection of some cancers, notably cervical and colorectal cancer, has been decreasing over the last two decades.

Background and Impact[1]

Cancer is the Nation's second leading cause of death, after heart disease. The number of new cancer cases is projected to reach over 1.3 million, and the number of cancer deaths is expected to top 550,000 in 2003. Four cancers: (lung, colorectal, breast, and prostate) account for over half of the new cases. The projected deaths from these cancers in 2003 are:

- Lung cancer: 157,000 men and women
- Breast cancer: Nearly 40,000 women
- Colorectal cancer: More than 57,000 men and women
- Prostate cancer: More than 28,000 men

Although deaths from cervical cancer have declined over the last several decades, 4,100 U.S. women will die of this cancer in 2003, and 12,000 new cases are expected to be diagnosed in the same period.

Cancer is among the most expensive diseases with projected total expenses of $189.5 billion in 2003, including over $64.2 billion in total direct health care expenses.[2]

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[i] Note: Detailed information about the measures used in Chapter 3 is contained in the Measure Specifications Appendix. In addition, the Tables Appendix contains all the data tables. The sections in this chapter highlight selected findings from a subset of the measures for each of the conditions discussed.

How the NHQR Measures Cancer Quality of Care

Experts agree on the elements of good quality care and how to measure it for some cancers and for some aspects of care. This report includes three kinds of measures for cancer: screening, advanced stage detection, and mortality. Additionally, because cancer patients account for more than half of those who receive hospice care,[3] this report discusses hospice as a dimension of cancer care. (The specific measures used in this report are listed in a table at the end of this section.) The cancers selected for inclusion in the report include breast, colorectal, cervical, lung, and prostate. These cancers, excluding cervical cancer, were chosen because they represent the four most common cancers. There are gaps in the full array of possible measures of health care needs, for the wide variety of cancers, and across the spectrum of health care approaches.

Screening

Screening is defined as the "application of a test to a population to classify individuals as likely or not likely to have a disease."[4] Screening allows for the detection of precancerous abnormalities and the early detection of disease and, when followed by appropriate treatment, can lead to a reduction in the likelihood of illness and death from the cancer. This report includes consensus-based screening measures for breast, cervical, and colorectal cancers.

Detection at Advanced Stage

This report contains measures that track the incidence rates of breast, cervical, and colorectal cancers that are diagnosed at advanced stages when treatment options are limited and less successful in preventing mortality. The incidence of advanced stage cancer detection is an indicator of the success of screening, i.e., the lower the rate the greater the success.

Mortality

Cancer mortality rates are a summary indicator of the success or failure of the Nation's collective health care system in combating cancer through prevention, screening, and treatment.

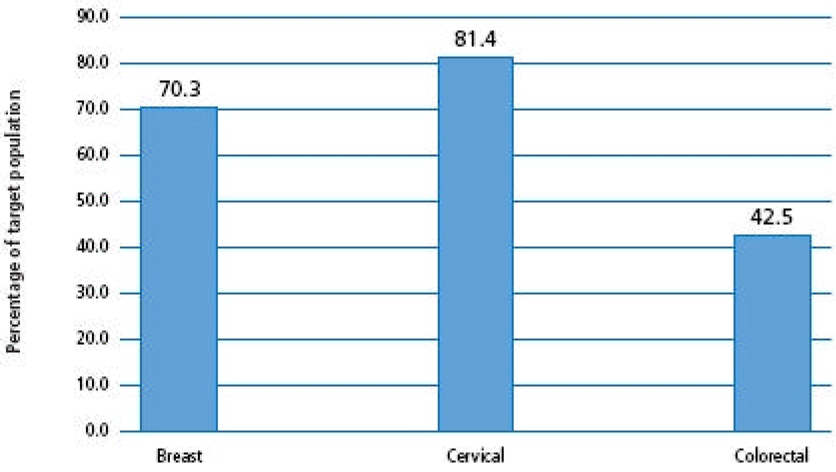
How the Nation Is Doing[ii]

This section is organized by cancer site—i.e., breast, cervical, colorectal, lung, and prostate—including text on the results for each cancer. For ease of presentation, graphs of each measure are reported across all cancer sites with reference to the graphs in the text. The end-of-life care measures are not cancer-specific, and the overall data are addressed in a separate section.

Figure 1 presents the screening rates, Figure 2 presents the incidence of advanced-stage detection, and Figure 3 presents the mortality rates.

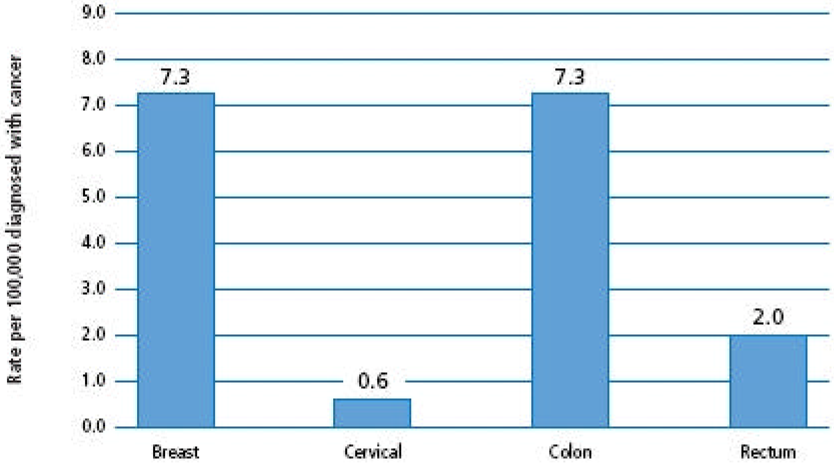
[ii] Adjusting for known contributing factors, such as gender, age, and insurance status (multivariate analysis) would allow for more detailed exploration of the data, but this generally was not feasible for this report. Any adjustments that were done are noted in the detailed tables. The data presented in this report do not imply causation.

Figure 1. Screening rates for selected cancers, 2000



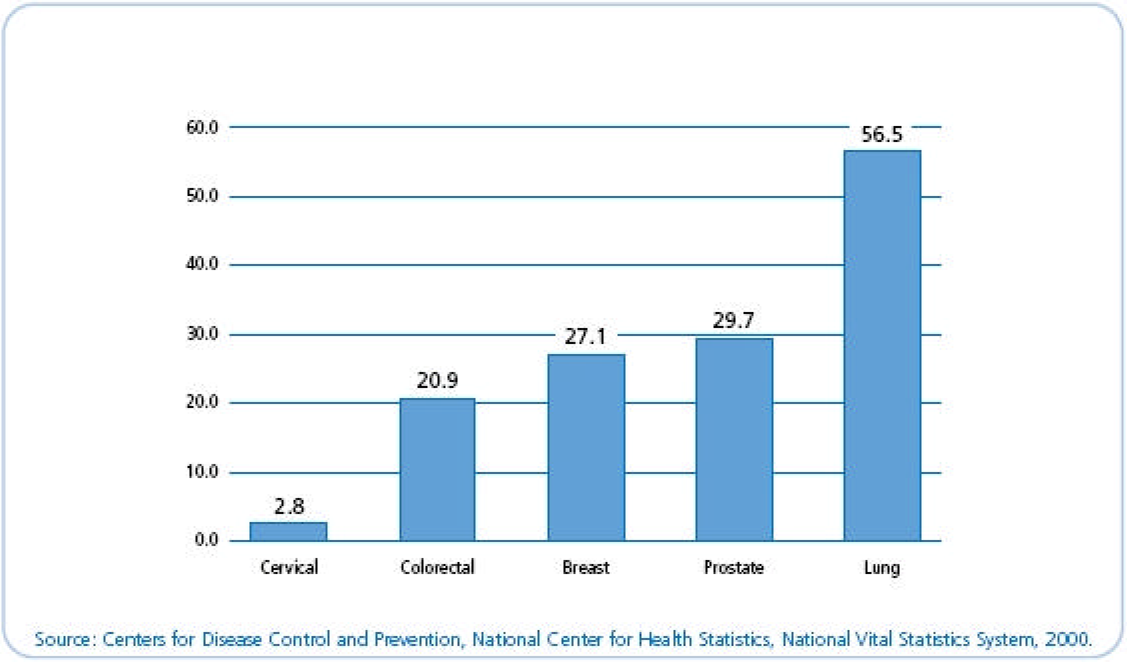
Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Health Interview Survey, 2000.

Figure 2. Rates of new cases of advanced-stage disease by cancer site,2000



Source: SEER Program, National Cancer Institute, November 2002 submission, year of diagnosis 2000.

Figure 3. Mortality rates in target population, per 100,000,2000



Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Vital Statistics System, 2000.

Breast Cancer

Screening

A majority of women over the age of 40 (70.3%) are being screened with mammography for breast cancer (see Figure 1), which already meets the Healthy People 2010 objective.

Early Detection

As shown in Figure 2, the incidence of new cases of breast cancer cases detected at an advanced stage is 7.3 per 100,000 women. According to the National Cancer Institute (NCI), the rate has not declined over the last two decades as have the rates for colon, rectal, and cervical cancers.[5]

Mortality

The death rate from breast cancer is 27 per 100,000 females as shown in Figure 3. According to NCI data, the trend in mortality shows a decline of an average of 2.3% per year through the 1990s.[6] The decrease in the death rate has been attributed, in part, to increased mammography[7] and to the broader dissemination of adjuvant chemotherapy into medical practice.[8]

Cervical Cancer

Screening

Cervical cancer screening rates are higher than both breast and colorectal cancer screening rates. Eighty-one percent of women report having a Pap test within the past 3 years (see Figure 1).

Early Detection

The incidence of new cases of cervical cancer detected at an advanced stage is 0.6 per 100,000 and is lower than the rate of advanced-stage detection for breast, colon, and rectal cancers (see Figure 2). Additionally, the trend in the percentage shows a significant decline over the last two decades.[9]

Mortality

The mortality rate (2.8 per 100,000 women) for cervical cancer is relatively low compared to the other cancers discussed in the report (see Figure 3).

Colorectal Cancer

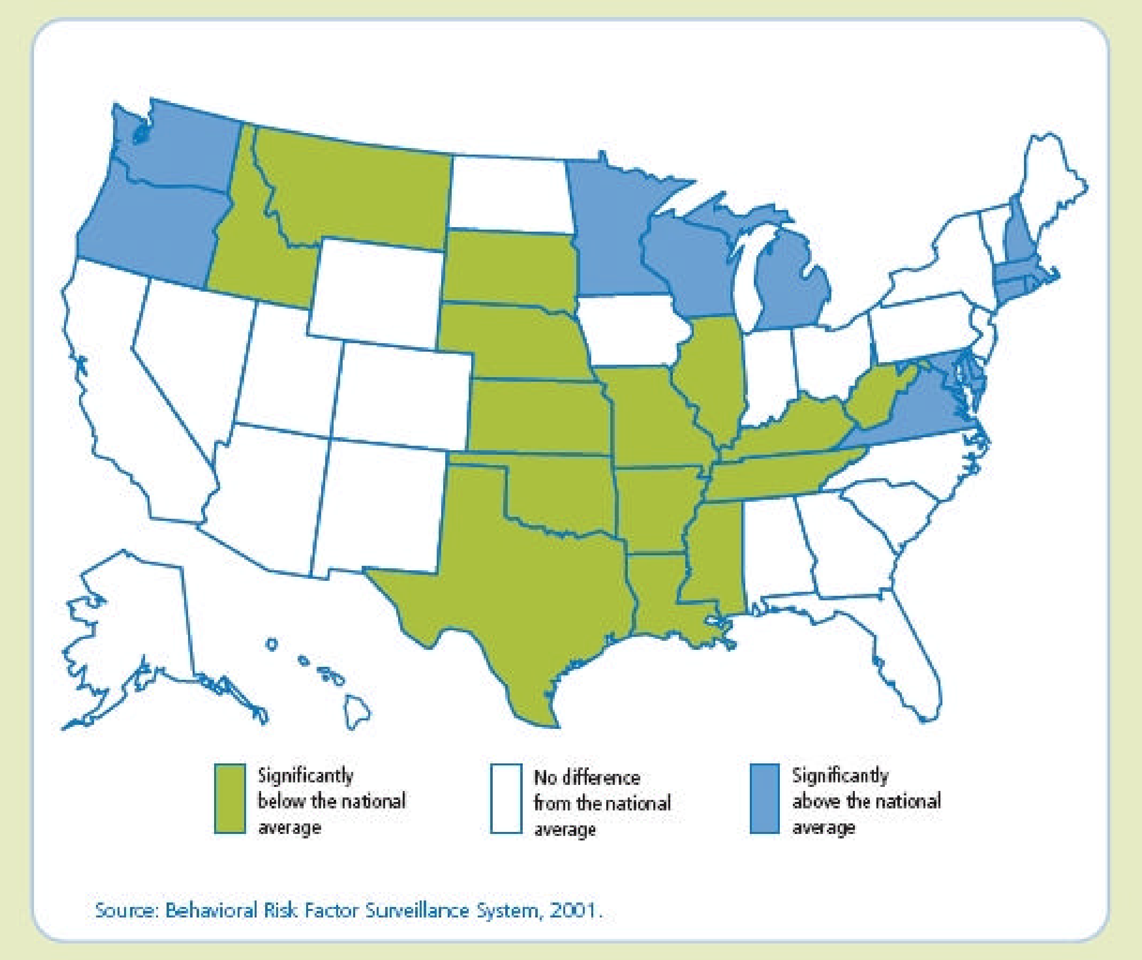
Screening

Nationally, 42.5% of adults 50 years of age or older report ever having had a sigmoidoscopy, colonoscopy, and/or a fecal occult blood test (FOBT) in the last 2 years (see Figure 1).[iii] This rate is also markedly lower than the screening rates for breast and cervical cancer. Screening rates for colorectal cancer vary by State (see Figure 4).

[iii] This report measures include endoscopy (38.9%) and FOBT (33.3%) separately. NHIS (2000) reports on the receipt of either endoscopy or FOBT which is a more inclusive reporting of colorectal screening.

Figure 4. State variation in colorectal cancer screening

This chart displays variations by State in the rates for two important screens for colorectal cancer, flexible sigmoidoscopy and colonoscopy, expressed as above, at, or below the national average. Only 33% of adults age 50 and older nationally report having had either of these tests. Minnesota has the highest, or "best in class," rate at 62.2%. Regions with rates above the average include (most of) New England, some Mid-Atlantic States including Virginia and Maryland, the Northwest, and the upper Midwest lakes region, including Wisconsin, Michigan, and Minnesota.



Source: Behavioral Risk Factor Surveillance System, 2001.

Early Detection

The rate of advanced stage diagnosis for cancers of the colon and rectum is 7.3 and 2 per 100,000 new cases, respectively (see Figure 2). According to NCI, the trend shows a significant decline over the last two decades for both cancers.[10]

Mortality

The mortality rate from colorectal cancers is 20.9 per 100,000 (see Figure 3) and, according to NCI, it has been declining over the past 15 years at an average of 1.7% per year.[6]

Lung and Prostate Cancers

The only measure in the report for these cancers is the mortality rate. National measures on screening and advanced stage detection for these cancers have not been agreed to by experts and are not included in this report.

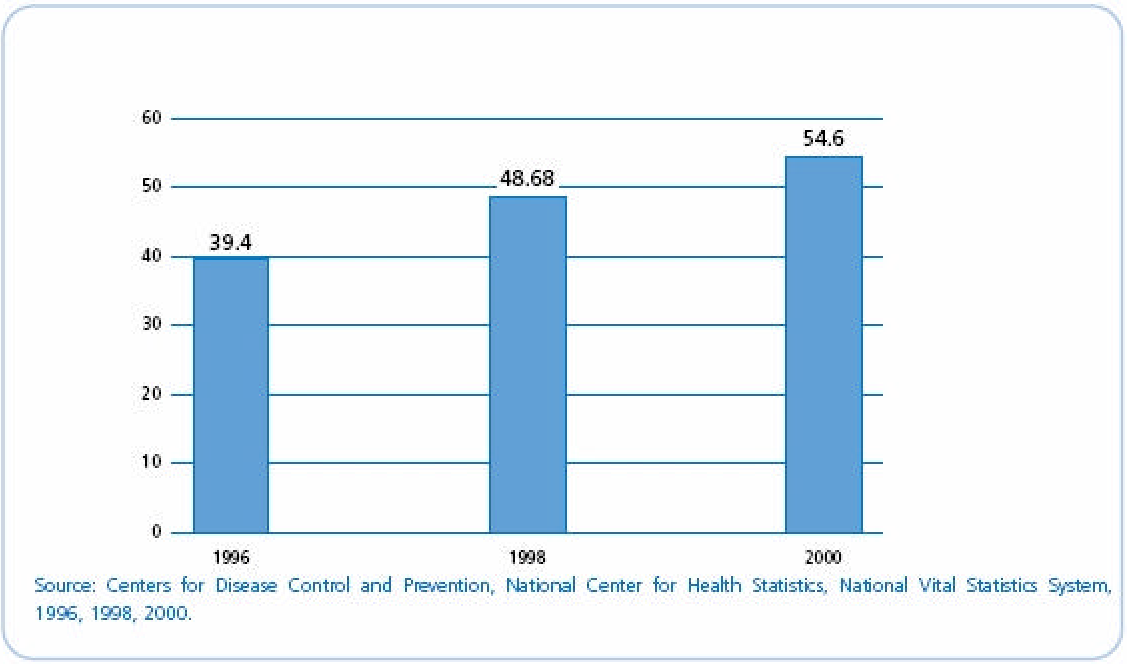
Lung cancer has the highest mortality rate (58.5 per 100,000) of all cancers discussed in the report. The death rate for lung cancer has decreased throughout the 1990s to an average 0.7% per year.[6]

Prostate cancer has the second highest death rate (29.7 per 100,000) of all cancers discussed in this report. The death rate declined throughout the 1990s rising to an average 4.0% per year in the late 1990s.

End-of-Life Care

The median length of stay until death in hospice care for cancer patients who received hospice care is 15.4 days. For all hospice patients, the median stay declined from 27.4 days in 1994 to 15.6 days in 2000.[11] Cancer is the primary diagnosis for hospice admission, and more cancer patients who are nearing death are receiving hospice care. Figure 5 shows the percentage of terminally ill cancer patients who received hospice care between 1996 and 2000. The percentage increased from 39% in 1996 to 55% in 2000.

Figure 5. Percent of terminally ill cancer patients who received hospice care,1996-2000



Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Vital Statistics System, 1996, 1998, 2000.

Screening, Early Detection, and Mortality

In summary, one of the safest, simplest, and most cost-effective ways to reduce cancer morbidity and mortality is to raise the screening rates for selected cancers. There is considerable consensus among experts about high quality screening practices.[12,13,14] Although the majority of women report screenings for breast and cervical cancer, less than half of men and women over the age of 50 report screening for colorectal cancers.

Most cancers that are detected at an advanced stage are more resistant to therapy, more expensive to treat, and have a lower survival rate. The detection rate of some cancers at an advanced stage, notably cervical and colorectal, has been declining over the last two decades, although there has been no improvement in the rates for advanced-stage detection of breast cancer. Mortality rates for the cancers covered in this report have also been declining, showing that advances in research and treatment have saved lives. More terminally ill cancer patients are using hospice care. There is considerable variation across the States in cancer screening. Improvement is possible and necessary.

What We Don't Know

Although substantial investments have produced impressive advances in knowledge and higher survival rates for many cancers, there is much more to learn and apply about good quality of care. First, we need to learn more about screening. For example, effective screening techniques are needed for more cancers, especially the most deadly (e.g., lung). Many people are not screened, even when effective tests are available. Screening rates are less than optimal due to the negative influences of lack of health insurance, lack of a usual source of care, low income, low education, and other unknown factors. There is evidence that interventions that increase patient and provider awareness of the need for screening, (e.g., reminder and notification systems) result in higher rates of screening. More precise information is needed to target action. Similarly, more research is needed to understand why many people are diagnosed at an advanced stage of cancer. NCI has funded a stream of research to seek answers to this critical question.[15]

Second, more measures are needed to track quality of care for cancer treatment, specifically, those that address the extent to which evidence-based treatments are being used. The NCI initiated a program called Patterns of Care/Quality of Care that identifies specific cancer treatments that are recommended and tracks the usage levels of these treatments using national, population-based data. Specific examples of these studies are documentation of the level of use and trends in use of breast conserving surgery and radiation therapy and systemic adjuvant therapy for breast, colon, and rectal cancers.[16] These efforts will provide valuable knowledge that will lead to nationally recognized measures.

Third, more measures are needed to evaluate end-of-life care. End-of-life care is most often about palliative care, which is intended to relieve symptoms and improve quality of life for patients nearing death. Measurement needs to move toward the patients' experiences with care, including symptom control and quality of life.[15]

What Can Be Done

Much progress has been made in cancer, including the continued decline in death rates for the four most common cancers addressed in this report. However, much more still needs to be done, "including wider application of what science has shown to be effective in preventing, screening, and treating cancer."[17] Broader delivery of mammography and colorectal cancer screening to all population groups may reduce the burden of cancer and improve health for all communities. Reduced tobacco use[18] and increased consumption of fruits and vegetables[19] will prevent certain cancers. Cancer awareness and outreach programs have also proven successful and show promise of even greater success in the future. One example of an important effort is the National Breast and Cervical Cancer Early Detection Program (NBCCEDP), sponsored by CDC. The goal of this program is to help low-income, uninsured, and underserved women gain access to early detection screening for breast and cervical cancer.[20] Since its creation in 1990, the program has provided about 3 million screenings and diagnosed more than 12,000 breast cancers and 800 invasive cervical cancers.[21] Altogether, the number of women served by NBCCEDP has grown from about 55,000 in 1991-92 to 372,000 in 2001.[22] The NBCCEDP's efforts support the use of coalitions and partnerships, involve church groups and others, eliminate barriers to access (such as linguistic and cultural differences), and train doctors and other health professionals, as well as provide national guidance on screening techniques, diagnostic skills, and case management to ensure that current best practices are used.[23] Quality improvement programs conducted by providers improve the processes of care. For example, the Medicare program has set a national goal to improve mammography rates through its Quality Improvement Organizations (QIOs). In less than 2 years of the program’s initiation, the QIOs had achieved substantial success in most States.[24]

Research is needed to develop effective means to prevent breast and prostate cancer.[6] Better understanding of the process of diffusion may help translate research results into action at the delivery system and community levels.

Sharing best practices may help cancer control planners, providers, and consumers. Good examples of these include the National Dialogue on Cancer, a coalition of national partners from the private, public, and not-for-profit sectors, brought together to disseminate advances in cancer care;[25] the Cancer Control PLANET (Plan, Link, Act, Network with Evidence-based Tools), a Web-based tool to help stakeholders in the above activities;[26] and www.qualitytools.ahrq.gov, a Web-based portal from the Agency for Healthcare Research and Quality, which provides information on quality measures and quality improvement initiatives.

List of Measures

Cancer

Measure title	*National*	*State*
Screening for breast cancer:		
Process: % of women (age 40 and over) who report they had a mammogram within the past 2 years	Table 1.1a (00)	Table 1.1b (01) Table 1.1c (00)
Outcome: Rate of breast cancers diagnosed at advanced stage	Table 1.2 (00)	—
Screening for cervical cancer:		
Process: % of women (age18 and over) who report that they had a Pap smear within the past 3 years	Table 1.3a (00)	Table 1.3b (01) Table 1.3c (00)
Outcome: Rate of cervical cancers diagnosed as invasive (includes local, regional, and distant disease except in situ disease)	Table 1.4 (00)	—
Screening for colorectal cancer:		
Process: % of men and women (age 50 and over) who report they ever had a flexible sigmoidoscopy/colonoscopy	Table 1.5a (00)	Table 1.5b (01)
Process: % of men and women (age 50 and over) who report they had a fecal occult blood test (FOBT) within the past 2 years	Table 1.6a (00)	Table 1.6b (01)
Outcome: Rate of colorectal cancers diagnosed as regional or distant staged cancers	Table 1.7	—

(cont. next page)

Cancer

Measure title	*National*	*State*
Cancer Treatment:		
Outcome: Cancer deaths per 100,000 people per year for all cancers	Table 1.8a (00) Table 1.8b (99)	Table 1.8c (00)
Outcome: Cancer deaths per 100,000 people per year for most common cancers, prostate cancer	Table 1.9a (00)	Table 1.9b (99) Table 1.9c (00)
Outcome: Cancer deaths per 100,000 people per year for most common cancers, breast cancer	Table 1.10a (00)	Table 1.10b (99) Table 1.10c (00)
Outcome: Cancer deaths per 100,000 people per year for most common cancers, lung cancer	Table 1.11a (00) Table 1.11b (99)	Table 1.11b (99) Table 1.11c (00)
Outcome: Cancer deaths per 100,000 people per year for most common cancers, colorectal cancer	Table 1.12a (00) Table 1.12b (99)	Table 1.12c (00)
Palliative care:		
Process: Cancer deaths in hospice per 100 cancer deaths	Table 1.13a (00) Table 1.13b (98) Table 1.13c (96)	—
Process: Median length of stay for cancer patients who received hospice care	Table 1.14 (00)	—

Note: See Tables Appendix for tables listed above.

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End Stage Renal Disease (ESRD)

Key Findings:

- Almost 90% of in-center hemodialysis patients are receiving adequate dialysis.
- More than 75% of ESRD patients have good anemia management.
- Only 1 in 5 ESRD patients is placed on a transplant waiting list. This measure reflects whether doctors are referring patients for a transplant workup evaluation.

Background and Impact

Chronic kidney disease (CKD)[i]i is a progressive failure of the kidneys to filter waste and fluid from the body.[1] Nearly 20 million (19.2 million) Americans are living with this condition.[2]

Although CKD cannot be cured, the progression of this condition may be slowed with early intervention.[3,4] Left untreated, CKD can lead to a complete shutdown of kidney function—a condition known as end stage renal disease. Because CKD shows no symptoms in its early stages, many people who have the condition do not seek treatment until after they begin to experience the symptoms associated with advanced stages of the disease.[5,6] ESRD is on the rise.[4,7,8]

The large number of people with CKD is partly attributable to an increase in the rates of diabetes (especially type 2 diabetes) and hypertension.[9] Forty percent of all CKD patients have diabetes, while 26% suffer from hypertension.[8,10] The growing number of people with these two diseases is due in part to lifestyle factors, such as obesity and lack of exercise.

CKD is also associated with cardiovascular[1,3,9,11] Almost 40% of patients who begin dialysis are found to have cardiovascular disease, and over half of ESRD mortality is caused by cardiovascular disease.[3,12] Populations at risk for CKD, and ultimately ESRD, include not only those with diabetes and hypertension, but also certain racial and ethnic groups. The incidence of ESRD among African Americans, American Indians/Alaska Natives, Asians/Pacific Islanders, and Hispanics is approximately four times greater, three times greater, 50 percent greater, and 40 percent greater than it is for white Americans, respectively.[13]

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[i] Clinical definitions of CKD include an elevated serum creatinine or the presence of microalbuminuria. More recently, the National Kidney Foundation's Kidney Disease Outcomes Quality Initiative (K/DOQI) defined CKD in terms of the glomerular filtration rate, the best overall measure of kidney function. See National Kidney Foundation. K/DOQI clinical practice guidelines for chronic kidney disease: evaluation, classification, and stratification. Am J Kidney Dis. 2002 Feb;39(2 Suppl 1):S1-266.

Routine screening and treatment with currently available therapies can reduce the morbidity and mortality of CKD and slow the advance towards ESRD. Treating ESRD requires renal replacement therapy (either a kidney transplant or dialysis). Without one of these therapies, the disease is fatal. Even with dialysis, the annual mortality rate is about 20%.[14,15]

The human toll is substantial not only in terms of lives lost, but also in quality of life lived. The majority of ESRD patients are on hemodialysis at dialysis centers. These patients must get dialysis 4 days a week, 4 hours a day, making it difficult for them to continue to work or go to school.[16] ESRD patients with a kidney transplant generally experience better quality of life, living from 8 to 25 years longer than those without.[17] For many patients, transplant is the treatment of choice.

CKD, including ESRD, is expensive to treat. In 2000, almost $19 billion was spent treating the disease, with the Medicare program paying some $14 billion of that total.[18] Between 1991 and 2001, Medicare spending for outpatient dialysis services increased about 10% per year, the fastest growing expenditure of the Medicare program.[19] The Medicare program has been the primary bill-payer for ESRD treatment since 1972, when Medicare began providing coverage for individuals with ESRD, regardless of age. Currently, Medicare covers 93% of the ESRD patient population.[20]

How the NHQR Measures ESRD Quality of Care

Well-established measures exist for tracking quality of care for ESRD patients, particularly measures relating to adequacy of dialysis and management of anemia. These measures, based on the National Kidney Foundation (NKF) Dialysis Outcome Quality Initiative Clinical Practice Guidelines, were developed and fully endorsed by the renal community, as well as by public- and private-sector partners. This was done under the auspices of the Medicare program's Clinical Performance Measures Project, known as the CPM Project.[21,22] National data for this set of measures, with the exception of the vascular access measures, have been collected and reported annually since 1994. Vascular access measures have been collected by the CPM Project since 1999.

A 1997 congressional directive to develop public reporting measures that would help consumers choose a dialysis facility led to development of three facility-level measures. All three have been reported (and updated annually) on Medicare's consumer Web site, Dialysis Facility Compare (DFC, at www.medicare.gov/ Dialysis/Home.asp), since January 2001. Two are comparable to similar measures collected under the CPM Project; the third addresses the relatively high rate of mortality within the dialysis population. Both national and State-level data are available for the DFC measures, while national and regional data, but not State data, are available for the CPMs. Because of the lack of State data for the CPMs, the DFC measures were chosen for inclusion in this report.

In addition, because transplantation is the preferred treatment choice for so many ESRD patients, the NHQR also includes two quality measures for tracking transplantation. Thus the NHQR uses these five measures to track care for patients with ESRD:

- Percentage of hemodialysis patients with a urea reduction ratio (or URR) equal to or greater than 65; this measures how well urea, a waste product in the blood, is eliminated.
- Percentage of patients with a hematocrit of 33 or greater; this measure tracks how well the patient's anemia (low blood count) is managed.
- Patient standardized mortality ratio,[ii] which compares actual with expected rates of survival at both the national and State levels.
- Percentage of dialysis patients on a waiting list for transplantation; this measure reflects whether doctors are referring patients for a transplant workup evaluation.
- Percentage of patients with treated chronic kidney failure who receive a transplant within 3 years of entry on the waiting list.

No system exists to collect data on early stage CKD patients that is comparable to that used for ESRD. There is no agreement on a core set of measures for tracking quality of care for patients with early stage CKD.

How the Nation Is Doing[iii]

Impressive gains have been made in the quality of care for kidney dialysis patients since measurement began in the early 1990s.[23] Currently, almost 90% of in-center hemodialysis patients are receiving adequate dialysis (as measured by either URR of 65 or greater or a comparable measure).[iv] Tracking of this measure began in 1994. The rate has increased from about 74% in 1996 to 89% in 2000. This gain is evidenced for both sexes and across all ages and races (University of Michigan, 2000).

More than 75% of ESRD patients have good anemia management (measured as either hematocrit of 33% or higher or a comparable measure) (University of Michigan, 2000).

[ii] On CMS's Dialysis Facility Compare (DFC) Web site (http://www.medicare.gov/Dialysis/Home.asp), this measure is converted into "Patient Survival Rate."

[iii] Adjusting for known contributing factors, such as gender, age, and insurance status (multivariate analysis) would allow for more detailed exploration of the data, but this generally was not feasible for this report. Any adjustments that were done are noted in the detailed tables. The data presented in this report do not imply causation.

[iv] The CPM project uses Kt/V, while DFC uses URR. The measures are comparable, but due to differences in the measures themselves, as well as their data sources, percentages reported may not be identical. The same is true for hemoglobin and hematocrit.

One in five ESRD patients reports being registered on a transplant waiting list. States vary substantially in registration rates for transplantation (USRDS, 2000). States also vary significantly in the proportion of ESRD patients with transplants, with the best performing States achieving a rate that is more than double the national average.

What We Don't Know

Measures for tracking quality of care for early stage CKD are needed. Spurred by clinical performance guidelines released in 2000 by the NKF's Kidney Disease Outcomes Quality Initiative (K/DOQI), greater emphasis is now being placed on treatments for earlier stages of the disease, as well as on prevention. Two areas that show the most promise for development of candidate performance measures are:

- Early detection of kidney malfunction with calculation of the glomerular filtration rate (GFR)—a measure of overall kidney health—from serum creatinine measurement.

- Proportion of patients diagnosed with CKD who are referred to a nephrologist early. Early referral is associated with lower mortality, greater rates of treatment for anemia, and higher rates of permanent vascular access (so that the risk of infection and clots from dialysis can be kept low).[24]

In addition, baselines are not established in the following areas:

- Blood pressure control through the appropriate use of prescription drugs.

- Blood sugar, salt, potassium, and cholesterol control through dietary changes.

- Malnutrition prevention.[v,vi]

What Can Be Done

Rapid progress is being made in many areas of chronic kidney disease.

First, progress is being made in available therapies. The Food and Drug Administration reports that improved hemodialysis machines are being reviewed.[25] Initial clinical trials have been completed for a new therapy that apparently works well to reduce anemia and may also eliminate the need for frequent repeated injections. Early treatment of anemia can result in reduced morbidity and mortality for patients with CKD, including reduction in the need for blood transfusions, fewer hospitalizations, fewer problems in heart function, and increased energy. The

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[v] Albumin level, an approximate indicator of nutrition, is part of the CPMs collected by the Medicare program. Because of its interaction with c-reactive protein, an indicator of inflammation which raises a patient's score on serum albumin, this measure is being reevaluated.

[vi] Updated clinical practice guidelines have been released by K/DOQI on nutrition; these may form the basis for creation of appropriate performance measures.

treatment of choice has been recombinant human erythropoietin (r-HuEPO), which requires frequent re-injection because of its short half-life (4 to 8-1/2 hours). Repeated injections cause pain and discomfort to the patient.[26]

Second, new research efforts have been initiated in a number of areas related to CKD. The National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) is funding several studies:

- The Prospective Cohort Study of Chronic Renal Insufficiency is designed to provide new information on the risk factors for progression to kidney failure and for cardiovascular disease in people with CKD.

- A study of the longitudinal aspects of pediatric kidney disease is important because some of the issues affecting children with CKD differ substantively from those of adults. Moreover, there is little information available concerning both the etiology and the magnitude of some of the impairments that affect children with CKD.[27]

- In conjunction with the Department of Veterans Affairs (VA), NIDDK is also funding a study on strategies for managing renal support in critically ill acute renal failure (ARF) patients. The study will be a multicenter, prospective, randomized, parallel-group trial that will compare intensive renal support with conventional management of the disease.[28]

Third, CKD educational efforts also continue to grow and improve. These efforts include a national program designed to raise awareness about CKD and the importance of proper kidney care, entitled "Kidney Care: Finding Your Strength."[29] Another major educational effort was launched in 2001 by NIDDK, called the National Kidney Disease Education Program, which includes among its goals slowing the progression of kidney disease in its early stages and preventing kidney disease in those at risk.[5]

Fourth, demonstration projects are planned. CMS is encouraging innovative approaches to ESRD through a new disease management demonstration program. This program will include a focus on the use of evidence-based practice guidelines, services that facilitate greater patient education and self-care, nephrologist involvement, protocols for anemia and diabetes management, coordination of care and attention to comorbidities (e.g., hypertension), and experienced care managers who will oversee the patient's overall well-being.[30] The program includes three different delivery models and two different payment options (capitation and fee-for-service bundled payment), along with an incentive payment for quality. The quality incentive payment is based on two kinds of targets according to specific algorithms: 1) an improvement target (for those who show marked improvement over time) and 2) a threshold target (set relative to a national performance level).

Lessons Learned–CMS's ESRD Health Care Quality Improvement Program

In the Medicare ESRD program, steady improvement has been made in the quality of care provided to dialysis patients. In the early 1990s, spurred to action by evidence of poor quality care, Medicare initiated the new Health Care Quality Improvement Program (HCQIP) to be implemented through its contractors, the Networks. The program, using data to identify important variations in processes of care and focusing on the provision of technical assistance to improve those processes, began with a meeting of the Federal partners with the renal community. The two-pronged approach of data and assistance worked. In 1993, only 43% of adult hemodialysis patients had a URR of 65 or above; but as reported in this report, by 2000 that figure rose to 89%. How did they do it? According to McClellan, et al., 2003:

First, full participation. The renal community and the Federal Government worked side by side from the start, collaborating and reaching agreement on the problems to be tackled and the methods to be employed. For example, a workgroup chose the initial indicators, seeking expert input and using available guidelines.

Second, the central role of uniform, annual data collection that helped to both highlight problem areas and track improvement over time. Frequent updates keep the renal community informed of progress and pitfalls, helping to mobilize their support and enthusiasm.

Third, the HCQIP is dynamic. When new guidelines were published, the existing structure was able to readily adapt and issue new performance measures.

Fourth, and finally, this project has demonstrated that it is possible to analyze large amounts of data and disseminate the results in a timely manner.

List of Measures

End Stage Renal Disease

Measure Title	*National*	*State*
Management of End Stage Renal Disease:		
Process: % of dialysis patients registered on a waiting list for transplantation	Table 1.15a	Table 1.15b (00)
Process: % of patients with treated chronic kidney failure who receive a transplant within three years of renal failure	Table 1.16a	Table 1.16b (97)
Outcome: % of hemodialysis patients with URR of 65 or greater	Table 1.17a (00)	Table 1.17b (00)
Outcome:% of patients with hematocrit of 33 or greater	Table 1.18a (00)	Table 1.18b (00)
Outcome: Patient survival rate	—	Table 1.19 (00)

Note: See Tables Appendix for tables listed above.

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Diabetes

Key Findings:

- Most people with diabetes get good quality care. Of people with known diabetes, 89% report getting their blood sugar checked, and 94% report getting their cholesterol levels checked.

- There has been progress in areas such as decreased hospital admission rates for uncontrolled diabetes. These rates were reduced by almost 30% between 1994 (40.7 per 100,000 population) and 2000 (28.5 per 100,000).

- Challenges remain in ensuring that people with diabetes have all recommended checkups (currently, 21% of people with diabetes are meeting this standard) and in reducing the rate of lower extremity amputations, which was unchanged from 1994 to 2000 (41.9 amputations per 100,000).

Background and Impact

Diabetes prevalence has risen in recent years, and this rise is projected to continue. Increases in the number of people with diabetes indicate that health status in America is changing, and the current health care system must respond in order to prevent and manage a disease that is manageable and preventable in some people. National statistics on diabetes highlight the challenge facing the United States:

- More than 17 million people—6.2% of the population—have diabetes. Of these, it is estimated that approximately 5.9 million people do not know that they have the disease. Moreover, the prevalence of diabetes is projected to increase 44% in the general population by 2020.[1]

- Diabetes was the sixth leading cause of death listed on U.S. death certificates in 1999.[2]

- Diabetes is the most frequent cause of blindness among working-age adults; the leading cause of nontraumatic lower extremity amputation and end-stage renal disease; and a principal cause of congenital malformations, perinatal mortality, premature mortality, and disability.[3]

- Diabetes has been linked to a range of other illnesses, in particular cardiovascular disease. People with diabetes are at increased risk for stroke, ischemic heart disease, peripheral vascular disease, and neuropathy.[4]

- The total cost of diabetes in America is estimated at $132 billion for 2002, of which nearly $91.8 billion is in direct medical costs, and nearly $40 billion is in indirect costs related to disability, work loss, and premature mortality.[5]

- Type 2 diabetes, which affects 90%-95% of people with diabetes, has been linked to the national increase in obesity. Type 2 diabetes increased 33% from 1990 to 1998.[6]

Diabetes and its complications often can be effectively managed with appropriate health care and patient self-management.[5,7] Because of the chronic nature of the disease, preventing complications associated with diabetes can have far-reaching effects. Moreover, because of its prevalence and the link between care and outcomes (including quality of life and work productivity), improving diabetes quality of care can have a marked effect on the health of the U.S. population.[8] High quality care for diabetes involves all the aspects of good health care: proper prevention, integration of different clinical specialties, effective provider-patient communication, and patients' self-management of their illness.

How the NHQR Measures Diabetes Quality of Care

The NHQR tracks a set of measures on the management of diabetes based on national consensus and standards and on evidence-based research (see Figure 6). These measures assess national performance in:

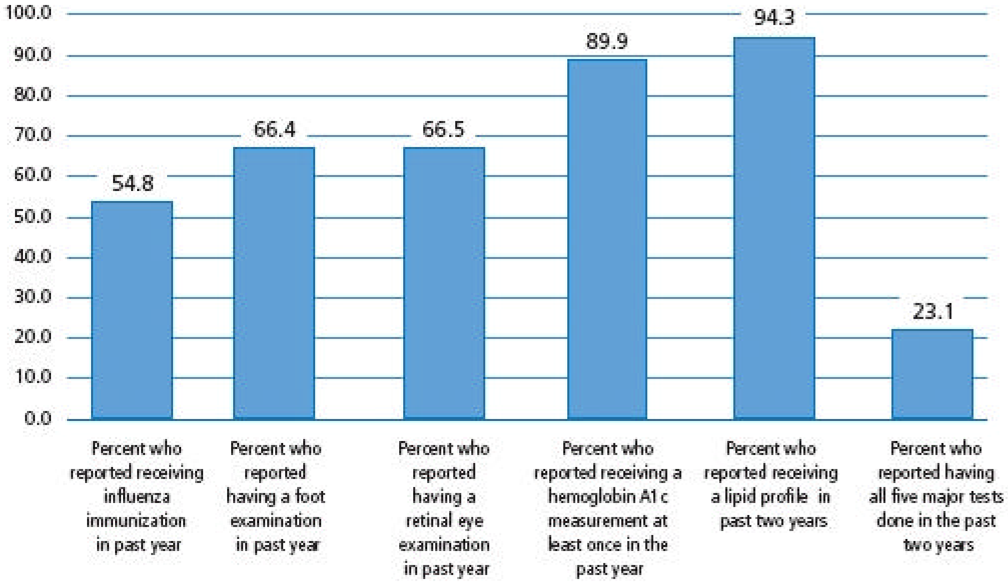
- Percentage of patients with diabetes who receive recommended tests and immunizations to help prevent complications associated with diabetes.

- Percentage of patients whose diabetes is effectively managed as indicated by the results of a variety of clinical tests.

- Rate of hospital admissions for uncontrolled diabetes and its complications. These measures help assess the adequacy of primary care that has been shown to reduce the need for hospitalization, but they may also be influenced by many other factors, including cultural and geographic factors and patient preferences.

The report includes measures that track how well we are doing nationally to ensure optimal care, i.e., the number of people with diabetes whose hemoglobin A1c levels are at an "optimal" level as defined by national guidelines. (A list of the included measures is presented at the end of this section.) This approach was arrived at after considerable consultation with diabetes experts and review of reference documents on measures from leading Federal and private organizations in the field of diabetes quality of care measurement. These organizations include:

Figure 6. Process measures of quality care for diabetes in adults age 18 and older, 2000



Source: Medical Expenditure Panel Survey (MEPS), 2000.

- National Institutes of Health, specifically the National Institute of Diabetes and Digestive and Kidney Diseases and the National Heart, Lung, and Blood Institute (NHLBI)
- National Diabetes Quality Improvement Alliance
- American Medical Association
- National Quality Forum
- Centers for Disease Control and Prevention, specifically the National Center for Health Statistics and National Center for Chronic Disease Prevention and Health Promotion
- Centers for Medicare & Medicaid Services

How the Nation Is Doing[i]

Receipt of Key Examinations and Immunizations

High quality of care for diabetes is based on ensuring that people with diabetes have needed tests that can help them and their providers manage their condition. All people with diabetes should obtain these services, which are relatively inexpensive to provide. The data presented below show that there is variability in the use of these services.

- Across the five "process" measures of care (annual retinal eye exams, annual influenza vaccinations, annual HbA1c checks, annual foot exams, and biannual lipid profiles), there is considerable variability in the delivery of services. Nearly half of all patients with diabetes do not receive a vaccination for influenza annually, and nearly one-third of diabetes patients did not have an eye or foot exam in the past year. At the same time, the vast majority of patients with diabetes receive important checks on their HbA1c levels and lipid profiles annually (89% and 94%, respectively, for the two measures). (MEPS, 2000)[ii]

- In 2000, 20.7% of patients reported having received all five major tests in the past 1 to 2 years (depending on the standard for the test) (MEPS, 2000).

Cutpoints for HbA1c Control

Decisions on whether to track minimally acceptable quality or optimal levels of quality of care must be based on the goal of the quality assessment effort.[9,10] In many areas of measurement within the report framework, there has been considerable development of two types of measurement standards: (a) "evidence-based practice guidelines" based on research findings, and (b) "performance measures" usually based on efforts to ensure health care provider accountability.[11] The use of different cutpoints in, for example, measuring HbA1c levels, highlights how national performance can be seen as very uneven. Figure 7 illustrates this using national data from the National Health and Nutrition Examination Survey (NHANES). For diabetes measurement in the first NHQR, an HbA1c level over 9.5% is considered poor control, under 9.0% is considered minimal control, and under 7.0% is considered optimal control.[12,13] While three-quarters of diabetes patients in America are receiving care that is helping them keep their HbA1c levels under minimally acceptable control, nearly two-thirds of diabetes patients do not meet optimal HbA1c levels.[iii]

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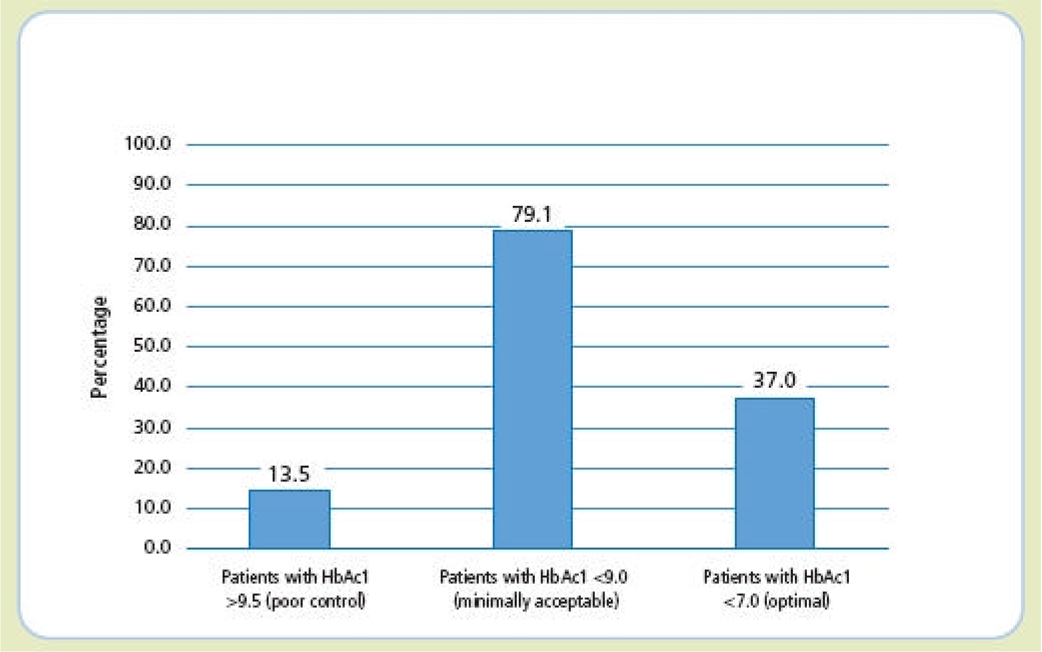
[i] Adjusting for known contributing factors, such as gender, age, and insurance status (multivariate analysis), would allow for more detailed exploration of the data, but this generally was not feasible for this report. Any adjustments that were done are noted in the detailed tables. The data presented in this report do not imply causation.

[ii] For the HbA1c Medical Expenditure Panel Survey measure, a large group of interviewees stated that they did not know whether they had received an HbA1c test in the past year. Additional information on this non-response is presented in the NHQR Tables Appendix.

[iii] For additional clarification on optimal cutpoints in HbAlc measurement, please see: National Institutes of Health/National Institute of Diabetes and Digestive and Kidney Diseases, member comments provided to the National Forum for Health Care Quality Measurement and Reporting during review of National Consensus Standards for Adult Diabetes Care (as referenced in Core Performance Measures for Adult Diabetes Care Member Comments document) and comments letter provided to National Healthcare Quality Report Federal Interagency Workgroup, meeting to review NHQR proposed final measure set, January 10, 2003.

Figure 7. Percentage of diabetes patients who have HbA1c under control, 1999–2000



Note: In the National Quality Forum consensus measure set on diabetes quality and in documentation from the National Diabetes Quality Improvement Alliance, the 7.0 clinical cutpoint is intended for management of an individual patient, while the 9.5 value is intended for looking at population data. New guidelines on control of HbA1c were under development during the development of the NHQR and will be reflected in future reports.

Hospital Admissions for Complications Associated with Diabetes

Opportunities for improvement are apparent when examining outcome measures such as hospital admissions for complications associated with diabetes. Although some admissions for diseases like diabetes are unavoidable for a variety of factors, in general, these admissions may reflect inadequate primary care and patient self-management. The analysis shows that, as a Nation, we are improving in the rate of hospital admissions for uncontrolled diabetes. Rates of such admissions were reduced by nearly 30% between 1994 (40.7 per 100,000 population) and 2000 (28.5 per 100,000) (HCUP, 2000).

However, the rate of admissions for lower extremity amputations has not changed between 1994 and 2000 (41.9 amputations per 100,000). This measure may reflect poor long-term management of diabetes (HCUP, 2000).

What We Don't Know

The management of comorbid conditions that develop with diabetes is a key area of concern for health care professionals and their patients. By tracking eye and foot screening as well as amputation rates, we have some measurement of how well the health system is doing in delivering care for the consequences of diabetes. We need to know more, however, about how well care is being delivered for other common conditions associated with diabetes.

Innovative approaches to the practices and integration of care for people with diabetes have been shown to improve their health in selected instances.[14,15,16,17] More information about how these practices can be implemented on a wider scale is needed.

Diabetes care is tracked by several national surveys, including among others the National Health Interview Survey, MEPS, the Behavioral Risk Factor Surveillance System, and NHANES, where both patient-reported information and physiological data from examinations are available. Estimates of the same measure can be different in these different surveys. Further examination of how results differ across the surveys and issues of validity and reliability of these different surveys in assessing diabetes care would offer clarity for researchers and policymakers tracking diabetes quality of care.

What Can Be Done

There is significant activity in the area of diabetes quality measurement at the national level in the United States. What is not entirely clear is how to translate this ever broadening consensus building on what is important to measure for diabetes quality into actual improvements in practice.

One area of activity is the effort to “drill down” into existing data to better understand why some areas of the country do better than others at delivering diabetes care. Future efforts should involve expanded examination of State and regional data. One such source is the Healthcare Cost and Utilization Project (HCUP), which builds a set of State and national databases that can be used to track a variety of quality measures. A first look at some State analysis for diabetes quality of care follows (see *State Variation in Admissions for Uncontrolled Diabetes Without Complications* and Figure 8).

A second area where work is being done to move from data to action in diabetes quality of care is the Translating Research Into Action for Diabetes (TRIAD) study. The TRIAD study is a multicenter prospective study that seeks to identify modifiable barriers to optimal diabetes care across diverse managed care settings. This multicenter observational study in 20002001 was run as a partnership between Federal and private sector partners that attempted to examine the structural and organizational characteristics of health systems and health care provider groups that affect quality of diabetes care.[18] Data and findings from the study are now being published.[19]

A third area where progress can be made is in comprehensive diabetes programs based on patient education. The National Diabetes Education Program (NDEP) is a federally sponsored initiative that involves public and private partners to improve treatment and outcomes for people with diabetes, promote early diagnosis, and prevent the onset of diabetes. NIDDK (a component of HHS's National Institutes of Health) and CDC's Division of Diabetes Translation jointly sponsor the program with the participation of more than 200 partner organizations. NDEP strategies include creating partnerships with organizations concerned about diabetes and the health status of their constituents and developing and implementing ongoing diabetes awareness and education activities and tools. One organization working with NDEP on improving diabetes care in the community is the Comprehensive Diabetes Control Program run by the Michigan Department of Community Health (see Figure 9). This "best practice" in diabetes care is highlighted in the Assistant Secretary for Health's Best Practice Initiative. In addition, CMS selected improvement of diabetes care as a priority for its QIOs in each State starting in 1999.

State Variation in Admissions for Uncontrolled Diabetes Without Complications[iv]

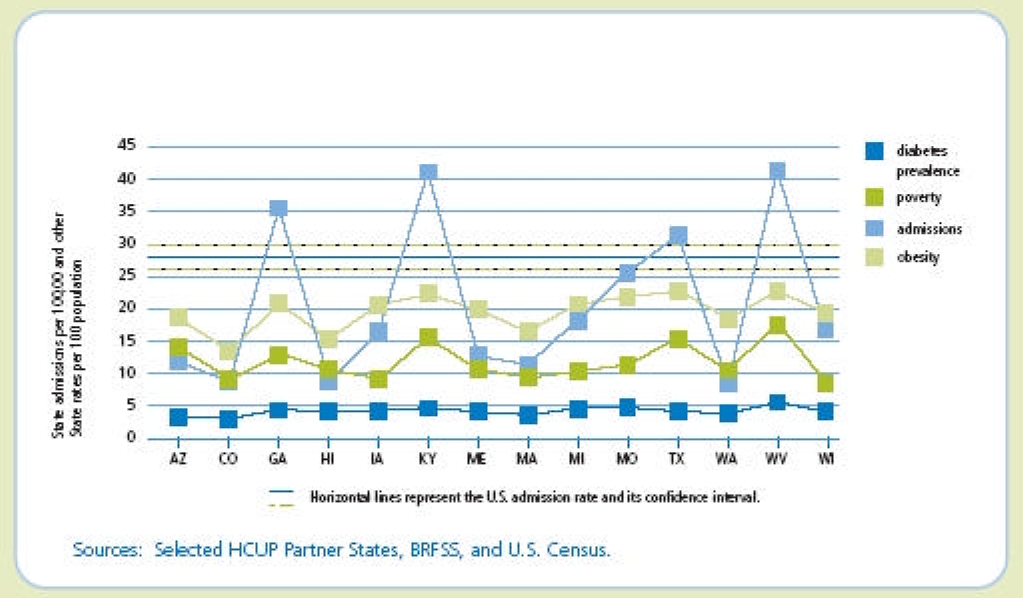
Adult admissions for uncontrolled diabetes without acute or long-term complications vary across the Nation. In preparing for the next national report, several States shared, in advance, their rates of admission for uncontrolled, uncomplicated diabetes, which represent potentially preventable hospitalizations. While this is not a complete or random sample of States, the admission rates shown in Figure 8 differ by almost five times from the lowest to the highest among these States. The States shown are part of AHRQ's Federal-State-Industry partnership, known as the Healthcare Cost and Utilization Project , which combines States' hospital discharge records into a uniform database to make such insights possible. The U.S. rate is based on the Nationwide Inpatient Sample, a sample of hospitals from 28 HCUP States weighted to a national estimate.

What causes differences among the States in these potentially preventable hospitalizations? Some patterns can be seen between uncontrolled diabetes admissions and selected environmental and behavioral risk factors as shown in aggregate State-level statistics in the chart to the left. For example, States with higher admission rates for uncontrolled, uncomplicated diabetes also have higher rates of obesity and poverty. These States also have higher diabetes prevalence, meaning more State residents with known diabetes.

However, given the wider variation in hospital admissions, other factors may contribute. These may include levels of access to health care professionals, emergency rooms, and hospital beds; availability of health insurance coverage; differences in diabetes management within ambulatory care settings, such as success in monitoring glycemic control, and adjustments about when to hospitalize; readmissions due to no or ineffective patient education programs; patient compliance with treatment regimens and patient knowledge about the warning signs of the disease, importance of diet and exercise, potential complications, and when to consult a doctor. Also, HCUP relies on State-specific data collection methods, which may contribute to the differences.

[iv] HCUP Partners providing their data for this example are: Arizona Department of Health Services, Colorado Health & Hospital Association, Georgia Hospital Association, Hawaii Health Information Corporation, Iowa Hospital Association, Kentucky Department for Public Health, Maine Health Data Organization, Massachusetts Division of Health Care Finance and Policy, Michigan Health and Hospital Association, Missouri Hospital Association, Texas Health Care Information Council, Wisconsin, Department of Health and Family Services, Washington State Department of Health, West Virginia Health Care Authority.

Figure 8. Uncomplicated, uncontrolled diabetes admission rates and related factors by State, 2000



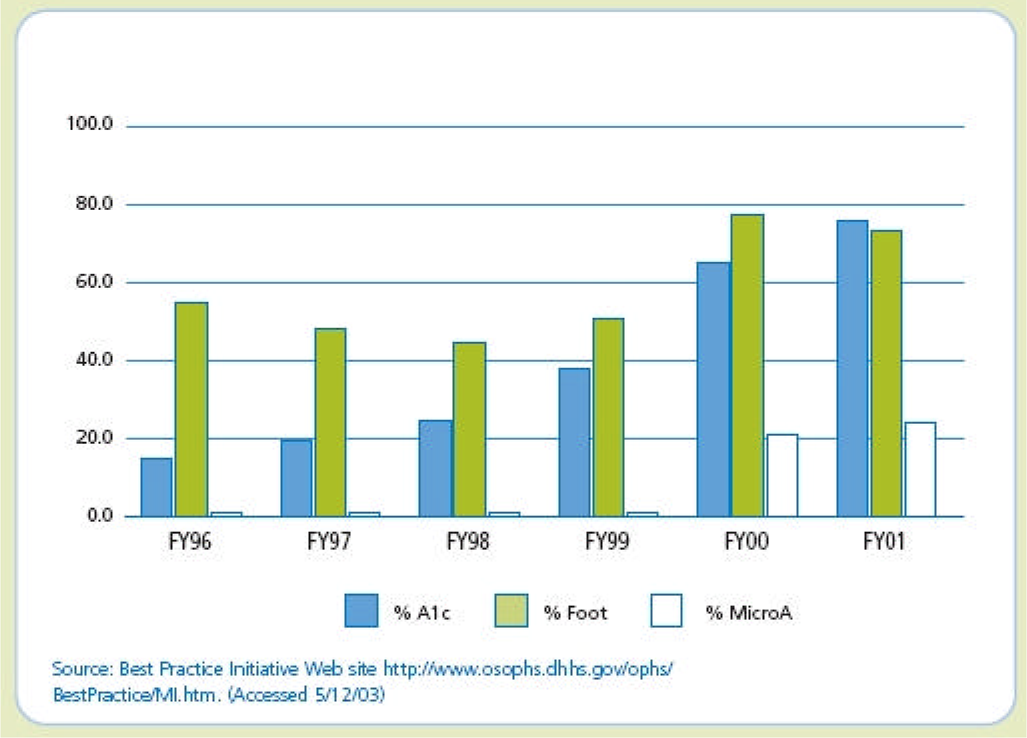
Sources: Selected HCUP Partner States, BRFSS, and U.S. Census.

Figure 9. Michigan Comprehensive Diabetes Control Program

In 1995, Michigan completed the establishment of a Statewide network of six regional Diabetes Outreach Networks (DONs). The DON mission is to increase innovative partnerships to strengthen diabetes prevention, detection, and treatment throughout Michigan.

Results from the Michigan DON demonstrate that working with health care agencies and providers through a Statewide Diabetes Care Improvement Project can result in improved outcomes for people with diabetes. Trends in followup data from FY 1996 through FY 2001 for HbA1c measurement, foot exams, and microalbuminuria (all done at least once annually) show a significant improvement in the number of people with diabetes having these tests done (see Figure 10). Moreover, individualized data analysis from the regional DONs also shows a positive downward trend in the levels of glycosylated hemoglobin.

Figure 10. Follow-up trends



Source: Best Practice Initiative Web site http://www.osophs.dhhs.gov/ophs/BestPractice/MI.htm. (Accessed 5/12/03)

List of Measures

Diabetes

Measure Title	*National*	*State*
Management of diabetes:		
Process: % of adults with diabetes who had a hemoglobin A1c measurement at least once in past year	Table 1.20a (00) Table 1.20b	Table 1.20c (01)
Process: % of patients with diabetes who had a lipid profile in past two years	Table 1.21(00)	—
Process: % of adults with diabetes who had a retinal eye examination in past year	Table 1.22a (00)	Table 1.22b (01)
Process: % of adults with diabetes who had a foot examination in past year	Table 1.23a (00)	Table 1.23b (01)
Process: % of adults with diabetes who had an influenza immunization in past year	Table 1.24a (00)	Table 1.24b (01)
Outcome: % of adults with diagnosed diabetes with HbA1c level >9.5% (poor control); <7.0 (optimal);<9.0 (minimally acceptable)	Table 1.25	—
Outcome: % of adults with diagnosed diabetes with most recent LDL-C level <130 mg/dL (minimally acceptable); <100 (optimal)	—	—
Outcome: % of adults with diagnosed diabetes with most recent blood pressure <140/90 mm/Hg	Table 1.26	—
Outcome: Hospital admissions for uncontrolled diabetes per 100,000 population	Table 1.27 (00)	—
Outcome: Hospital admissions for short-term complications of diabetes per 100,000 population	Table 1.28 (00)	—

Diabetes

Measure Title	*National*	*State*
Management of diabetes (cont.)		
Outcome: Hospital admissions for long-term complications of diabetes per 100,000 population	Table 1.29 (00)	—
Outcome: Hospital admissions for lower extremity amputations in patients with diabetes per 1,000 population[v]	Table 1.30 (00)	—

Note: See Tables Appendix for tables listed above.

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[v] This measure is one where two comparable national data sources exist, the National Hospital Discharge Survey and the Healthcare Cost and Utilization Project. Both data sources present information on potentially preventable hospital admissions with some slight variation in the measure specifications for individual measures. This report relied on Healthy People 2010 measure specifications to determine which data source should be used in the report for individual measures. More information is available in the Measures Specifications Appendix. More information on the NHDS is available at http://www.cdc.gov/nchs/about/major/hdasd/nhds.htm. More information on HCUP and the AHRQ Quality Indicators is available at www.ahrq.gov/data/hcup and www.qualityindicators.ahrq.gov, respectively.

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Heart Disease

Key Findings:

- Rates for blood pressure screening are 90%, and rates are greater than 80% for cholesterol screening in adults 45 or older. However, only about 25% of people with hypertension have it under control.
- Sixty-two percent of smokers who had a routine office visit reported that their doctors had advised them to quit, although less than half of acute heart attack patients who smoke are counseled to quit while in the hospital (42%).
- For heart attack patients, 69% get recommended beta blockers at admission, and 79% are prescribed this therapy at discharge.
- While the national average for administration of angiotensin-converting enzyme (ACE) inhibitors to heart attack patients is 71%, performance in some States is as high as 90%.

Background and Impact

Heart disease is a complex of diseases of the cardiovascular system that includes heart attack and heart failure. Despite the impressive advances in treating and preventing heart disease in recent years, heart disease remains the leading cause of death, accounting for more than 700,000 deaths in 2000 and costing more than $214 billion each year.[1,2,3] Research, clinical practice, and public awareness have led to significant behavior changes among both medical professionals and the general population over the last few decades.[4,5,6,7] The development and widespread use of new drugs, surgeries, and devices, such as pacemakers, have reduced mortality and improved care for those with heart conditions.[8,9]

Progress has also been made in prevention of heart disease. The rate of smoking in adults has decreased, the rate of cholesterol screening has increased, and most people with hypertension are aware of their condition, due in part to programs like the HHS/NIH National Cholesterol Education Program. Such steps have helped to cut in half the mortality rate from heart attacks over the last four decades [9,10,11,12,13,14,15,16, 17,18,i] People not only survive heart attacks that would have killed them in the past, but they live longer and healthier lives afterwards with appropriate treatment and lifestyle changes.

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[i] While cardiac mortality is still on the decline in the United States, the rate of decline may have slowed. See Cooper, et al. Trends and disparities in coronary heart disease, 3137.

Some people are more likely to develop heart disease than others because they have certain risk factors, including medical conditions and unhealthy behaviors that make them more vulnerable. Some of these risk factors are modifiable and can be ameliorated by treatment or behavior changes. Modifiable risk factors for heart disease are:

- **High blood pressure (or hypertension).** High blood pressure is at epidemic levels among Americans. About 50 million American adults— one in four—have hypertension and the risk of developing it increases with[19,20] One-third of those affected do not know they have it.[21,22,23,ii] Of those currently under treatment, approximately 35% have their blood pressure under control.[24,25,26,27] Antihypertensive drugs—such as diuretics, beta-blockers, ACE inhibitors, and calcium channel blockers—are available to meet the needs of patients,[28,29,iii] and national screening guidelines for hypertension are well established.[30,31]

- **High cholesterol (or hyperlipidemia).** This condition affects more than 65 million Americans and is more prevalent in older age groups.[32,iv] Studies have shown that the higher the level of blood cholesterol, the greater the risk of heart disease.[5,33,34] Updated national screening and treatment guidelines were released by the HHS/NIH Adult Treatment Panel III of the National Cholesterol Education Program in 2001.

- **Smoking.** Although smoking rates have come down, smoking is still the leading cause of preventable death.[34,35]

- **Obesity and lack of exercise.** In 1999-2000, it was estimated that 30% of American adults (or 59 million people) were overweight.[36] Maintaining a healthy body weight, exercising regularly, and eating a balanced diet have been shown to help reduce both blood pressure and cholesterol levels.[37,38] Studies have shown impressive reductions in risk for those who change poor habits to healthy ones.[39]

[ii] Given that elevated blood pressure is asymptomatic, it is not surprising that this is the case. See Alderman, et al. Hypertension guidelines, 917-23.

[iii] In addition, the Agency for Healthcare Research and Quality has released an Evidence Report that summarizes published scientific findings on ambulatory and self-measured blood pressure monitoring. Prepared by ARHQÅfs Evidence-based Practice Center at Johns Hopkins University, the report provides updated evidence-based information for clinicians on the most effective way to target therapies. See Appel L, Robinson K, Guallar A. Utility of blood pressure monitoring outside of the clinical setting. Evidence Report/Technology Assessment No. 63. Rockville, MD: Agency for Healthcare Research and Quality; 2002.

[iv] The updated Adult Treatment Panel III (ATP III) guidelines released in 2001 by the National Cholesterol Education Program III expand the number of Americans eligible for cholesterol lowering lifestyle intervention to 62 million from the previous 52 million under earlier guidelines, and the number eligible for drug treatment to 36 million from the previous 13 million.

- **Diabetes.** More than 17 million people (6.2% of the population) have diabetes, and minorities are more likely to develop the disease than whites. Prolonged periods of hyperglycemia (high blood sugar) are associated with both microvascular and macrovascular disease.[40,v] In addition, people with diabetes often also have elevated cholesterol levels. They can sometimes reduce their risk of heart disease by using lipid-lowering medications early in their disease.[41,42]

- **Chronic kidney disease.** Half of all ESRD patients die of heart disease, and 40% of them have it when they begin dialysis. This is due to risk factors common to both conditions, as well as to an independent effect of CKD on arteriosclerosis.

Some factors that make people more susceptible to heart disease, including aging or a genetic predisposition for heart disease, are not modifiable.[43]

Some forms of heart disease account for the majority of heart disease morbidity and mortality,[13,14] including:

- **Acute myocardial infarction (AMI).** AMI, or heart attack, is when the blood flow to the heart becomes severely reduced or completely blocked off, and little or no oxygen can get to the heart muscle, causing various levels of damage.

- **Heart failure, including congestive heart failure (CHF).** Heart failure occurs when the heart muscle is too weak to adequately pump blood for the body's metabolic needs.[44] Such impairment can result in a lack of adequate blood flow to vital organs, including the brain, kidney, and other organs, as well as a backup of fluid into the lungs. Often, heart failure is caused by damage to the heart muscle from a heart attack, which can seriously weaken the left ventricle, the main pumping chamber of the heart. It appears more frequently in old age: more than 5 million people, primarily the elderly, suffer from CHF, which is associated with a high rate of hospitalization. CHF is the most frequent discharge diagnosis for Medicare beneficiaries.[45,46] Treatment of CHF is also one of the single most expensive items in the Medicare budget, accounting for $12 billion in annual costs.[47]

- **Cardiac arrhythmias.** This is a group of conditions in which the normal heart rhythm is disturbed, sometimes resulting in an impaired ability to pump blood throughout the body. Most of these conditions are associated with preexisting coronary heart disease, and they are responsible for sudden cardiac death, estimated at about 37,000 deaths annually in the United States.[48,49,50]

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[v] Cardiovascular diseases are the cause of death for approximately 65% of diabetics. See Grundy, et al. Diabetes, 1134-1146.

How the NHQR Measures Heart Disease Quality of Care

There is a body of knowledge about providing high quality care to patients with heart disease and people at risk for developing it. There are well-established practices in the areas of prevention and treatment, with corresponding core consensus-based measures currently tracked at the national and State levels. These measures track care in both primary care settings and hospitals, the latter offering greater opportunities to exercise control over and record patient behavior. Some of these same measures have been used successfully in national quality improvement efforts as part of Medicare's QIO program.

The report tracks a number of measures in heart disease quality of care. Some are prevention measures, such as screening for high cholesterol and blood pressure and smoking cessation counseling. Some are measures of treatment quality such as blood pressure control and AMI and heart failure treatment. Antihypertensive medication can reduce high blood pressure.[32,51,vi] Similarly, a class of drugs known as statins can help to reduce high choles-terol.[52,53] Together, drugs and dietary measures help reduce blood pressure, prevent plaque and clots from forming in the arteries, and prevent heart disease from developing in the first place. Timely administration of both aspirin and beta-blockers upon hospital admission (assuming the patient does not have any contraindications), as well as prescribing these medications when the patient is released, may help reduce morbidity and mortality from AMI.

The measures for AMI and heart failure rely on Medicare data and, as such, track treatment for Medicare beneficiaries only. However, they illustrate the quality of care provided to the population that is at high risk for AMI and heart failure.

How the Nation Is Doing[vii]

Data from this section come from a variety of sources, including medical record abstractions completed for Medicare's QIO national improvement effort and representative national surveys of the general population.[viii]

Prevention

The rate of blood pressure screening among adults is 90%, but rates for cholesterol screening and smoking cessation counseling (both during routine office visits and in the hospital) are lower. Blood pressure screening, cholesterol screening, and smoking cessation counseling vary

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[vi] The NIH recently concluded the ALLHAT (Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack Trial), and found that while all of the drugs helped to significantly lower blood pressure, diuretics were by far the most effective and the least expensive of the available options. See The Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack Trial (ALLHAT), Major outcomes, 2981-97.

[vii] Adjusting for known contributing factors, such as gender, age, and insurance status (multivariate analysis) would allow for more detailed exploration of the data, but this generally was not feasible for this report. Any adjustments that were done are noted in the detailed tables. The data presented in this report do not imply causation.

[viii] Note that data from the Medicare QIO national improvement efforts apply only to the Medicare population.

significantly by age, race, and sex, suggesting that there is room for improvement. For example, there is a difference of almost 20 percentage points between States with the highest and lowest rates of smoking cessation counseling (80% vs. 62%).

- **Blood pressure screening.** Because hypertension is often without symptoms, patients may have it for years and be completely unaware. It also can worsen over time if untreated. Therefore, screening should begin at an early age (18) and continue regularly so that doctors and patients can take immediate steps to address any significant increase. Ninety percent of Americans reported having their blood pressure checked in the past 2 years. Ninety-three percent of women and 92% of older adults get checked most often, as do blacks at 90%. Hispanics are screened at lower rates than any other racial/ethnic group (84%) (NHIS, 1998).

- **Cholesterol screening.** Rates of screening have increased in the last two decades. According to 1998 NHIS data, 67% of adults had their cholesterol checked in the past 5 years. More than 80% of adults aged 45 or older had their cholesterol checked.

- **Counseling smokers to quit (during routine office visits).** Smoking is the single most important modifiable risk factor for heart disease. In 2000, 62% of smokers who had a routine office visit reported that their doctors had advised them to quit. Those who report poor to fair health are more likely to be counseled to quit (75%) than those who report good to excellent health (58%) (NHIS, 2000).

- **Counseling hospitalized heart attack patients to quit smoking.** Less than half of AMI patients who smoke are counseled to quit while in the hospital (42%). Of these patients, those who are counseled to quit while in the hospital are more likely than those counseled in other settings to still be abstinent from smoking a year later (MEPS, 2000). States vary widely in their rates of counseling (Medicare QIO, 2000-2001).

Treatment

Approximately 85% of AMI patients are administered aspirin upon hospital arrival;[54,ix] rates for other treatments studied in this report are lower (see list of measures at end of this section). Breakthroughs have been made in the treatment of heart disease over the last four decades, and the clinical community is knowledgeable about these interventions.

[ix] The need for administration of aspirin goes beyond recent heart attack patients, and extends to heart disease patients more generally. A recent study at an AHRQ-sponsored Center for Education and Research on Therapeutics showed that while over 80% of patients with heart disease take aspirin, those who don't are more likely to have comorbidities, such as diabetes or hypertension. Those who didn't take aspirin had twice the risk of dying. See Califf, et al, in the March 2002 American Journal of Cardiology.

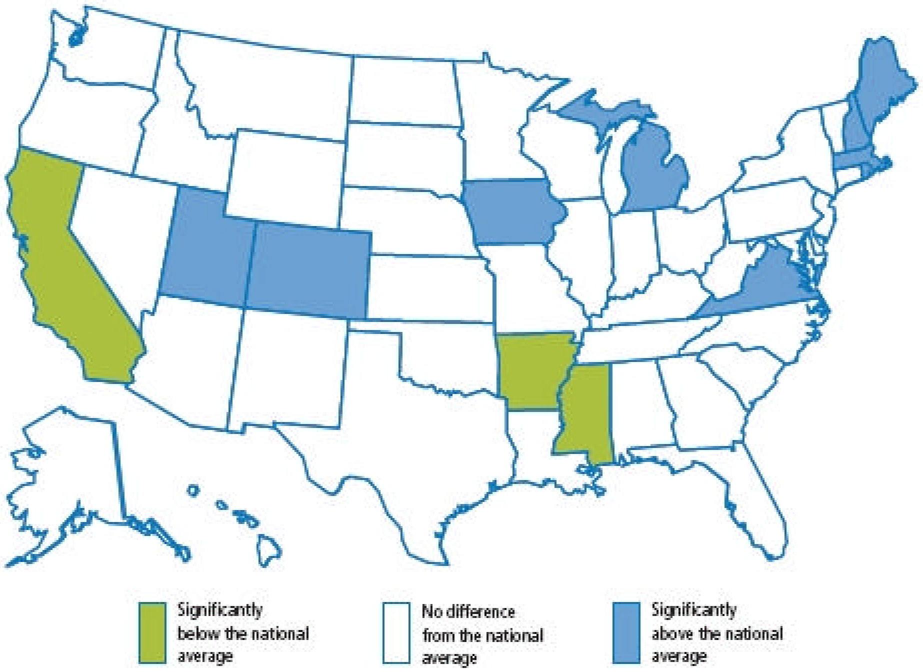
Acute Myocardial Infarction

- **Use of aspirin.** Unless contraindicated, aspirin should be given within 24 hours of admission for a heart attack and prescribed to heart attack patients when they leave the hospital. Eighty-five percent of heart attack patients are prescribed aspirin upon admission and at discharge. The national rate for both of these therapies is 85%, but women and the most elderly patients get these therapies least often. States show significant variation in early administration of aspirin after a heart attack, ranging from 69% to 92% (Medicare QIO, 2000-2001).

- **Use of beta-blockers.** Unless contraindicated, beta-blockers should be administered within 24 hours of hospital admission for the attack and prescribed when the patient leaves the hospital. The national rates are 69% and 79%, respectively, and there is variation among States on both measures, ranging from 60% to 90%. Women and the most elderly patients get these therapies less often than other groups (Medicare QIO, 20002001).

The map presented in Figure 11 illustrates the Nation’s performance in prescribing beta-blockers for heart attack patients when they leave the hospital. Chosen in 1992 as a national priority for improvement by the Medicare QIO program, the national rate rose for Medicare patients from 21% of eligible patients in the early 1990s[55] to its current level of 79%.

Figure 11. Percent of AMI patients with beta-blocker prescribed at discharge



Source: Centers for Medicare & Medicaid Services, Quality Improvement Organization (QIO) program.

Management of Heart Failure

Two of the three measures in this report track management of heart failure treatment: evaluation of left ventricular ejection fraction, which assesses function of the part of the heart critical to efficient pumping; and the administration when appropriate of angiotensin-converting enzyme (ACE) inhibitors at discharge.[56] National rates for these two measures are 69% and 71% respectively. State variations exist for both of these measures, ranging from 40% to 90% (Medicare QIO, 2000-2001).

Hypertension

Some people with known high blood pressure may not be under treatment.[57] For those treated, about 53% have their blood pressure under control.[58] About 23% of individuals with hypertension have their blood pressure under control. Middle-aged adults have slightly higher rates of blood pressure control (33%) than younger adults (NHANES, 1999-2000).

Congestive Heart Failure

From 1998 to 2000, there has been no change in the pattern of hospitalization for CHF, with more than 500 people per 100,000 admitted to hospitals for CHF in 2000. Some proportion of these hospitalizations may be avoidable[x] (NHDS, 2000).

What We Don't Know

The evidence base for performance measurement in heart disease is well developed although gaps exist. There is research behind a variety of tested and often cost-effective interventions. Much remains to be learned about the quality of care for heart disease and variations among subgroups and States.

Prevention

Providers can influence patients to quit smoking. Yet almost 60% of heart attack patients who smoke do not get this smoking cessation counseling in the hospital (Medicare QIO, 2000-2001), and about 40% of smokers report not being counseled in the primary care setting (MEPS, 2000). Only 67% of adults report screening for cholesterol. It is not clear why smoking cessation counseling and cholesterol screening rates are not higher.

Treatment

Breakthroughs in treatment of heart disease have enabled more heart patients to survive a heart attack and live well long after having one. Heart failure patients benefit from therapies that allow them to live with reduced heart function. Yet some of these treatments are not being administered to all those who can benefit from them. Older people and women are less likely to receive these therapies. The reasons for this are not clear.[59,xi]

More information is needed on the reasons why some patients treated for hypertension do not have their blood pressure under control. Some physicians are not aware of the recommendations on screening and treatment of hypertension put forth by the Seventh Joint National Committee on Prevention, Detection, and Treatment of High Blood Pressure.[60] This lack of knowledge might be attributable to the complexity of the guidelines, and some authors have suggested making the guidelines easier to follow.[22] In addition, the recommended lifestyle modifications—weight loss and exercise—are among the hardest behaviors for physicians to influence.[22] Finally, patient compliance with recommended drug therapies may be low due to side effects and complicated dosing schedules.[27]

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[x] For example, a recent study found that some antihypertensive medications may also improve left ventricle functioning, a critical factor in the development of congestive heart failure. See Bella JN, Palmieri V, Roman MJ, et al. Mitral ratio of peak early to late diastolic filling velocity as a predictor of mortality in middle-aged and elderly adults: the Strong Heart Study. Circulation 2002;105(16):1928-33.

[xi] A study published in 2000 revealed that Medicare beneficiaries in both managed care and fee-for-service received coronary angiography less often than recommended, and that increasing age was associated with lower rates of the procedure, one that helps to reduce cardiac deaths. See Guadagnoli, et al, Appropriateness of coronary angiography, 1460-1466.

What Can Be Done

Efforts are being made in research and development of new therapies to continually improve cardiac care. NHLBI has made decade-long efforts to reduce coronary heart disease morbidity and mortality through education programs such as the National Cholesterol Education Program, National High Blood Pressure Education Program, and National Heart Attack Alert Program. NHLBI has also mounted community-based programs, called Enhanced Dissemination and Utilization Centers, to promote the application of science-based prevention and reduce cardiovascular risk. CDC has also addressed mortality and morbidity from heart disease with a multipronged approach: programmatic assistance to States, coordination of an action plan with public health agencies, and the use of data to monitor the Nation's progress, particularly among racial and ethnic groups. Progress is being realized under the State assistance program, where CDC funded 29 States and the District of Columbia to focus on such interventions as getting people to emergency care quickly and lowering blood pressure and cholesterol.[61] Below are several examples of State activities under this initiative:

- Wisconsin's Cardiovascular Health Program,[62] established in October 2000, uses a comprehensive approach to help Wisconsin communities reduce the incidence and burden of cardiovascular disease and stroke. Goals of the initiative include developing and coordinating programs with health care partners and community and advocacy groups to reduce risk factors, with a focus on heart healthy policies and physical and social environmental changes.[62]

- Arkansas, spurred by its ranking as the State with the fifth highest rate of heart disease mortality in the country, engaged the Arkansas Wellness Coalition, a coalition of public and private health agencies and organizations, to improve residents' health. Through implementation of peer-reviewed guidelines by practitioners, Arkansas hopes to raise the standard of cardiac care throughout the State.[63]

- In a similar fashion, Maine's Cardiovascular Health Program is addressing heart disease through coalitions that emphasize the implementation of guidelines, train health care providers, and provide community-based support programs.[63]

- Missouri ranks second among States in the Nation in deaths due to coronary heart disease. Through the Missouri Cardiovascular Health Program, the State has created partnerships to address the needs of patients with cardiovascular disease, diabetes, and hypertension. By tapping into Federally Qualified Health Centers, it reaches the minority populations who disproportionately suffer from these conditions.[63]

- South Carolina's Cardiovascular Health Program funds eight local communities to focus on promoting public awareness of and participation in activities that reduce morbidity and mortality from heart disease and stroke in the African American community. One of the districts is working closely with faith-based organizations to engage the local community in programs to promote smoking cessation, exercise, and proper nutrition.[63]

- Ten Detroit-area hospitals use a simple tool kit to help remind health care professionals and patients to make use of all of the tests and treatments recommended in national guide-lines.[64] Among other things, the tool kit contains reminders, standard orders for medications and tests, checklists, and educational programs. Items on the tool kit's checklist include, for example, administering aspirin and clot-busters soon after a heart attack and the use of recommended drugs like ACE inhibitors and beta-blockers. Through the use of this tool kit, the rate at which patients receive key treatments has approached 90 percent in some hospitals.[64]

Recent studies reveal that specific, cost-effective methods can be successfully implemented to improve heart disease processes and outcomes. For example, researchers have found that heart attack patients have improved outcomes if they are treated by a cardiologist (either alone or in combination with a primary care doctor) rather than by a primary care doctor alone[12,65,66,67,68,69,xii,xiii]

The National Committee for Quality Assurance (NCQA) has instituted a program to recognize physicians who deliver high quality cardiovascular and stroke care through its new Heart/Stroke Recognition Program.[47]

Efforts are also being made to improve public awareness of heart disease. For example, according to the National Registry of Myocardial Infarction 2 Study, one-third of hospitalized AMI patients did not have chest pain symptoms. These patients were more likely to delay going to the hospital compared with patients who did have chest pain, and these patients were also less likely to receive critical therapies such as aspirin within the first 24 hours of admission.[70] Raising the public profile of heart disease can help to educate both patients and practitioners about steps they can take to improve treatment and outcomes. For example, a recent study showed that one-third of heart attack patients who do not have typical chest pain delay going to the hospital and, therefore, are less likely to have critical therapies.[71] Alerting the public, including providers, to these kinds of facts can prompt people to take action when needed and initiate discussions with their doctors.

[xii] This may be related to findings from a June 2001 study in the Journal of General Internal Medicine, Vol. 16 pp. 351-359, by Majumdar SR et al. These researchers found that generalists were less likely than were cardiologists to use thrombolytics and aspirin for heart attack patients.

[xiii] Improvement in patient treatment and outcomes due to specialist involvement should be seen along a continuum of lesser to greater involvement, rather than as an either/or proposition, according to Ayanian et al. in an article in the American Journal of Medicine, February 15, 2000.

List of Measures

Heart Disease

Measure Title	*National*	*State*
Screening for high blood pressure:		
Process: % of people age 18 and over who have had blood pressure measured within preceding 2 years and can state whether their blood pressure is normal or high	Table 1.31 (98)	—
Screening for high cholesterol:		
Process: % of adults 18 and over receiving cholesterol measurement within 5 years	Table 1.32a (98)	Table 1.32b (01)
Counseling on risk factors:		
Process: % of smokers receiving advice to quit smoking	Table 1.33a (00)	Table 1.33b (01)
Treatment of AMI:		
Process: % of AMI patients administered aspirin within 24 hours of admission	Table 1.34a	Table 1.34b
Process: % of AMI patients with aspirin prescribed at discharge	Table 1.35a	Table 1.35b
Process: % of AMI patients administered beta blockers within 24 hours of admission	Table 1.36a	Table 1.36b
Process: % of AMI patients with beta blockers prescribed at discharge	Table 1.37a	Table 1.37b
Process: % of AMI patients with left ventricular systolic dysfunction prescribed an ACE inhibitor at discharge	Table 1.38a	Table 1.38b
Process: % of AMI patients given smoking cessation counseling while hospitalized	Table 1.39a	Table 1.39b
Process: Median time to thrombolysis. Time from arrival to initiation of a thrombolytic agent in patients with ST segment elevation or left bundle branch block (LBBB) on the electrocardiogram (ECG)	Table 1.40a	Table 1.40b

performed closest to hospital arrival time.

Heart Disease

Measure Title	*National*	*State*
Treatment of AMI (cont.)		
Process: Median time to PTCA. Median time from arrival to percutaneous transluminal coronary angioplasty (PTCA) in patients with ST segment elevation or left bundle branch block (LBBB) on the electrocardiogram (ECG) performed closest to hospital arrival time.	Table 1.41a	Table 1.41b
Treatment of acute heart failure:		
Process: % of heart failure patients having evaluation of left ventricular ejection fraction	Table 1.42a	Table 1.42b
Process: % of heart failure patients with left ventricular systolic dysfunction prescribed an ACE inhibitor at discharge	Table 1.43a	Table 1.43b
Management of hypertension:		
Outcome: % of people with hypertension who have blood pressure under control	Table 1.44a (99-00) Table 1.44b (88-94)	—
Management of CHF:		
Outcome: Hospital admissions for congestive heart failure (CHF) per 1,000 population[xiv]	Table 1.45a (NHDS00) Table 1.45b (NHDS99) Table 1.45c (NHDS98)	—

Note: See Tables Appendix for tables listed above.

[xiv] This measure is one for which two comparable national data sources exist—the National Hospital Discharge Survey and the Healthcare Cost and Utilization Project. Both data sources present information on potentially preventable hospital admissions with some slight variation in the measure specifications for individual measures. This report relied on Healthy People 2010 measure specifications to determine which data source should be used in the report for individual measures. More information is available in the Measure Specifications Appendix. More information on the NHDS is available at http://www.cdc.gov/nchs/about/major/hdasd/nhds.htm. More information on HCUP and the AHRQ Quality Indicators is available at www.ahrq.gov/data/hcup and www.qualityindicators.ahrq.gov, respectively.

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HIV and AIDS

Key Findings:

- National performance is improving in preventing new AIDS cases and in preventing deaths due to AIDS.
- Exceptions to this progress exist for certain age groups and among certain minority groups. Compared to the national average, new AIDS cases are 31% higher in adults ages 18 to 44, and 76% higher in black, non-Hispanic adults.

Background and Impact

More than 20 million people have died worldwide since 1981 of human immunodeficiency virus (HIV) infection and its complications.[1] In the United States, the impact of and response to HIV and acquired immune deficiency syndrome (AIDS) have been widespread:

- CDC estimates that 850,000 to 950,000 people are living with HIV infection, and one-quarter of these people are unaware of their infection.[2]
- Approximately 40,000 new HIV infections occur each year in the United States, about 70% among men and 30% among women. Of these newly infected people, half are younger than 25.[3,4]
- As of December 31, 2001, 467,910 deaths among people with AIDS had been reported to the CDC.5 AIDS is currently the fifth leading cause of death in the United States among people aged 25 to 44.[6]
- The President's Emergency Plan for AIDS Relief will commit $15 billion over the next 5 years to address the AIDS crisis worldwide.

Progress has been made in the past 10 years in developing drugs to fight both HIV infection and its associated complications, such as opportunistic infections and cancers.[7,8,9,10]

How the NHQR Measures HIV and AIDS Quality of Care

HIV infection progressively destroys the body's ability to fight infections and certain cancers by killing or damaging cells of the body's immune system. The HIV to AIDS continuum begins with a new HIV infection and, especially if untreated, usually proceeds to a new AIDS case.[i,5]

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[i] The term AIDS applies to the most advanced stages of HIV infection. CDC developed official criteria for the definition of AIDS and is responsible for tracking the spread of AIDS in the United States. CDCÅfs definition of AIDS includes all HIV-infected people who have fewer than 200 CD4 positive T cells (abbreviated CD4+ T cells) per cubic millimeter of blood. Healthy adults usually have CD4 positive T-cell counts of 1,000 or more. In addition, the definition includes 26 clinical conditions that affect people with advanced HIV disease. Most of these

Several important caveats must be considered when assessing national progress in the quality of HIV and AIDS care. Changes in HIV infection rates are a reflection of behavioral changes in at-risk individuals, i.e. personal behavior, which are only partly influenced by the health system's ability to effect change. Individual and community-based intervention programs emphasize condom use and safe sex practices.11,12 ,13 Changes in the incidence of new AIDS cases are partially affected by whether patients get appropriate treatment for HIV infection.

Although a cure for HIV infection has not been identified, current drug therapies are sometimes able to reduce the amount of virus in an infected individual's body, resulting in better prognosis for HIV patients today versus 10 years ago.

The twofold goal of the health system in providing quality services for HIV and AIDS is:

- To prevent new HIV and AIDS cases, and
- To delay deaths due to AIDS.

How the Nation Is Doing[ii]

Nationwide, progress is being made in controlling the AIDS epidemic. Performance is improving in reducing new AIDS cases and AIDS mortality, although new data presented below show some increase in AIDS incidence rates. The appearance of new drugs— protease inhibitors—in 1995 and 1996 has contributed to this progress. In addition to drug therapies, progress has been made in HIV testing products and procedures that address the problem of the 200,000 people unknowingly infected with the virus.

- New AIDS cases, or AIDS incidence rates, climbed rapidly from the early 1980s and peaked in the early 1990s.[3]
- The number of new AIDS cases decreased by 8.5% between 1998 and 2000. However, very recent data reflect a 2.2% increase in the AIDS incidence rate for 2002.[14]
- Mortality rates due to AIDS have been declining steadily since 1995. The estimated annual number of AIDS-related deaths in the United States fell approximately 70% from 1995 to 2001.[3] Data for 2002 show a 5.9% decline in AIDS deaths.

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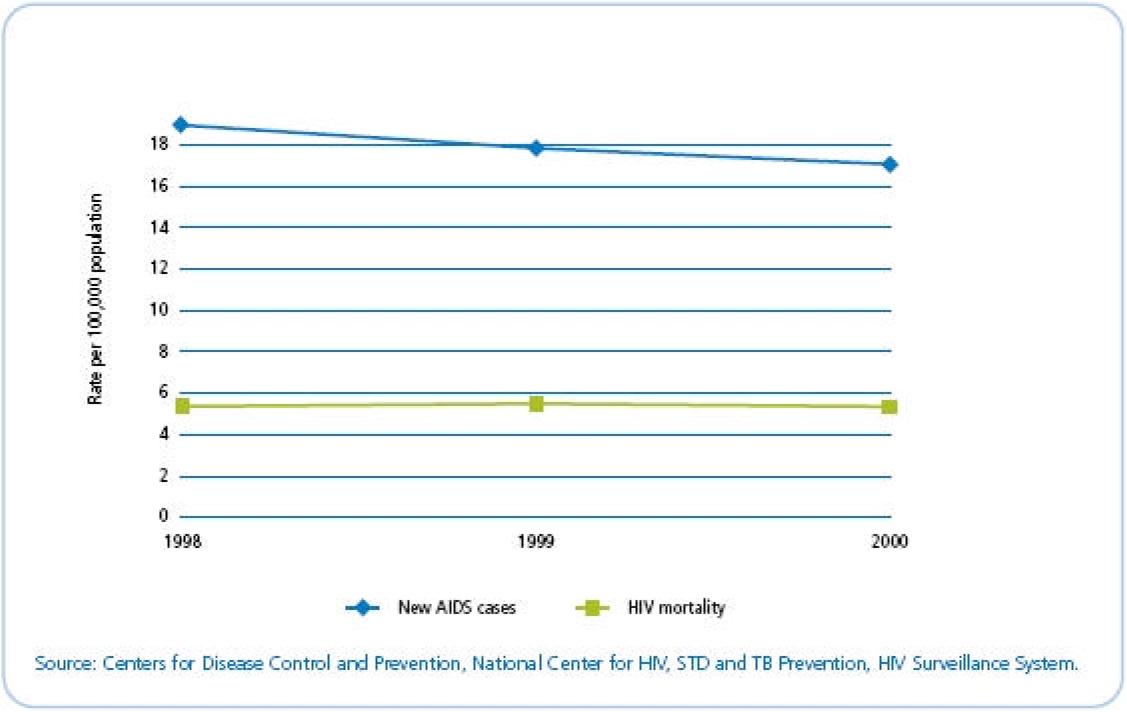
conditions are opportunistic infections that generally do not affect healthy people. In people with AIDS, these infections are often severe and sometimes fatal because the immune system is so ravaged by HIV that the body cannot fight off certain bacteria, viruses, fungi, parasites, and other microbes. See http://www.niaid.nih.gov/factsheets/hivinf.htm for more information.

[ii] Adjusting for known contributing factors, such as gender, age, and insurance status (multivariate analysis), would allow for more detailed exploration of the data, but this generally was not feasible for this report. Any adjustments that were done are noted in the detailed tables. The data presented in this report do not imply causation.

Figure 12 demonstrates that while there was a decline in the rate of new AIDS cases between 1998 and 2000, the rate of HIV mortality stayed virtually the same during that time.

Figure 12. New AIDS cases and HIV mortality



Source: Centers for Disease Control and Prevention, National Center for HIV, STD and TB Prevention, HIV Surveillance System.

New AIDS infection rates vary by age, with adults between 18 and 44 being infected at a rate that is 31% higher than the national average. Differences in AIDS infection rates are even more marked when broken down by ethnicity. Black, non-Hispanic adults contract AIDS at a rate that is 76% higher than the national average of 17.2 cases per 100,000.

What We Don't Know

Clinical care for HIV and AIDS is changing rapidly, making it difficult to evaluate national performance in quality of care and achieve consensus on national measures. Inclusion of quality measures in this report is limited by availability of national data.

Virtually all national data on HIV and AIDS are related to incidence and prevalence, not treatment. The Adult Spectrum of Disease and Pediatric Spectrum of Disease surveys run by the CDC are the start of a tracking system for HIV and AIDS. However, these surveys were not designed to provide national or subnational estimates for quality of care for people living with HIV and AIDS.

One area where the health care system may have an impact on the primary prevention of HIV infections is in preventing transmission of HIV from mothers to their infants. The CDC recently recommended routine HIV testing for all patients, especially pregnant women.[15]

Little has been done at the national level to develop and test potential measures for tracking the quality of care for the many opportunistic infections in HIV and AIDS patients. This may not involve the development of major new databases but, rather, using and enhancing existing national databases to examine care for the HIV and AIDS patient subpopulation.

Although protease inhibitors slow the progression of HIV, they also often result in significant side effects, including lipodystrophy, diabetes mellitus, hypercholesterolemia, etc. At present, there are no data that would allow us to track such side effects; yet these side effects are important in the lives of HIV-infected individuals.

Some interventions to address quality of life for people living with HIV and AIDS have been effective.[16,17] However, more information is needed on the types of behavioral and cognitive interventions that can be implemented and supported through the health system to improve quality of life.

What Can Be Done

Additional development of national quality measures for HIV and AIDS is needed. As described in the Executive Summary and Introduction to this report, the NHQR measure set is based on measures with regularly available national data sources.

Beyond currently available incidence and prevalence data, there is a need for improved information on quality and outcomes data for HIV and AIDS. There have been some efforts in this area, but they are based on single-point-in-time data collections. For example, the HIV Cost and Services Utilization Study (HCSUS) was a national study of HIV and AIDS care conducted between 1996 and 1998 that used a national probability sample of 4,042 people with HIV disease from 145 health care providers in 28 metropolitan areas and 51 providers in 25 rural areas. Some of the findings from HCSUS[iii] include:

- The researchers estimated total costs for treating all people with HIV during the first 6 months of 1996 at $6.7 billion and the average per person cost at $20,000.
- The researchers examined self-reported antiretroviral therapy (ART) use among 2,267 HCSUS participants in 1997. About 90% of participants reported use of any ART, and 61% reported use of the more advanced, currently recommended HAART (highly active ART: three or more drugs, including at least one protease inhibitor or nonnucleoside reverse transcriptase inhibitor).

[iii] For more information about HCSUS, see www.ahrq.gov/data/hcsus.htm.

- Only half of patients discussed some aspect of end-of-life care with their doctor, and 38% completed an advance directive. Patients were nearly six times more likely to complete an advance directive after a discussion with their provider.

List of Measures

HIV and AIDS

Measure Title	*National*	*State*
AIDS prevention:		
Outcome: New AIDS cases per 100,000 population (age 13 and over)	Table 1.46a (00) Table 1.46b (99) Table 1.46c (98)	N/A
Management of HIV and AIDS:		
Outcome: HIV-infection deaths per 100,000 population (00)	Table 1.47a (00) Table 1.47b (99)	Table 1.47c

Note: See Tables Appendix for tables listed above.

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Maternal and Child Health

Key Findings:

- More than 73% of children ages 19 to 35 months have all recommended vaccinations.
- Approximately 83% of women have prenatal care in their first trimester.
- The poorest children are less likely to be fully immunized and more likely to be hospitalized for pediatric gastroenteritis.
- Parents of children with disabilities and special health care needs are consistently less likely to report that their child’s doctor listens carefully, explains things clearly, and always shows respect for what the parent has to say.

Background and Impact

Measures of maternal, infant, and child mortality are widely tracked and are used in every major comprehensive national and international report as basic performance measures of health and health care delivery.[1,2,3,4,5] Despite this, quality measures and data sources for maternal and child health remain limited.

Key reasons for tracking the quality of maternal and child health include:

- Childbirth and reproductive health are the most common reasons for women of childbearing age to use health care. More than 11,000 babies are born each day, and childbirth is the most common reason for hospital admission in the United States. If complications occur, they have long-term implications for both the mother and newborn.
- Low vaccination rates raise the possibility of outbreaks of infections. An example is the measles outbreak in the United States in 1989 to 1991.[6]
- Children in poverty are generally in poorer health.[7]

In maternal and child health, minimal investments in preventive care can have a high impact. For example, benefits range from $2 to $24 for every dollar saved on vaccinations.[2] Prenatal care may help prevent neonatal deaths and avoid complications such as preterm births, premature rupture of membranes, placenta previa, fetal growth restriction, or post-term pregnancy.[8] Furthermore, there is some evidence that adequate prenatal care can result in health care savings in expenditures for newborn and postpartum care.[9,10]

How the NHQR Measures Maternal and Child Health Quality of Care

This section of the report addresses a subset of maternal and child health care indicators. These indicators are based on traditional definitions of maternal and child health care and include prenatal care, labor and delivery, basic child and adolescent health care, immunizations, and dental care. Good quality of care in maternal and child health[i] is measured by performance in these areas (see full list of measures at end of this section):

- Delivering basic childhood and adolescent preventive services (such as childhood and adolescent immunizations and preventive dental care for children).
- Preventing unnecessary hospitalizations for conditions such as pediatric gastroenteritis.
- Providing good quality maternity care.

Pediatric gastroenteritis accounts for nearly 10% of all hospital admissions of children under 5 years of age.[11] Moreover, proper outpatient treatment may reduce admissions for gastroenteritis; clear guidelines for such treatment have been established by the CDC and the American Academy of Pediatrics.[12,ii]

Information on children with special health care needs is offered in this section. Children with special health care needs (CSHCN) are defined as children with one or more limitations or needing or using more health care than is considered normal for the child's age. This definition and the CSHCN data screening tool were developed through a national collaborative process as part of the Child and Adolescent Health Measurement Initiative (CAHMI) coordinated by the Foundation for Accountability.[13]

The self-reported data on CSHCN in this report are from the Medical Expenditure Panel Survey. The CSHCN analysis uses a five-question screening tool and questions that focus on topics and services relevant for CSHCN.[iii]

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[i] The term "maternal and child health" is widely used by many national and international organizations for the set of services related to maternity care and basic childhood health care such as deliveries and immunizations. However, defined as such, this view of maternal and child health is more limited than what most experts would agree constitutes comprehensive health care for women and for children. Both Healthy People 2010, the guide for inclusion of priority conditions in the first NHQR, and the Institute of Medicine's report, Priority Areas for National Action: Transforming Health Care Quality, support the tracking of maternal and child health.

[ii] The tracking of measures of preventable hospitalizations is not meant to imply that every admission for a condition such as pediatric gastroenteritis is a mistake. These measures are meant to be tracked, as they are in this report, so that opportunities for improving the rate of preventable hospitalizations can be noted. For more information on measures such as this, readers are encouraged to examine information on the Quality Indicators at www.qualityindicators.ahrq.gov.

[iii] The CSHCN analysis uses the Maternal and Child Health Bureau's July 1998 definition as a starting point for identifying children for the measurement set: "Children with special health care needs are those who have...a chronic physical, developmental, behavioral, or emotional condition and who also require health and related services of a type or amount beyond that required by children generally." McPherson M, Arango P, Fox H, Lauver C, McManus M, Newacheck PW, et al. A new definition of children with special health care needs. Pediatrics 1998;102(1 Pt 1):137-40.

How the Nation Is Doing[iv]

National performance in maternal and child health is mixed. There are opportunities for improvement in both process and outcome measures of quality of care for women and children.

Delivering Basic Childhood and Adolescent Preventive Services

Early childhood immunization has been one of the success stories in the U.S. health care system, as States and national partners have worked together to ensure that children are protected against basic infectious diseases. Major efforts within HHS over the past 10 years have resulted in record numbers of children being immunized. Seventy-four percent of children ages 19 to 35 months in 2001 received all recommended vaccinations (NIS, 2001).[v]

However, there is some opportunity for improvement in the provision of dental services to children. Forty-seven percent of children between 2 and 17 visited a dentist in the past year; for children in fair or poor health, this percentage was 38%.[vi]

Preventing Hospitalization of Young Children for Gastroenteritis

Pediatric gastroenteritis leads to 320,000 hospitalizations (approximately 10% of all hospitalizations) and 3.7 million physician visits annually in children under age 5.[14] Although not all hospitalizations for pediatric gastroenteritis can be prevented, proper hydration and good quality care at home, at the primary care office, and in the emergency room may prevent hospitalization. The Nation's performance is improving, and hospital admissions significantly decreased between 1994 and 2000 (129.6 per 100,000 population versus 108.6 per 100,000). However, the poorest children are nearly twice as likely to be admitted to the hospital for gastroenteritis (HCUP, 2000).

Children With Special Health Care Needs

According to parents' reports, differences exist for children with special health care needs. Parents of CSHCN are consistently less likely than parents of children without such needs to report that their doctor always listens carefully (61% versus 67%), always explains things clearly (65% versus 70%), and always shows respect for what the parents have to say (63% versus 69%) (MEPS, 2000).

[iv] Adjusting for known contributing factors, such as gender, age, and insurance status (multivariate analysis), would allow for more detailed exploration of the data, but this generally was not feasible for this report. Any adjustments that were done are noted in the detailed tables. The data presented in this report do not imply causation.

[v] The data reported here are based on Healthy People 2010 goal 14-24a, that children aged 19 to 35 months receive the following vaccines: four doses of diphtheria, tetanus, pertussis (DPaT) vaccine; three doses of polio vaccine; one dose of measles, mumps, rubella (MMR) vaccine; three doses of Haemophilus influenzae type b (Hib) vaccine; and three doses of hepatitis B vaccine. This schedule does not protect children during the earliest period of life in which the vaccines are effective. The National Vaccine Advisory Committee, the American Academy of Family Physicians, and the American Academy of Pediatrics recommend that children receive the following vaccines within first 18 months of life, beginning shortly after birth: four doses of diphtheria, tetanus, pertussis vaccine; three doses of polio vaccine one dose of measles, mumps, rubella vaccine; four doses of H. influenzae type b vaccine; one dose of hepatitis B vaccine; and one dose of varicella vaccine. Under the CDCÅfs Advisory Committee on Immunization Practices (ACIP) schedule, additional doses, to complete series of certain vaccines, should be received before age 6.

[vi] See National Healthcare Quality Report, Tables Appendix, Table 1.63.

Prenatal Care

In general, there have been improvements over time in the delivery of prenatal care services and the outcomes of those services. In 2000, 7.6% of babies were born at 2,500 grams or less (low birthweight), and 1.4% of babies were born at 1,500 grams or less (very low birthweight). This number did not change between 1998 and 2000. Fewer infants died in 2000 versus 1998 (6.9 per 1,000 live births vs. 7.2 per 1,000 live births). Approximately 83% of women have prenatal care in the first trimester of their pregnancies (Vital Statistics, 2000).

What We Don't Know

It is difficult to draw broad conclusions about the performance of the Nation’s health care system in caring for mothers and children because of the gaps in our knowledge about quality of care for these populations. For example, while we have talked about performance in preventive care, which preventive services beyond immunization are most important for the long run? Although there may be consensus on what constitutes basic quality of care for adults with diabetes (see Diabetes section in this chapter), it is unclear whether these quality measures are appropriate for children.

Some measures of quality of care in maternal and child health are well documented at national and State levels, such as infant mortality and birthweight. Differences in these measures may be linked to variations in the quality of prenatal, labor, delivery, and early infant care. However, there are some areas about which we need to know more:

- The traditional measures of maternal and child health used in this report do not represent the full spectrum of health care for women and children. This spectrum includes the priority conditions highlighted in other sections of this report (e.g., diabetes and end stage renal disease). Although representative of inpatient care, development and refinement of existing measurement systems such as the AHRQ Quality Indicators— which currently include some measures of maternal health, such as mode of delivery and obstetric safety—could offer a more complete picture of how well the health care system serves mothers. Improved tracking in areas such as maternal mortality will greatly improve our understanding of maternal and child health.[15]

- National quality measurement for care of children poses challenges. First, children undergo tremendous physical, mental, and emotional change in a short time period, meaning that health care for children— and the assessment of that care—is more age-specific than for adult health care. A large part of national survey reporting is done for children as a block (i.e., ages 0 to 17), even though the processes of care for toddlers are very different from those for young children which are very different from those for adolescents. Assessing care nationally for children involves special sampling considerations versus tracking care for adults. Moreover, the tools of self-report used so often in national surveys for adults generally have not been used for children. “Proxy” reporting for children by parents through parent-administered questionnaires can be valid when properly designed,[16] but this proxy reporting creates challenges with many diseases.

- Innovative work is being done by organizations such as the Foundation for Accountability whose Child and Adolescent Health Measurement Initiative aims to develop and use quality measures for children in areas such as age appropriate medical guidance and parental education, family-centered care, and assessing care for children with special health care needs.[17]

What Can Be Done

This section has highlighted some areas where the Nation needs more information on care for children and areas for improving national performance in delivery of quality maternal and child health services. However, there are areas of promising research and demonstrated improvement that can also be highlighted.

Work by researchers from HHS/AHRQ and Harvard's School of Public Health highlighted the potential for improving quality of care measurement for children by adapting existing measures for adults. Generic measures based on events such as prolonged stays in the emergency department (ED) or monitoring of vital signs for trauma could be adapted by developing uniform definitions for pediatric-specific denominators and numerators. Other improvements in measurement include developing techniques that overcome the problem of small numbers for quality of care analyses. Such techniques would include aggregating cases across conditions to create generic measures such as followup of diagnostic tests performed in the ED. A second approach, which would have relevance in other areas of this report, is to create composites of quality of care, quality of life, and functional status across multiple chronic diseases.[18] Both these approaches have limitations.

Other organizations are moving from research into practice by attempting to make the business case for improving health care quality for children. AHRQ held an international expert meeting in early 2003 to explore improving children's health care quality. Participants were asked to focus on identifying how to enhance the level of public support for improvements in children's health care quality.

List of Measures

Maternal and Child Health

Measure Title	*National*	*State*
Maternity care:		
Process: % of pregnant women receiving prenatal care in first trimester	Table 1.48a (00) Table 1.48b (99) Table 1.48c (98)	Table 1.48d (00) Table 1.48e (99) Table 1.48f (98)
Outcome: % of liveborn infants with low and very low birthweight (less than 2,500 grams, less than 1,500 grams)	Table 1.49a (1500,00) Table 1.49b (1500,99) Table 1.49c (1500,98) Table 1.49d (2500,00) Table 1.49e (2500,99) Table 1.49f (2500,98)	Table 1.49g (1500,00) Table 1.49h (1500,99) Table 1.49i (1500,98) Table 1.49j (2500,00) Table 1.49k (2500,99) Table 1.49l (2500,98)
Outcome: Infant mortality per 1,000 live births	Table 1.50a (00) Table 1.50b (99) Table 1.50c (98)	Table 1.50d (99) Table 1.50e (98)
Outcome: Maternal deaths per 100,000 live births	Table 1.51a (00) Table 1.51b (99)	Table 1.51c (00) Table 1.51d (99)
[See Safety measures for complications of obstetric care]		
Immunization, childhood:		
Process: % of children 19-35 months who received all recommended vaccines	Table 1.52a (01) Table 1.52b (00) Table 1.52c (99) Table 1.52d (98)	Table 1.52e (01) Table 1.52f (00)
Process: % of children 19-35 months who received 4 doses of DPaT vaccine	Table 1.53a (01) Table 1.53b (00) Table 1.53c (99) Table 1.53d (98)	Table 1.53e (01) Table 1.53f (00)
Process: % of children 19-35 months who received 3 doses of polio vaccine	Table 1.54a (01) Table 1.54b (00) Table 1.54c (99) Table 1.54d (98)	Table 1.54e (01) Table 1.54f (00)
Process: % of children 19-35 months	Table 1.55a (01)	Table 1.55e (01)

who received 1 dose of MMR vaccine	Table 1.55b (00) Table 1.55c (99) Table 1.55d (98)	Table 1.55f (00)

Maternal and Child Health

Measure Title	*National*	*State*
Immunization, childhood (cont.)		
Process: % of children 19-35 months who received 3 doses of Hib vaccine	Table 1.56a (01) Table 1.56b (00) Table 1.56c (99) Table 1.56d (98)	Table 1.56e (01) Table 1.56f (00)
Process: % of children 19-35 months who received 3 doses of hepatitis B vaccine	Table 1.57a (01) Table 1.57b (00) Table 1.57c (99) Table 1.57d (98)	Table 1.57e (01) Table 1.57f (00)
Process: % of children 19-35 months who received 1 dose of varicella vaccine	Table 1.58a (01) Table 1.58b (00) Table 1.58c (99) Table 1.58d (98)	Table 1.58e (01) Table 1.58f (00)
Immunization, adolescent:		
Process: % of adolescents (age 13-15) reported to have received 3 or more doses of hepatitis B vaccine	Table 1.59 (00)	N/A
Process: % of adolescents (age 13-15) reported to have received 2 or more doses of MMR vaccine	Table 1.60 (00)	N/A
Process: % of adolescents (age 13-15) reported to have received 1 or more doses of tetanus-diphtheria booster	Table 1.61 (00)	N/A
Process: % of adolescents (age 13-15) reported to have received 1 or more doses of varicella vaccine	Table 1.62 (00)	N/A
Childhood dental care:		
Process: % of people over 2 years who report dental visit in last year	Table 1.63 (00)	N/A

Treatment of pediatric gastroenteritis:		
Outcome: Hospital admissions for pediatric gastroenteritis per 100,000 population less than 18 years of age	Table 1.64 (00)	N/A

Note: See Tables Appendix for tables listed above.

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Mental Health

Key Findings:

- Almost 80% of patients diagnosed with depression do not have optimal levels of contact with their health care provider.
- Only about 20% of patients prescribed a medication to treat diagnosed depression have at least 3 followup visits to monitor their medication within 12 weeks after diagnosis.
- Mortality due to suicide has been relatively stable over the years, averaging about 10 deaths per 100,000.

Background and Impact

Mental illness is a large burden on America's health, afflicting almost 20% of the population age 18 and over in a given year.[1,2] This section of the report addresses a particularly prevalent form of mental illness, depression.[i]

Depressive disorders are the second most prevalent form of all mental illness behind simple anxiety disorders.[3] Depressive disorders affect the ability of 19 million Americans to work, parent, learn, and fully participate in society.[2] Depression is the second leading cause of disability in the United States.[3]

The New Freedom Commission on Mental Health appointed by President Bush in 2002 attempts to address these longstanding problems.[4]

Costs of Depression

The personal and societal costs of depression are significant. They include:

- **Higher rates of death.** Studies show that depression is associated with higher mortality rates in all age groups.[5] Depression's impact is clear in the case of suicide. Suicide, a risk of untreated depression, is the 11th leading cause of death in this country, accounting for some 30,000 deaths each year.[6,7,8] Fifteen percent of depressed people take their own lives.[9] The suicide rate is six times higher among men age 85 and over than it is for the general population.[10,11,12]

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[i] Mental illness is a category of diseases and problems that includes major and minor depression, schizophrenia, substance abuse, bipolar disorder, Alzheimer's disease, and other disorders of the brain or mind. Limitations of national data sources resulted in a focus on depression in this report. It is envisioned that future reports will present a broader picture of mental health quality.

- **Serious complications for chronic disease patients.** People with heart disease, diabetes, cancer, stroke, Parkinson's disease, and HIV/AIDS are at much greater risk for depression than the overall population. Annual prevalence estimates of depression for these groups range from 10 to 65%.[7,8,13] Depression often negatively affects the course of these diseases. For example, depressed heart disease patients are much more likely to die after a heart attack than heart disease patients who are not depressed.[14] Depression can interfere with the ability of patients to follow medication and dietary regimens and has recently been linked to increased bone loss in women.[11,12,15,16,17]

- **Workplace costs of over $43 billion per year.[9,18]** People suffering from depression have high rates of absenteeism[9] (in some cases, three times more sick days than nondepressed workers)[19] and are less productive at work.[20]

- **Detrimental effects on all family members.** For example, children of mothers who suffer from chronic depression are more likely to have behavioral problems at school.[21]

- **Associated substance abuse problems.** Rates of undetected depression among drug and alcohol users are estimated to be as high as 30%. In 2001, the National Health Interview Survey reported that adults who used illicit drugs were twice as likely to report suffering from serious mental illness as adults who did not use drugs.[22]

Depressive disorders can affect anyone, including children as young as 10 years. Rates are higher among patients with chronic diseases, among women vs. men (12% vs. 7%), and among institutionalized elderly people (25%) and elderly people who live in the community (15%).[23,24,25,26,27,28,29]

Issues in Diagnosis and Treatment

Despite the seriousness of depression, it is not widely recognized, diagnosed, or treated.

- Only half of those who suffer from depression consider going to the doctor.[3]

- Depression and mental illness continue to carry a stigma.

- Half of those who seek care for depression approach their primary care provider first. However, primary care doctors sometimes miss a diagnosis of depression.[18,30] Data discussed in the following section highlight the increases in diagnosed cases of depression and prescriptions for depression.[31] However, primary care doctors correctly diagnose depression in only about one-third to one-half of their patients.[18,32] This is due to a number of factors which, taken together, make proper diagnosis very difficult. Depression's most common symptoms are the same as those for many physical ailments that doctors generally investigate.[33] In 2002, the U.S. Preventive Services Task Force formally recommended that doctors screen for depression.[18,30,34]

- Even when depression is diagnosed, it sometimes is not treated. There is evidence that doctors often do not treat depression after they diagnose it—even though there are effective treatments for more than 80% of depressive disorders.[7,30] Patients often reject a diagnosis of depression, further complicating treatment.[34]

How the NHQR Measures Mental Health Quality of Care

As in other areas of health care quality, there is not yet broad agreement within the mental health field on a core set of national quality of care performance measures for mental health in general, and for depression in particular. There is agreement about which antidepressant medications and psychological therapies are effective in treating depression and how medications should be prescribed and used for maximum benefit.

This report tracks three measures of medication treatment quality and one mortality measure. The medication measures come from the National Committee on Quality Assurance's HEDIS® (Health Employer Data and Information Set) measures for managed care plans. One of the primary reasons these measures were selected for the report was that regularly collected national data were available despite the fact that they were limited to managed care plans. These measures are:

- Percentage of adults diagnosed with a new episode of depression who had optimal practitioner contacts for medication management during the acute treatment phase. ("Optimal contact" is defined in HEDIS® as at least three followup office visits with a primary care or mental health provider in the 12-week acute treatment phase after a diagnosis of depression and prescription of antidepressant medication).[35]

- Percentage of adults diagnosed with a new episode of depression and started on an antidepressant drug who received a continuous trial of medication treatment during the acute treatment phase ("acute phase" is defined as treatment after a new episode of depression).[35]

- Percentage of adults diagnosed with a new episode of depression and started on an antidepressant drug who remained on an antidepressant medication through the continuation phase of treatment ("continuation phase" is defined as the percentage of patients who remained on antidepressant medication continuously in the 6 months after the initial diagnosis and treatment).[35]

As progress continues to be made in identifying appropriate measures for mental illnesses and as regularly collected national data become available, examination of quality of care in mental illness can be expanded beyond the managed care setting.

The outcome measure for this section of the report focuses on mortality due to suicide and comes from the CDC/NCHS National Vital Statistics System:

- Deaths due to suicide per 100,000 population.

How the Nation Is Doing[ii]

Quality of Medication Treatment

Limited progress is being made in quality of medication treatment. Almost 80% of patients diagnosed with depression do not have optimal levels of contact with their health care provider. About 60% of depressed patients do not receive the acute phase treatment they need, and about 40% do not receive the continuous phase treatment they should have. Moreover, these rates have not improved over the 3-year period for which these measures were tracked (1998, 1999, and 2001; data were not available in 2000).

In 1999, almost 59% of adults diagnosed with a new episode of depression received a continuous trial of antidepressants through the acute phase of treatment, but in 2001, that dipped to less than 57%. Finally, in 2001 there was a decrease of 2 points to 40% from 42% in 1999 for adults who remained on antidepressants through the continuation phase of treatment.

Research shows that half of the outpatients being treated for depression in primary care settings stop using their medicines within the first month.[36] Sometimes side effects discourage patients from sticking with their treatment course.[37] Other times, the drugs work so well that the patients mistakenly believe they have been cured and discontinue the medication. Thus, they do not remain on drugs long enough to reap the full benefits of the drugs. For most patients, there is a range of treatments, and pharmacotherapy may be one of a set of treatment options.[3] That said, research on therapeutic trends in mental health have pointed to the greater use of psychotropic medications and less use of psy-chotherapy.[38]

Suicide

The suicide rate for adults has been relatively stable over the years, averaging just over 10 deaths per 100,000 in the adult population. For young adults, the rate has leveled off for the age group 5 to 14 years and even declined between 1991 and 2000 for the age group 15 to 24 years.[39] However, men are four times more likely to commit suicide than women, and elderly men have the highest suicide rate of all groups.[5]

What We Don't Know

National data on core quality measures for mental health are needed. Mental health is recognized as an important national priority.[40] The Substance Abuse and Mental Health Services Administration and the American Medical Association's Physician Consortium for Performance

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[ii] Adjusting for known contributing factors, such as gender, age, and insurance status (multivariate analysis), would allow for more detailed exploration of the data, but this generally was not feasible for this report. Any adjustments that were done are noted in the detailed tables. The data presented in this report do not imply causation.

Improvement are addressing the need for core measures through scientific review and consensus development of potential mental health quality measures. Because national data on a core set of measures are not available, we have only limited information on who is treated for mental illness and how often and effectively these treatments are administered.[41]

The limited national level information on mental illness that is available concentrates on depression, not other important mental health disorders, such as schizo-phrenia,[42] bipolar disorder, posttraumatic stress, generalized anxiety, Alzheimer's disease, and others. Because successful treatments have been developed for some of these diseases and knowledge about them continues to grow, they may be good candidates for tracking quality of care and improvement.

Measures in two areas are particularly needed: mental disorders other than depression and for vulnerable population subgroups. Data are insufficient to track the quality of mental health treatment provided to young adults or the elderly, both of whom have high rates of suicide closely related to depression.

What Can Be Done

Progress is being made in a number of areas related to the treatment of mental illness. One potentially important new initiative involves creating a searchable database of quality measures for mental health. Developed by the Center for Quality Assessment and Improvement in Mental Health (CQAIMH), with funding from AHRQ, the National Institute of Mental Health, and SAMHSA, this database includes more than 300 process measures in 7 domains of quality, including access, assessment, treatment, continuity, coordination, patient safety, and prevention.[43] The measures were developed by government agencies, researchers, professional organizations, consumer coalitions, commercial organizations, and others. The database provides the clinical context for the measure, a summary and rating of supporting research evidence, measure specifications, data requirements, domain of quality, treatment modality, population, and developer information. In the future, the CQAIMH intends to expand its Web site to include a toolkit of quality management tools and a consumer's guide to quality in mental health care. This is an important start in terms of identifying possible measures. Efforts currently being carried out by SAMHSA and others will help focus quality measurement on a limited set of valid key measures of quality for mental health care.

List of Measures

Mental Health

Measure Title	*National*	*State*
Treatment of depression:		
Process: % of adults diagnosed with a new episode of depression who had optimal practitioner contacts for medication management during the acute treatment phase	Table 1.65	N/A
Process: % of adults diagnosed with a new episode of depression and initiated on an antidepressant drug who received a continuous trial of medication treatment during the acute treatment phase	Table 1.66	N/A
Process: % of adults diagnosed with a new episode of depression and initiated on an antidepressant drug who remained on an antidepressant medication through the continuation phase of treatment	Table 1.67	N/A
Outcome: Deaths due to suicide per 100,000 population	Table 1.68a (00) Table 1.68b (99)	Table 1.68c (00)

Note: See Tables Appendix for tables listed above.

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Respiratory Diseases

Key Findings:

- The percentages of "high risk" individuals who reported having had influenza and pneumonia vaccinations are 20.8% and 15.4%, respectively. Rates are higher for elderly individuals on these same measures (65% and 54%, respectively).
- More than 80% of Medicare enrollees hospitalized with pneumonia have blood cultures taken before antibiotic administration, have their initial antibiotic within 8 hours of hospital arrival, and have antibiotics consistent with current clinical guidelines.
- Nearly one-third of children and adults are not prescribed primary therapy medications to control their asthma.
- Rates of child admissions for asthma are 29.5 per 10,000, more than twice that of adults (12.5 per 10,000).

Background and Impact

Respiratory disease encompasses a broad array of illnesses that affect an increasing number of Americans. As recently as 1980, chronic lower respiratory diseases and influenza and pneumonia did not even appear in the top 10 causes of death in the United States. In 1999, they were the fourth and seventh leading causes of death, respectively.[1] Respiratory diseases are also among the leading causes for hospital admissions nationally, and pneumonia treatment costs in the United States top $9.7 billion.[2] For children, pneumonia is one of the leading causes of hospital admission; and among the elderly, pneumonia admissions have increased 18% since 1988.[3]

Asthma is another important disease. More than 25 million Americans have been told by a provider that they have asthma.[4] Recent data show continuing increases in asthma-related hospitalizations, emergency department visits, and deaths, especially among minority populations.[5]

Tuberculosis (TB) continues to be a national priority condition. After several years of TB resurgence, the number of cases is at an all-time low.[6] In fact, TB has declined tenfold since 1953 when CDC began tracking incidence of the disease.

One of the key reasons respiratory diseases are important for national quality measurement is because they can be treated and managed effectively. The conditions presented in this report are either infectious diseases that may be controlled through immunization or drug therapies, or they are chronic diseases that may be managed with proper primary care and medication.

How the NHQR Measures Respiratory Diseases Quality of Care

Measures of quality of care for respiratory illnesses presented in this report fall into the following categories (see full list of measures at end of section):

- Preventing influenza through targeted immunization.
- Preventing and treating pneumonia.
- Managing asthma.
- Reducing overprescription of antibiotics for the common cold.[i]
- Treating TB.

All of the aspects of care discussed in this section have been identified as HHS priorities for quality improvement.[7]

One measurement area discussed here is inappropriate care. Articles in both the popular and professional press have focused on rising rates of antibiotic ineffectiveness and drug-resistant infections.[8,9,10,11] Reducing antibiotic overuse is a national priority through CDC's National Campaign for Appropriate Antibiotic Use.[12]

How the Nation Is Doing[ii]

Drug resistance and the emergence of new strains of certain infectious respiratory diseases, as well as increases in the prevalence of certain chronic lung illnesses, continue to be of concern. Improvement in the delivery of care is possible.

Managing Asthma

The number of people with asthma has more than doubled in the past 15 years; and even if rates were to stabilize at their current numbers, asthma would remain a serious public health issue.[13] Direct health care costs for asthma in the United States total more than $8.1 billion annually, and indirect costs associated with lost productivity add another $4.6 billion. Moreover, inpatient hospital services for asthma represent a major medical expenditure nationally at more than $3.5 billion annually.[14] Although death from asthma is almost always preventable if care is sought in

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[i] Antibiotics are bacterial or fungal metabolites that inhibit the growth of other bacteria or fungi. Some are used clinically against infections, but others are anticancer or immunosuppressive drugs. The measure in this report looked at the use of antibiotics for nasal pharyngeal infections, acute upper respiratory infection, and chronic rhinitis.

[ii] Adjusting for known contributing factors, such as gender, age, and insurance status (multivariate analysis) would allow for more detailed exploration of the data, but this generally was not feasible for this report. Any adjustments that were done are noted in the detailed tables. The data presented in this report do not imply causation.

a timely fashion, more than 4,600 people died of the condition nationwide in 1999.[15] In addition, data[iii] show that:

- Children age 17 and under are much more likely to be admitted to a hospital for asthma than are adults (29.5 per 10,000 versus 12.3 per 10,000).

- Black children in America are nearly twice as likely to be admitted to a hospital for asthma as white children.

- According to national estimates from NCQA's HEDIS® data, nearly a third of children and adults are not receiving primary therapy medications[iv] to control their asthma.

The increase in asthma prevalence and its costs to the American health care system have caused concern among health care policymakers and providers. In recent years, there has been considerable attention paid to effective medical management and patient education programs based on clinical guidelines. Research has shown that these programs reduce the use of emergency services and improve quality of life for people with asthma.[16,17,18,19]

Despite the increase in asthma prevalence, there are gains in effective management of asthma. Although even the best primary care may not necessarily avoid hospitalizations, hospital admissions for asthma can be used as one measure of timely and effective primary care. Data from both the National Hospital Discharge Survey (NHDS) and the Healthcare Cost and Utilization Project show improvements in the rate of admissions for asthma. Between 1994 and 2000, these admissions have decreased between 10% and 20% for adults according to NHDS and HCUP figures.

Reducing Overprescription of Antibiotics for the Common Cold

In 1996, the National Center for Health Statistics estimated that viral respiratory tract infections accounted for more than 20 million lost workdays for adults and 21 million lost school days for children annually.[20] Too often, these viral infections are being inappropriately treated with antibiotics, a practice that has contributed to the development of drug-resistant strains of bacteria. As a result, a nationwide campaign to reduce antimicrobial resistance has been launched,[21] and the Food and Drug Administration has promulgated new rules on labeling of antibiotics.[22] Addressing the problem of overprescription of antibiotics is difficult, as patient preferences for these prescriptions exist.[23] Some research has suggested that levels of antibiotic prescriptions are underreported.[11] In addition to the problem of drug-resistance, the inappropriate use of antibiotics has implications for private and public health care spending in physician offices, outpatient clinics, and emergency departments.[24] Despite the attention paid to overprescription of antibiotics, data indicate that there is still room for improvement in this area.

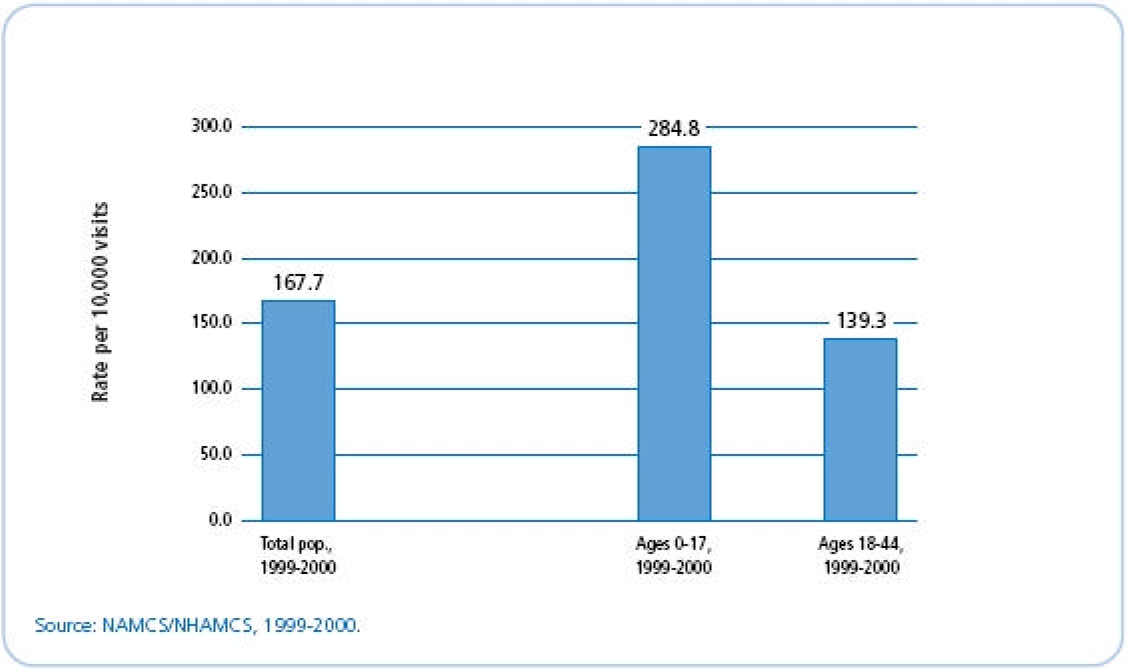
[iii] Data on hospitalizations for asthma in the NHQR come from the National Hospital Discharge Survey, 2000 (available at: http://www.cdc.gov/nchs/products/pubs/pubd/ad/321-330/ad329.htm). Additional data analysis carried out for the report from the HCUP also highlights that the poorest as well as the youngest children are most at risk for being hospitalized for asthma.

[iv] Primary therapy medications are defined by the NCQA as inhaled corticosteroids.

- There has not been any recent statistically significant improvement in the rate of inappropriate antibiotic prescriptions for the common cold (1997 to 1998 vs. 1999 to 2000).[v]

- Visits by children under age 17 are twice as likely to result in inappropriate antibiotic prescriptions as visits by adults (see Figure 13).

Figure 13. Antibiotic prescribing for common cold



Source: NAMCS/NHAMCS, 1999-2000.

Preventing Influenza and Preventing and Treating Pneumonia

State and/or regional data are not available for all respiratory disease measures tracked in this report. However, for a number of respiratory illness measures, such as immunizations for influenza, there are data on national performance across the regions of the country. Twenty States had scores of 90% or better for immunizing seniors against the flu, according to 2001 data from the Behavioral Risk Factor Surveillance System.[25,vi]

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[v] However, there have been declines in such prescriptions by office-based physicians. See Linder JA, Stafford RS. Antibiotic treatment of adults with sore throat by community primary care physicians: a national survey, 1989-1999. JAMA 2001;286(10):1181-6, and McCaig LF, Besser RE, Hughes JM. Trends in antimicrobial prescribing rates for children and adolescents. JAMA 2002;287(23):3096-102.

[vi] Note that because the Behavioral Risk Factor Surveillance System is a household survey, estimates for the elderly exclude immunization of those in nursing homes.

The HHS/CMS Quality Improvement Organization program for Medicare enrollees has defined basic quality for the treatment of pneumonia at the hospital level. National performance is excellent on measures such as the percentage of patients who have their blood cultures taken prior to the administration of antibiotics, receive the initial dose of antibiotics within 8 hours of hospital arrival, and receive the correct antibiotics, according to current standard of practice, for their condition. For each of these measures, national performance is greater than 80%. However, performance on the percentage of patients with pneumonia who receive a flu or pneumonia screening[vii] or immunization prior to hospital discharge is still below 30% for both measures.

What We Don't Know

Respiratory disease is one of the areas within the NHQR framework in which there is consensus on what constitutes good quality of care. We know that immunization reduces the rate of influenza infection and pneumonia. We know how to properly treat patients with pneumonia. We know what medications currently work best for managing asthma, and we know how to control the spread of TB.[26,27,28]

There are gaps in our ability and knowledge on how best to diagnose and treat respiratory diseases. For example, management of multi-drug resistant TB is a growing challenge in this country. A significant push will be needed to realize the potential for quality improvement in prevention and treatment of all respiratory diseases. Nationally, more information is needed on:

- Efforts toward quality improvement— whether locally by individual hospitals, or nationally through programs such as the Medicare QIO program— have shown results.[29,30] Ways to expand these gains to other populations and settings need to be explored.

- Without systematic and consistent use of evidence-based guidelines in practice, performance will continue to lag behind knowledge in managing asthma, upper respiratory infection, and in some areas, pneumonia.

- Short-term research that emphasizes drug efficacy trials predominates the literature on asthma. More information is needed that can support clinical decisionmaking on the intensity of treatment, optimization of medication regimens, and utility of disease management interventions for various asthma populations.[28]

What Can Be Done

Improving quality of care for patients with respiratory disease should be the goal of any quality measurement effort such as this report. We need to understand where we are doing well and where we are doing poorly; for instance, examining existing data to better understand why some

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[vii] More information on this screening measure is available in the Measure Specifications Appendix as well as from the Centers for Medicare & Medicaid Services.

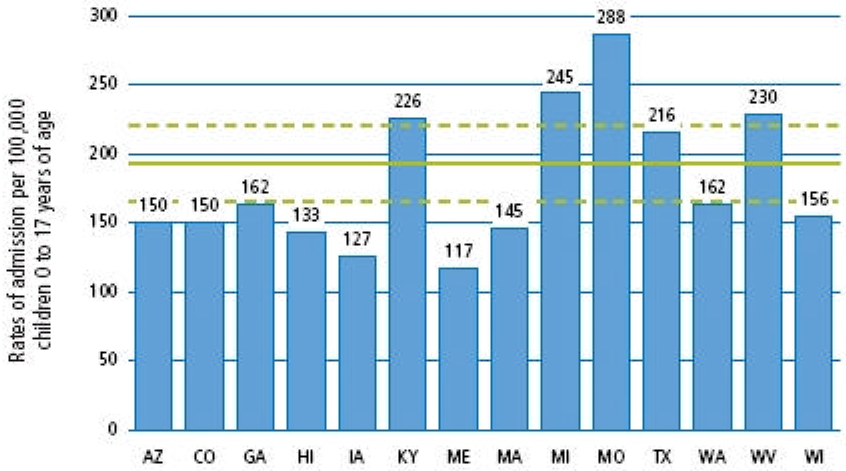
areas of the country do better than others at delivering respiratory disease care. HCUP, which tracks national and State data for a variety of quality measures, is one such source of State data. A first look at some State analyses for asthma quality of care is presented in Figure 14.

State Variation in Admission Rates for Childhood Asthma

Admissions for childhood asthma vary widely across the Nation. Several State data sources shared with AHRQ their rates of admission for pediatric asthma—potentially preventable hospitalizations. While this is not a complete or random sample of States, the rates differ by almost two-and-a-half times from the lowest to the highest among these States. The States shown here (see Note) are part of AHRQ's Federal-State-Industry partnership, known as the Healthcare Cost and Utilization Project , which combines States' hospital discharge records into a uniform database to make such insights possible. The U.S. rate is based on the Nationwide Inpatient Sample, a sample of hospitals from 28 HCUP States weighted to a national estimate.

What causes the differences in these preventable hospitalizations? Undoubtedly many factors, including prevalence of the disease; severity of the condition when presented to the doctor; different approaches by physicians to treating asthma in community settings and judgments about when to hospitalize; differential access to hospital beds, emergency rooms, and health care professionals; income levels; availability of insurance and effective disease management programs; environmental risk and behavioral factors (such as second-hand smoke levels) among populations; and education about the warning signs of disease, prevention, and when to consult a doctor. Also, HCUP relies on State-specific data collection methods, which may contribute to the differences. These potential factors need further study.

Figure 14. Childhood asthma admission rates by State, 2000



Source: Selected HCUP Partner States.

Note: HCUP Partners providing their data for this example are: Arizona Department of Health Services, Colorado Health & Hospital Association, Georgia Hospital Association, Hawaii Health Information Corporation, Iowa Hospital Association, Kentucky Department for Public Health, Maine Health Data Organization, Massachusetts Division of Health Care Finance and Policy, Michigan Health and Hospital Association, Missouri Hospital Association, Texas Health Care Information Council, Wisconsin Department of Health and Family Services, Washington State Department of Health, West Virginia Health Care Authority.

Better use of data to understand variation and causes behind unfavorable respiratory illness outcomes is one component of efforts to improve quality of care for these illnesses. Another component is the dissemination of best practices in respiratory illness. In addressing TB, screening and treatment for latent TB infection (LTBI) have been key components of the national strategy for TB elimination in the United States for more than 35 years. Updated guidelines, issued in 2000, urge public health programs to direct TB screening activities toward populations most at risk for LTBI and TB.

The Virginia Department of Health has advocated screening and treatment of LTBI as a TB control strategy for many years. In 1998, approximately 90,000 people were screened for TB infection by local health departments in Virginia; only an estimated 40% belonged to high-risk groups. The remaining low-risk individuals were screened primarily due to requirements established by State or local regulation or private employers. From 1999 to 2002, the Virginia Division of TB Control led a successful, statewide initiative to establish risk-based, targeted tuberculin testing as the official TB screening policy for all State agencies throughout the Commonwealth of Virginia. As a result of these efforts, testing of individuals at low risk for TB infection or disease was dramatically reduced, as evidenced by the results below:

- Between FY 2000 and FY 2002, there was a 39.8% (69,569 versus 41,913 tests) decrease in the number of tuberculin skin tests administered statewide. Thirty of the 35 local districts reported decreases in the number of tests administered.

- As a consequence of this policy change, use of State-funded chest radiography services declined by 88%, resulting in an annual cost savings of nearly $175,000 compared with FY 1998.

- Over this same time period, the percentage of positive results among those tested increased from 3.4% to 6.1%, suggesting that the targeted testing policy has improved the efficiency of screening.[31]

List of Measures

Respiratory Diseases

Measure Title	*National*	*State*
Immunization, influenza:		
Process: % of high risk individuals (e.g., COPD) age 18-64 who received an influenza vaccination in the past 12 months	Table 1.69a (00)	Table 1.69b (01)
Process: % of individuals age 65 and over who received an influenza vaccination in the past 12 months	Table 1.70a (00)	Table 1.70b (01)
Process: % of institutionalized adults (people in long-term care or nursing homes) who received an influenza vaccination in past 12 months	Table 1.71a (99) Table 1.71b (97)	N/A
Outcome: Hospital admissions for immunization-preventable influenza per 100,000 population	Table 1.72 (00)	N/A
Immunization, pneumonia:		
Process: % of high risk individuals (e.g., COPD) age 18-64 who ever received a pneumococcal vaccination	Table 1.73a (00)	Table 1.73b (01)
Process: % of individuals age 65 and over who ever received a pneumococcal vaccination	Table 1.74a (00)	Table 1.74b (01)
Process: % of institutionalized adults (people in long-term care or nursing homes) who ever received a pneumococcal vaccination	Table 1.75a (99) Table 1.75b (97)	N/A
Treatment of pneumonia:		
Process: % of patients with pneumonia who have blood cultures collected before antibiotics are administered	Table 1.76a	Table 1.76b

Process: % of patients with pneumonia who receive the initial antibiotic dose within 8 hours of hospital arrival	Table 1.77a	Table 1.77b

Respiratory Diseases

Measure Title	*National*	*State*
Treatment of pneumonia (cont.)		
Process: % of patients with pneumonia who receive the initial antibiotic consistent with current recommendations	Table 1.78a	Table 1.78b
Process: % of patients with pneumonia who receive influenza screening or vaccination	Table 1.79a	Table 1.79b
Process: % of patients with pneumonia who receive pneumococcal screening or vaccination	Table 1.80a	Table 1.80b
Treatment of URI:		
Process: % of visits where an antibiotic is prescribed for the diagnosis of a common cold, children and adults	Table 1.81a (9900) Table 1.81b (9899) Table 1.81c (9798)	N/A
Management of asthma:		
Process: % of people with persistent asthma who are prescribed medications acceptable as primary therapy for long-term control of asthma (inhaled corticosteroids)	Table 1.82 (00)	N/A
Outcome: Hospital admissions for pediatric asthma per 10,000 population under age 18[viii]	Table 1.83a (nhds00) Table 1.83b (nhds99) Table 1.83c (nhds 98)	N/A

[viii] This measure is one for which two comparable national data sources exist—the National Hospital Discharge Survey and the Healthcare Cost and Utilization Project. Both data sources present information on potentially preventable hospital admissions with some slight variation in the measure specifications for individual measures. This report relied on Healthy People 2010 measure specifications to determine which data source should be used in the report for individual measures. More information is available in the Measure Specifications Appendix. More information on the NHDS is available at http://www.cdc.gov/nchs/about/major/hdasd/nhds.htm. More information on HCUP and the AHRQ Quality Indicators is available at www.ahrq.gov/data/hcup and www.qualityindicators.ahrq.gov, respectively.

Outcome: Hospital admissions for asthma per 10,000 population age 18-64[viii]	Table 1.84a (nhds00) Table 1.84b (nhds99) Table 1.84c (nhds 98)	N/A
Outcome: Hospital admissions for asthma per 100,000 population age 65+	Table 1.85 (00)	N/A

Respiratory Diseases

Measure Title	*National*	*State*
Treatment of TB:		
Process: % of TB patients that complete a curative course of TB treatment within 12 months of initiation of treatment	Table 1.86a (99) Table 1.86b (98)	N/A

Note: See Tables Appendix for tables listed above.

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Nursing Home and Home Health Care

Key Findings:

- The measures used in this report reveal variation across both States and measures, thereby highlighting the opportunity to improve quality of nursing home and home health care.
- Progress has been made in reducing use of physical restraints in nursing homes. Nationally, fewer than 10% of chronic care nursing home residents are in physical restraints, although this ranged from 2.7% to 22.4 % among States.
- Although not all patients can be expected to improve, 57% of home health patients who needed assistance with bathing improved.
- Although not all patients can be expected to improve, 35% of home health patients who needed assistance with managing oral medications improved.

Background and Impact

Nursing home and home health services are an important component of the U.S. health care system, accounting for at least $132 billion[i] or 9% of national health expenditures in 2001.[1] According to the latest available national data, there were 1.6 million current nursing home residents and 2.5 million discharges from nursing homes during 1999, and approximately 1.4 million patients were served by home health agencies in 2000.[2,3] Nearly all (98%) of the Nation's 18,000 nursing homes and 90% of home health agencies are certified by either the Medicare or Medicaid programs.

Nursing home and home health are part of the spectrum of services addressing a person's needs for long-term care, post-acute care, and rehabilitative, chronic, and palliative care. Care in this spectrum consists of a broad range of health and social services delivered in a variety of settings (institutions, outpatient and community settings, and the home) by many different providers. This section of the report focuses on the quality of services provided by a subset of all these providers—nursing homes, the major institutional provider of long-term care services, and home health agencies— because national data are currently available on these providers. Table 1 illustrates the different types of patient needs and the types of providers offering care for these needs. These categories are not mutually exclusive, since people often have multiple needs (e.g., a frail elder with several chronic conditions recently discharged from the hospital), and providers may serve many types of patients (e.g., nursing homes providing care, long-stay residents with dementia or physical disabilities, and short-stay residents who have post-acute care needs, such as hip fractures, or who are terminally ill).

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[i] This amount does not include expenditures for hospital-based nursing homes or home health agencies.

Table 1. Spectrum of patient needs and providers

Distinctions	***Post-acute health care***	***Long-term care***	***Palliative care***	***Chronic health care***
Types of needs	People who need treatment after or instead of hospitalization for an acute illness, injury, or exacerbation of a disease process	People who need assistance with activities of daily living (ADLs) and instrumental activities of daily living (IADLs)	People who need care for minimizing effects of terminal illnesses, including supportive care services providing physical, psychosocial, and spiritual care for themselves and their families	People who need on-going management or treatment of a health condition, such as diabetes, arthritis, hypertension, or heart disease
Types of providers	***Skilled nursing facilities (SNF)***[ii] ***Home health agencies*** Specialty hospitals-rehabilitation and long-term care hospitals Outpatient/ independent therapy services Informal care (family and friends)	***Nursing facilities (NF)***[ii] Community based residential care (assisted living facilities, life care communities, board and care, adult foster care) ***Home health agencies*** Home and community-based service provider (e.g., adult day care, In-home, personal care, homemaker service agencies) Consumer-directed care Informal care (family and friends)	Hospice care agencies ***Home health agencies*** Nursing homes Informal care (family and friends)	Outpatient and physician offices ***Home health agencies*** ***Nursing homes*** Informal care (family and friends)

Note: Measures examined in this report appear in bold and italics.
Source: Adapted from Scanlon, Understanding Post-Acute, Chronic, and Long-Term Care.[4]

[ii] Skilled nursing facility and nursing facility are terms used by Medicare and Medicaid. In this report, the term "nursing home" is used for both.

Services within this spectrum often are not disease- or condition-specific; rather, they focus on ADL and IADL needs, minimizing the effects of disability, maintaining function, and slowing deterioration. At the palliative care end of the spectrum, there is hospice care for terminally ill people and their families.[5]

Quality of care in nursing homes has been an ongoing concern for years.6,7 This concern was addressed in the Omnibus Budget Reconciliation Act of 1987 (OBRA-87, or Public Law 100-203), which established goals for quality care and patient quality of life in nursing homes. OBRA-87 also mandated monitoring of the quality of home health care.

How the NHQR Measures Nursing Home and Home Health Quality of Care

Nursing Home Care

OBRA-87 and subsequent Federal regulations added new requirements for quality of care, resident assessment, and care planning and provided a range of new enforcement remedies.[8] The regulations required that all Medicaid and Medicare certified nursing homes use a standardized comprehensive functional assessment tool to assess all residents and assist in developing individualized care plans. The Minimum Data Set (MDS) is used as the core functional assessment instrument of the Resident Assessment Instrument (RAI) and covers a number of domains, including ADLs, continence, cognitive patterns and delirium symptoms, mood and behavior patterns, skin condition, nutritional status and weight loss, disease and health conditions (including pain), and special treatments and procedures.[iii] Since OBRA-87 was enacted, the following improvements have been reported:

- Improved processes of nursing home care, such as increased comprehensiveness of care plans and decreased use of restraints.[8]
- Improved outcomes of selected health conditions (dehydration, malnutrition, pressure sores).[9]
- Slowed deterioration in seven of nine outcomes of nursing home residents.[10]
- Declines in the rates of antipsychotic drug use.[11]

Using measures derived from MDS data for 2002, this report presents information on quality by facility performance for both long- and short-stay residents.[iv]

[iii] See Measure Specifications Appendix and www.cms.hhs.gov/medicaid/mds20/man-form.asp for more information on the MDS.

[iv] This report uses the CMS definition of chronic care and post-acute care. Chronic care refers to patients who typically enter a nursing facility because they are no longer able to care for themselves at home. These patients (or residents) tend to remain in the nursing facility from several months to several years. The chronic quality measures (QMs) are calculated on any residents with a full or quarterly MDS in the target quarter.

The development of these measures and their selection are described elsewhere.[12,13] All of these nursing home measures are used by CMS for their Nursing Home Quality Initiative, for which national public reporting started in November 2002.

More detail on all these measures, including risk adjustment, is available in the Measure Specifications Appendix.

Home Health Care

OBRA-87 also affected home health services by mandating that Medicare monitor the quality of home health care and services with a "standardized reproducible assessment instrument...the extent to which the quality and scope of items and services furnished by the agency attained and maintained the highest practicable functional capacity of each individual as reflected in such individual's plan of care...and clinical records..."[14] Starting in 1999, uniform assessment data are collected for all adult, nonmaternity Medicaid and Medicare patients in home health agencies, using the Outcome and Assessment Information Set. The OASIS data do not constitute a comprehensive assessment, but agencies are required to integrate the OASIS items into their own assessment instruments. Agencies are required to submit their OASIS data for only a subset of their patients (Medicare and Medicaid patients receiving skilled services). The data are then sent to CMS, and a variety of outcome reports are derived for quality assurance and improvement.

The Home Health Outcome-Based Quality Improvement (OBQI) System is a voluntary framework for quality improvement based on OASIS data.[15,16] This OBQI system includes a total of 41 outcome measures.

Quality of care in the area of home health is summarized by performance in 12 of these outcome measures in the following categories:

- Meeting the patient's basic daily needs (four measures).
- Improvement in getting around (four measures).
- Improvement in physical health (two measures) and mental health status (one measure).
- Percentage of patients admitted to acute-care hospitals (one measure).

These quality measures are based on OASIS assessment data from January 1, 2002 to December 31, 2002 for approximately 7,000 home health agencies (HHAs), predominantly for Medicare patients (about 92%). Most of these home health measures are also being used by CMS for the Home Health Quality Initiative. The AHRQ Technical Expert Panel on Home Health Quality Measures provided input for both the CMS public reporting initiative and this report. The TEP

Post-acute care refers to patients who are admitted to a facility and stay less than 30 days. These admissions typically follow an acute-care hospitalization and involve high-intensity rehabilitation or clinically complex care. The post-acute QMs, are calculated on any patients with a 14-day MDS assessment (required under the Prospective Payment System [PPS]) in the last 6 months. See CMS Web site for exact specification: www.cms.hhs.gov/quality/nhqi/Nat1UserMan_v1_1.pdf.

noted that some measures were better than others for national, as compared with agency-level, reporting and also better for different audiences, e.g., consumers versus policymakers.[17]

More detail on all of these measures, including risk adjustment, is available in the Measure Specifications Appendix.

How the Nation Is Doing[v]

Assessing how the Nation is doing requires a comparison of State rates with national averages, since there are no data or only limited trend data on the home health and nursing home measures included in this report. Some measures show a large variation in State performance on both nursing home and home health quality. This variation highlights the opportunities for improvement in both nursing home and home health quality of care.

Providing Quality Services to Chronic Care Nursing Home Residents[vi]

Restraints

OBRA-87 states that, “residents have the right to be free from any physical or chemical restraint imposed for purposes of discipline or convenience and not required to treat the resident’s medical symptoms.”[18] Restraints should be imposed only to ensure the physical safety of the resident or that of other residents and only on the written order of a physician, “with a time limit and circumstances of use noted.” CMS encourages gradual restraint reduction because of the many negative outcomes associated with restraint use.

The baseline data in this report indicate a national average (see the Measure Specifications Appendix for calculation) of less than 10% of residents in physical restraints, ranging from 2.7% to 22.4 % among the States. Twenty-eight States had significantly fewer residents in restraints than the national average and 12 States had significantly more residents in restraints (see Figure 15A).

State survey data over a number of years indicate that use of restraints has declined dramatically, from 44% in 1989 to 21% in 1992, and approximately 13% in 2002.[19] These data also show that the percentage of nursing facilities that are restraint-free has risen from 1% to 11% during this time.

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[v] Adjusting for known contributing factors, such as gender, age, and insurance status (multivariate analysis) would allow for more detailed exploration of the data, but this generally was not feasible for this report. Any adjustments that were done are noted in the detailed tables. The data presented in this report do not imply causation.

[vi] Nursing home data are from MDS, downloaded from the CMS Nursing Home Compare Web site, November 2002, www.medicare.gov/nhcompare/home.asp.

Pain

Although untreated pain reduces quality of life, it is a common problem in nursing homes.[20] Pain control is important for both chronic and post-acute care patients. Pain is often unrecognized, especially for the most cognitively impaired residents.[21]

Nationally, almost 11% (range of 7% to 29.3%) of long-stay residents experiencing pain are reported by staff to have moderate or excruciating pain during a 7-day period. Seventeen States report greater percentages of residents in pain than the national average (see Figure 15C). This measure is very limited as a quality measure because it only counts the percentage of residents with pain symptoms; it does not directly measure the facility efforts to control or reduce the pain.

Activities of Daily Living

The functional capacity to perform ADLs declines naturally with many disease states, but it is not an inevitable consequence. There are intervention programs nursing homes can provide to residents to minimize the rate of decline in ability.[22,23,24,25] This particular measure focuses on four ADLs (bed mobility, transfers, toilet use, and eating), termed "late-loss", because these are generally the last four ADL functions to be lost.[vii] Nationally, 15.4% (range of 10.4% to 24.5%) of long-stay patients experience a loss in ability to perform at least one of four late-loss ADLs. Although there is no clinical benchmark rate, there may be opportunities for preventing decline in late-loss ADLs. Fifteen States are doing better at preventing this decline than the national average, and 11 States are doing worse.

Pressure Sores

Prevention and treatment of pressure sores in nursing homes is a quality of care dimension subject to Federal regulations. Pressure ulcers are defined as any lesion caused by unrelieved pressure resulting in damage to the underlying tissue. Lesions are classified according to stage of tissue damage, with Stage 1 being the least serious and Stage 4 being the most serious. Pressure sores are associated with considerable morbidity and a fourfold risk of death among the geriatric population.[26]

The incidence of pressure sores may be minimized but not totally eliminated with proper prevention practices,[27] and there may be opportunities to improve the treatment of pressure sores.[28,29]

The national prevalence rate for pressure sores (Stages 1 to 4) for long-stay residents is 8.5%.[viii] This rate ranges in States from about 5% to 12%. Fifteen States have higher prevalence rates for pressure sores, and 21 States have lower rates than the national average. The State rate for pressure sores is unlikely to be zero since not all facilities can achieve zero pressure sore rates given the fact that some pressure sores cannot be prevented among high-risk residents.

[vii] This general pattern of ADL loss has been studied by Cohen-Mansfield, et al. Temporal order, 974-8, and Katz, et al. Studies of illness, 914-9.

[viii] Although patients with pressure sores at nursing home admission are excluded, their subsequent MDS reassessments are included in the numerator if the sore has not healed.

Providing Quality Care to Post-Acute Care (Short-Stay) Nursing Home Residents

Pain

It is estimated that nationally one-fourth of all short-stay nursing home residents reported daily pain. There is considerable variation among the States, ranging from 15% to 48%. Thirteen States have a lower occurrence of daily pain in residents than the national average, and 17 States have a higher occurrence (see Figure 15B).

A larger percentage of short-stay patients report pain compared with long-stay residents. Part of this difference may be attributed to the types of diagnoses and procedures among the post-acute care patients (e.g., more pain as a result of surgery or post-fall trauma). It is also more difficult to detect pain in long-stay patients with dementia.[21]

Walking Maintenance or Improvement

This measure demonstrates achievement of a rehabilitative goal for many short-stay patients. Walking plays a vital role in performing daily activities, and it is important in maintaining and preventing functional decline. Often, post-acute care patients are temporarily or permanently impaired as a result of surgical procedures or other injuries. The national rate is 30% of patients with improved walking within 2 weeks, with some variation among States (range of 21.7% to 38.7%). Ten States have better walking rates than the national average, and 13 States have worse walking rates. With a 30% average, it is possible that the time frame for measurement (between day 5 and day 14 of a PPS assessment) may be too short to capture maximum improvement in walking for many short-stay residents. Also, an interactive effect could exist with pain whereby if pain is resolved or reduced in the patient, walking improvement might be more likely to occur. Early mobilization and adequate pain control are deemed to be goals for many hip fracture patients to improve their ability to walk.[30]

Delirium

Delirium is an acute state of confusion, with changes in awareness, attention, cognition, and perception, which often fluctuate over the course of a day. Delirium represents a sudden and significant decline in previous level of functioning. Not all cases are preventable. Delirium is a complex condition and is considered an acute medical emergency, for which the underlying cause needs to be promptly treated. However, because of its broad range of signs and symptoms, delirium is often misdiagnosed as a psychosis, depression, or dementia. If left misdiagnosed or untreated, delirium can significantly increase the need for nursing care, decrease ability to function, delay rehabilitation, and increase length of stay.

The national prevalence rate for residents with delirium symptoms is less than 4%, ranging from 1.6% to 7.1%. There is no clinical benchmark rate for delirium.

Providing Quality Care to Home Health Patients[ix]

There are national data for the selected OASIS measures for 2 years (2001 and 2002). However, since the differences are small (1% or less) between the 2 years, this report provides the national rates for 2002 and rates for each State to illustrate variation in performance. In the home health areas measured by OASIS data, there are no established target clinical benchmarks although each agency can view their rates as baselines for continuous quality improvement.

Meeting Basic Daily Needs[x]

Bathing is an important ADL to maintain independence in the community. Almost 57% of all episodes[xi] that can achieve improvement[xii] achieved improvement in this ADL. State rates ranged from 51% to 65%, with 25 States below the national average (see Figure 15D).

Management of oral medications is another area where there are opportunities for improvement. The national average was 35%, with States ranging from 25% to 43%. Thirty States were below the national average (see Figure 15E).

Upper body dressing is an area where 61% of episodes showed improvement, and there was less variation in rates among the States (range of 56% to 65.8%).

Because not every patient can be expected to improve, the measure set includes a stabilization measure to indicate the percentage of patients that stayed the same or did not decline. Almost 91% of episodes did achieve stabilization[xiii] in bathing, with States ranging from 88.5% to 96%.

Getting Around

This category contains four distinct measures for describing how well a home health patient can get around his or her home. Nationally, one-third of episodes showed improvement in walking or moving around. Fourteen States did significantly better than the national average, while 22 States did significantly worse. Three of the measures—"improving in getting to and from the toilet without help," "improving in getting in and out of bed without help," and " having less pain when moving around"—had national average rates between 50% and 60%. However, the measure for "pain when moving around" had more variation among the States, with 31 States achieving less than the national average.

[ix] Home health data are from the Center for Health Services and Policy Research, University of Colorado, from OASIS data, available at: http://cms.hhs.gov/researchers/reports/oasis02/default.asp.

[x] Across these measures, different scales are used. For example, management of oral medications is measured on a three-point scale, while bathing has six levels. This may be one reason for the big difference in improvement rates between bathing (57%) and oral medications (35%).

[xi] Episode is defined as the period of start of care to home health agency discharge or transfer to inpatient facility.

[xii] A person is not included if he or she is at the highest level and cannot improve any more. See the Measure Specifications Appendix.

[xiii] A person is excluded from stabilization measures if he or she is at the lowest level and cannot decline any more. See the Measure Specifications Appendix.

Physical Health

About half of the episodes experienced a decrease in shortness of breath (53%) and urinary incontinence (47%). Eighteen and 22 States showed less improvement than the national average for shortness of breath and urinary incontinence, respectively.

Mental Health Status

About 40% of episodes experienced improvement in patients being confused less often. The rates of improvement in States ranged from 30% to 48%, with 23 States showing less improvement than the national average.

Acute Care Hospitalization

Overall, 28% of all home health episodes had an admission to an acute care hospital. State rates range between 21.5% and 35.3%, with 21 States having worse rates (i.e., higher) than the national average (see Figure 15F). Some of these hospitalizations may represent good quality home health care, i.e., serious health problems are recognized by the home health agencies, and the patient is appropriately hospitalized. Also, this measure, as defined in OASIS, may also include some scheduled admissions, such as for elective surgery or chemotherapy, or it may include hospitalizations that may not be avoidable due to patient frailty.

What We Don't Know

National data are available on certain key aspects of nursing home care because uniform data collection has been mandated in Medicare and Medicaid certified facilities since 1990. More recently, the government has required home health care reporting using uniform OASIS data for most adult patients. Thus, certain key outcomes can be tracked in home health as well. However, these areas, such as those reported in this section, are only a portion of the spectrum of care required by the frail elderly and other people who need long-term, post-acute, and palliative care services. Improvements can be made in our national tracking in this area. For example, the home health data used in this report largely represent the Medicare and Medicaid populations receiving skilled home health care (92%); so it is unknown how representative these data may be for quality of care for other home health patient populations.

National quality measurement of long-term care and home health care poses special challenges. There are other age groups besides the elderly who use home health and nursing home services. Although both the MDS and OASIS data are collected for these age groups, the quality measures are not disaggregated by age because, on average, groups other than the elderly constitute only a small proportion of nursing home residents and home health patients. Although the numbers for these measures may be too small to be reported separately, it is not known if quality outcomes may vary by age groups. In addition to distinct age groups, other groupings exist for which data are not always available or analyzed (e.g., short- and long-term home health patients, reason for entering care, diseased condition trajectory). Finally, clinically achievable benchmarks have not been identified for some of the measures in this section (e.g., late-loss ADL decline, delirium, and walking improvement).

A number of MDS and OASIS data limitations exist.[31,32] The nursing home and home health measures are based on patient assessment data reported by the nursing facilities and agency providers. It is, therefore, possible that facility or agency reports may not always accurately reflect the real prevalence of a condition. For example, it is likely that pain in nursing homes is underestimated because MDS data are completed by staff and pain may be unrecognized.[20] The MDS data only identify residents with pain or suspected to have pain; they do not identify efforts in controlling the pain. Patients may also differ in their acceptance of pain medication for personal or cultural reasons. Finally, staff in some nursing homes may do a better job of checking for pain than in others; lower rates may be misleading. Lower rates may also be misleading for pressure sores. For example, facilities that closely monitor for skin changes or those who serve a more disabled population may actually have higher rates than facilities that do not closely monitor. In addition, determination of Stage 1 pressure sores is known to be the least reliable of all stage determinations.

Post-acute care measures entail issues unique to their population. The post-acute measures only include residents accessing their Medicare Part A benefit; those enrolled in Medicare HMO coverage are not included. For some nursing homes with large or active post-acute care units, this population can constitute a majority of their admissions. Small sample sizes are an issue for post-acute measures, i.e., they exclude facilities with less than 20 patients over a 6-month period; thus, there is no information on nursing homes with small numbers of residents. This minimum denominator size results in about 40% to 45% of facilities being excluded. The short timeframe for the post-acute care measure that calculates change between the 5th and 14th day may make the rates seem lower than expected. Furthermore, in terms of data limitations, many post-acute care residents are excluded because they are discharged before getting a second assessment.

Some controversy exists as to whether the nursing home measures have been sufficiently validated to be considered as a more global measure of quality care, rather than as indicators of potential quality problems.[33] In addition, there is some concern about the appropriateness of the risk adjustment methodology used.[34] HHS is continuing to work on refining measures and considering alternative risk adjustment methods. In the home health area, there is variation among outcome measures in how well risk adjustment works using current methods, i.e., some measures are better risk adjusted than others.[xiv]

The selected nursing home and home health measures do not represent all possible key domains,35 such as satisfaction with care or quality of life. For these two domains, no national data yet exist. Some States, however, have begun collecting resident and family satisfaction data.19 Staffing levels in nursing homes and the overall shortage of nurse aides are important issues;36 however, there is not sufficient evidence on thresholds to make a link with quality. HHS is currently reevaluating its approach to assessment and data collection in post-acute and long-term care. In particular, developments in electronic records will enhance data collection in these settings. CMS also has a program for the refinement and evolution of OASIS and OBQI.

[xiv] See Shaughnessy, et al. OASIS, for a summary of the risk-adjustment methodology, including a discussion of ongoing research to improve risk adjustment.

This program involves monitoring issues and conducting ongoing applied research for improving OASIS, outcome reporting, outcome measures, risk adjustment, and OBQI applications.

What Can Be Done

A number of strategies may be considered for improving quality of long-term care.[37] Some of the most common strategies include:

- Providing consumers with more information.
- Developing and implementing practice guidelines.
- Developing and improving approaches to quality.
- Improving information systems.

In November 2001, HHS announced the Quality Initiative, a commitment to ensure quality health care for all Americans through accountability and public disclosure. The initiative, led by CMS, has two components: 1) to empower consumers with quality of care information to make more informed decisions about their health care, and 2) to stimulate and support providers and clinicians to improve the quality of health care.

The Quality Initiative was launched nationally in the fall of 2002 for nursing homes. As part of the information component, CMS's Nursing Home Compare[xv] began reporting quality measures on all certified nursing homes in November 2002. In May 2003, Home Health Compare began reporting measures for certified home health agencies in eight States and started national reporting in the fall of 2003. These measures are also intended to motivate nursing home facilities and home health agencies to improve care.

For the second component of the Quality Initiative, CMS has contracted with two Quality Improvement Organizations— one for nursing homes and one for home health care—to lead and support other QIOs in every State in implementing quality improvement objectives for the specific CMS quality measures. For nursing home care, the QIOs are working with a volunteer group of 15% of nursing homes nationally to help them implement a system of quality improvement within their organization for three to five of the quality measures. For this subset, QIOs are bringing nursing home teams together for training sessions in quality improvement and for sharing best practices, as well as working with nursing homes between training sessions to provide technical assistance to nursing home teams. QIOs are also working closely with other State organizations to conduct State and regional educational sessions and provide educational materials to help improve quality of care for each of the measures. Home health care is a new setting for QIO activities, and QIOs are working with Medicare certified agencies to teach them how to implement and manage continuous quality improvement systems by using the Outcome-

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[xv] Nursing Home Compare at www.medicare.gov/Nhcompare/Home.asp provides information about every Medicare-certified nursing home in the country.

Based Quality Improvement system. QIOs will work with the agencies on an ongoing basis to assist them in interpreting quality data, selecting the most appropriate areas for improvement, developing plans to improve care and monitoring, and evaluating patient outcomes over time. As a resource to providers and QIOs, the Medicare Quality Improvement Clearinghouse at www.medqic.org, and another site, www.obqi.org, have links to a number of guidelines, educational tools, interventions, and other resources that have been developed for many key areas in nursing home and home health care.

In the area of home health, two OBQI demonstration projects in 28 States found that the OBQI process had an impact on patient outcomes as measured by OASIS. The relative rate of decline in hospitalization was 22%, and the rates of improvement for other targeted home health outcome measures averaged between 5% and 7% per year.[38]

Implementation of guidelines and practice protocols can improve quality in nursing homes,[39,40] but there are some barriers to sustained and widespread use of the guidelines and protocols. These protocols may not always be feasible with current nursing home staffing numbers, staff educational levels, and turnover.[41,42]

The researchers recommended that staffing needs be estimated for implementing guidelines to do realistic quality change planning.

For nursing home and home health care, the strategy of improving information systems for quality monitoring has been combined with the regulatory oversight process. For several years, the MDS data have been used by State survey agencies to identify potential problems as part of their onsite nursing home evaluations, which occur at least once during a 15month period or as a result of a complaint being investigated. The evaluations ensure that the nursing home residents receive quality care and services in a safe and comfortable environment in accordance with rules established by CMS. As of May 1, 2003, State survey agencies began using data generated by OASIS to help identify areas of focus or the types of patients to include in the sample selection in their home health evaluations. These evaluations generally are conducted at least once every 36 months.

There are some studies and evaluations underway on how to change the culture and working conditions in the nursing home and home care settings,[xvi] and some studies on small scale initiatives have been completed.[43] The expectation is that these work and culture changes will result in improved quality of care for patients.[44]

[xvi] AHRQ grant HS11962-01, “Working Conditions and Adverse Events in Home Health Care,” AHRQ grant HS11523-01, “Patient Safety in Home Care,” and AHRQ grant HS12028-01, “Nursing Home Working Conditions and Quality of Care.”

Figure 15. National variation in nursing home and home health care

Figure 15a. Percent chronic care nursing home residents with physical restraints

Chronic Restraints

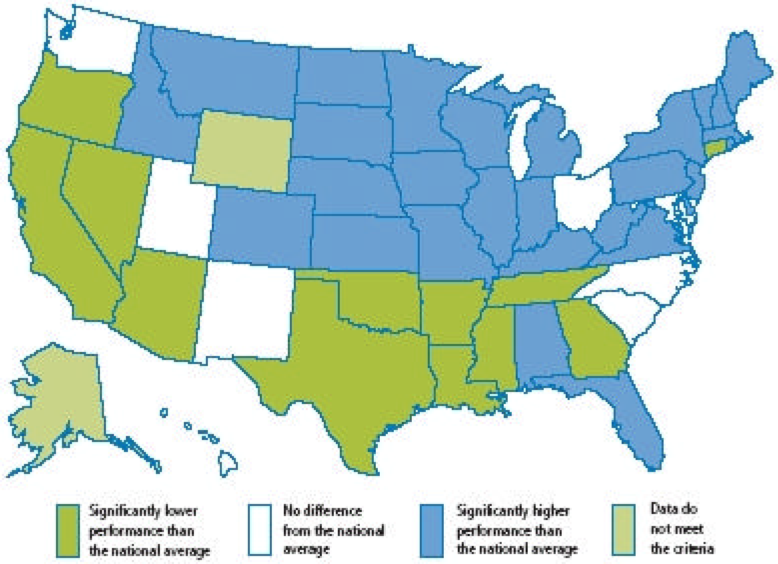


Figure 15b. Percent post-acute care nursing home residents with pain that was excruciating at any time or moderate during week among residents experiencing daily pain

Post-acute Pain

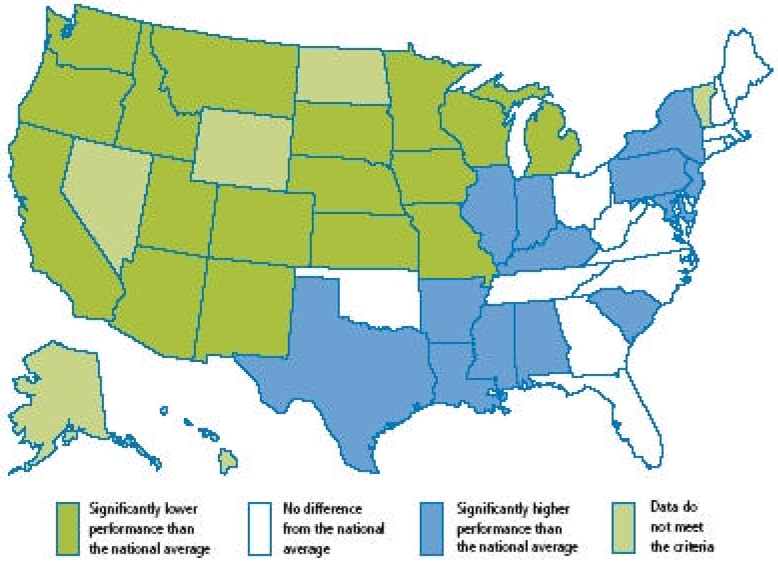


Figure 15. National variation in nursing home and home health care (continued)

Figure 15c. Percent chronic care nursing home residents with pain that was excruciating at any time or moderate during week among residents experiencing daily pain

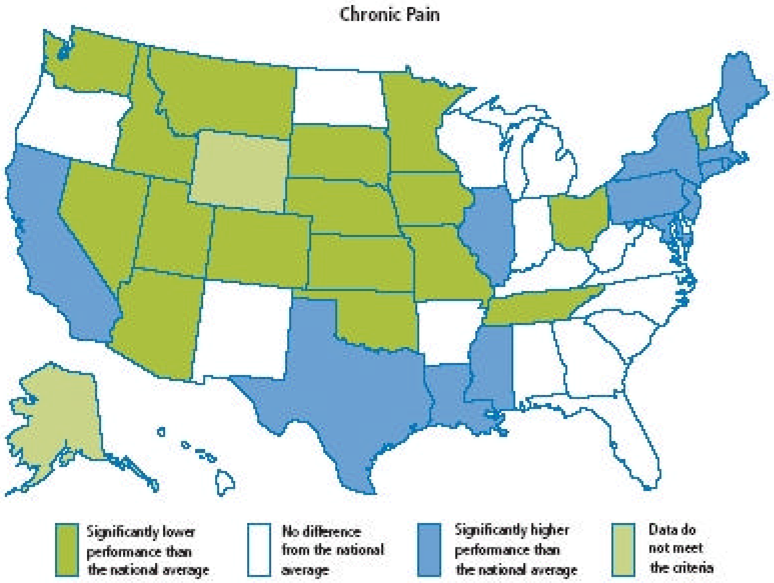


Figure 15d. Improvement in bathing

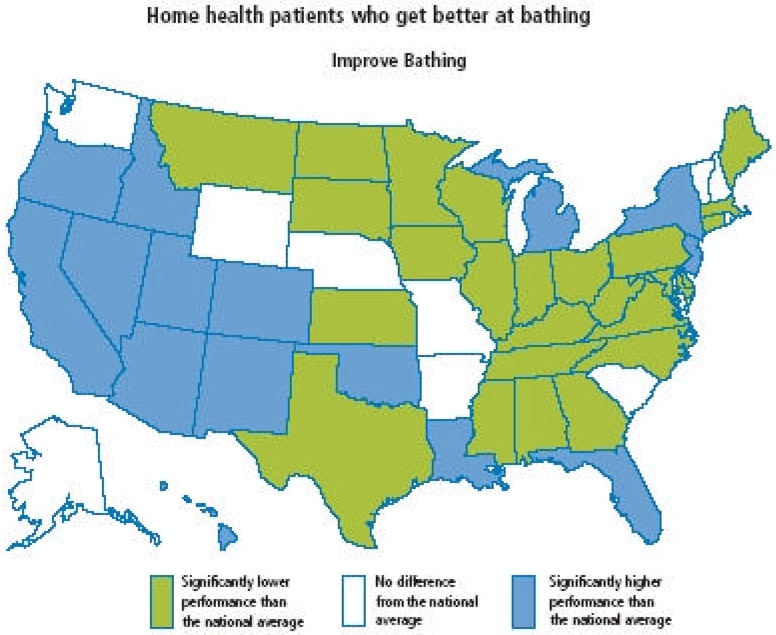
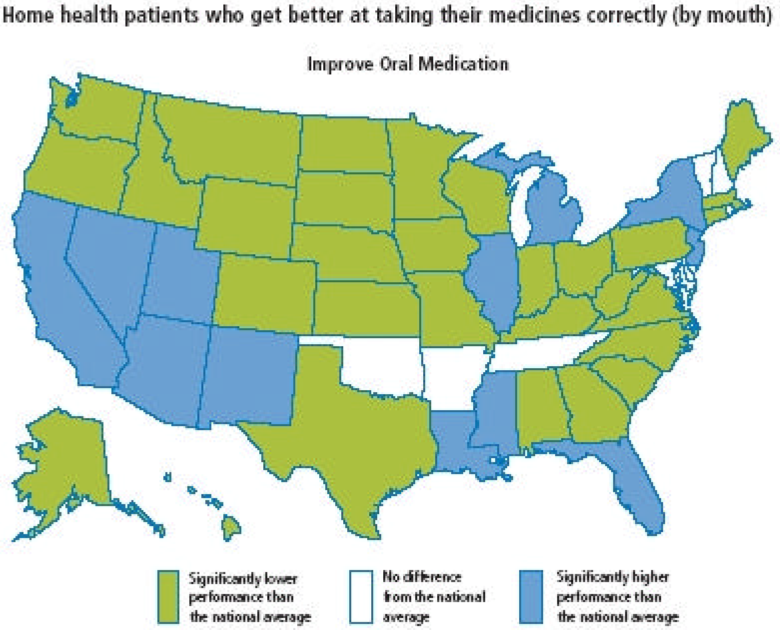


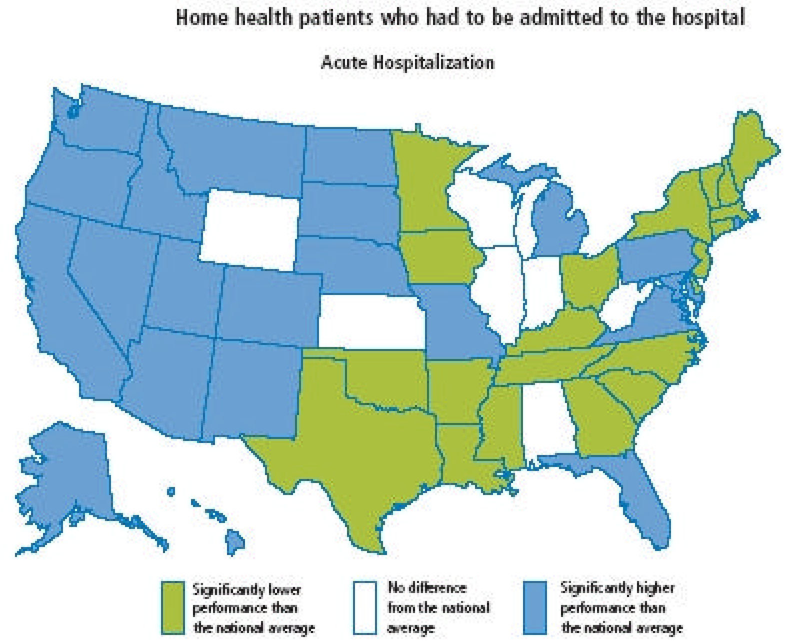
Figure 15. National variation in nursing home and home health care (continued)

Figure 15e. Improvement in management of oral medications


Home health patients who get better at taking their medicines correctly (by mouth)

Improve Oral Medication

Figure 15f. Acute care hospitalization


Home health patients who had to be admitted to the hospital

Acute Hospitalization

List of Measures

Nursing Home and Home Health Care

Measure Title	*National/State*[xvii]
Nursing facility care:	
Chronic care: % of residents with pain	Table 1.87
Chronic care: Late-loss ADL worsening	Table 1.88
Chronic care: Infections prevalence	Table 1.89a (UTI, some states) Table 1.89b (all infections, more states)
Chronic care: Stage 1-4 pressure ulcer prevalence	Table 1.90a Table 1.90b (sheet=w/risk adj)
Chronic care: Restraint use prevalence	Table 1.91
Post-acute care: Failure to improve/ manage delirium symptoms	Table 1.92a Table 1.92b (sheet=w/risk adj)
Post-acute care: % of residents with pain	Table 1.93
Post-acute care: Improvement in walking	Table 1.94
Home health care: Meeting the patient's basic daily needs	
Outcome: improvement in upper body dressing	Table 1.95
Outcome: improvement in management of oral medications	Table 1.96
Outcome: improvement in bathing	Table 1.97
Outcome: stabilization in bathing	Table 1.98
Improvement in getting around	
Outcome: improvement in transferring	Table 1.99
Outcome: improvement in ambulation/locomotion	
Outcome: improvement in toileting	
Outcome: improvement in pain interfering with activity	Table 1.102

Note: See Tables Appendix for tables listed above.

[xvii] National and State rates are contained in same table.

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Chapter 4. Patient Safety

Key Findings

This report documents progress and substantial gaps in patient safety, although they are difficult to track because of limited data. For example:

- Data collected on hospital-acquired infections from 1995-2002 show that some of the Healthy People 2010 targets for eliminating infections acquired in intensive care units (ICUs) have been met or nearly met.
- Data on adverse events due to medical care show that the rate of complications due to anesthesia is only 0.72 per 1,000 surgical discharges.
- Data on complications of care show that the rates for accidental laceration or puncture during a procedure rose from 2.4 to 3.4 per 1,000 discharges from 1994 to2000.
- In terms of medication safety, 77.8% of people with a usual source of care in 1996 and 81.7% in 2000 said that their usual source of care asked them about other medication use in order to prevent drug interactions.

Background and Impact

Medical errors sometimes cause significant and deadly harm to patients. Researchers found that, in some hospitals in New York, Utah, and Colorado, injuries resulting from medical management occurred in about 2% of all hospitalizations with up to 14% of these injuries resulting in death and up to 7% resulting in permanent disabilities.[1,2,3,4] Researchers also revealed that preventable adverse drug events occurred in about 2% of admissions in some Utah hospitals[5] and Boston teaching hospitals.[6] Based on such findings, a 1999 report estimated that 44,000 to 98,000 Americans die each year as a result of medical errors, making it the eighth leading cause of death, higher than the number of deaths from motor vehicle accidents.[7] The report also estimated that medical errors cost as much as $29 billion annually in lost income, disability, and health care costs.

Recently, medical mishaps have also gained a great deal of attention in the headline news. In one case, a heart transplantation in a highly acclaimed university hospital resulted in the death of an organ recipient because of mismatched blood type between the recipient and the donor.[8] During this case, the medical practitioners failed to confirm the blood types, leading to the type O patient receiving a type A organ. In another case, an organ donor died 3 days after undergoing surgery to donate a portion of his liver to his ailing brother.[9] The ensuing investigation identified no problems during the operation itself, but found a series of failures and errors in post-surgical care by an overburdened, junior staff.

Any practical approach to improving patient safety must start by documenting incidences of various types of errors and injuries.[7,10] Reporting medical errors and injuries will raise awareness, facilitate understanding of risks and injury, aid in developing preventive strategies, and provide yardsticks to track progress.

How the NHQR Measures Patient Safety

The concept of patient safety as a quality measure is evolving. Patient safety is defined as freedom from accidental injury due to medical care,[7,11] or absence of medical errors,[12,13] or absence of misuse of services.[14,15] These concepts cover a variety of injuries and errors occurring during any stage in the processes of care, including medical errors that are narrowly avoided (termed near misses) and errors that cause harm to patients. In addition to the lack of a single typology, documenting medical errors and injuries is further hampered by the lack of standards or an infrastructure for systematic data collection on errors.

This report documents incidences of medical errors and injuries with three sets of indicators. They reflect a narrow range of medical errors or injuries for which nationwide data are currently available.

AHRQ Patient Safety Indicators

The recently released AHRQ Patient Safety Indicators (PSIs) include 20 indicators focused on iatrogenic conditions and postoperative complications such as accidental laceration during a procedure, blood clots in the lungs following surgery, fracture following surgery, and birth-related injuries, using readily available hospital administrative data.[16,17] Some of the 20 indicators, such as a foreign body left in the patient during a procedure, unequivocally reflect medical errors in hospitals. Others, such as postoperative hemorrhage and blood clots, may be due only in part to failure of planned treatment, and some cases may not be avoidable.

This report documents national incidence rates for 1994, 1997, and 2000 and for some subpopulations using hospital discharge records from the Healthcare Cost and Utilization Project Nationwide Inpatient Sample, a nationally stratified sample of U.S. hospitals (nearly 1,000 hospitals) selected from 28 States (in 2000). The incidences are identified from standard *International Classification of Diseases, Ninth Revision, Clinical Modification* (ICD-9-CM) codes used by hospitals to record diagnoses and procedures in hospital discharge records or administrative data for each patient treated. Many benefits are associated with the use of administrative data, including ease of access and low cost. However, there are some limitations, primarily coding across organizations and completeness in coding (some relevant diagnoses and procedures may be unrecorded). Furthermore, the ICD-9-CM system was not developed to report medical errors or injuries, and as such, it is not as clinically precise or complete as would be desired for this purpose.[16,18,19,20,21,22]

CDC's National Nosocomial Infections Surveillance

National Nosocomial Infections Surveillance (NNIS) is a voluntary, hospital-based reporting system started in 1970 to monitor hospital-acquired infections and to guide the prevention efforts of infection control practitioners.[23,24] This system uses uniform case definitions and data collection methods to collect data from about 300 hospitals and establishes risk-adjusted benchmarks for hospital-acquired infection rates.

NNIS data from 1998-2002 are used to report respiratory tract, urinary tract, and bloodstream infections in ICUs and in low birthweight infants. NNIS is not nationally representative. Due to the nature of voluntary reporting, NNIS may underestimate incidence rates to some extent.[25]

MEPS Data on Medication Use

The Medical Expenditure Panel Survey, a nationally representative survey of households, reports data on health care expenditures and services, including medication use. This report tracks two measures from MEPS. The first measure reports the percentage of people with a usual source of care who reported that their usual source of care usually asked about prescriptions from other providers to avoid potentially harmful drug interactions. The second measure reports incidence rates (1996 and 1998) of 33 medications that should be used in limited circumstances in the elderly. The 33 medications are further separated into three categories: 1) 11 medications that according to a recent study should always be avoided in the elderly; 2) 8 medications that are appropriate in rare circumstances, and 3) 14 medications that may sometimes be indicated but are often misused.[26] When interpreting the results for these measures, it is important to note that there are differing opinions about what are or are not inappropriate medications for the elderly. Conflicting opinions occur even in guidelines and physicians' references for medication use.[27]

How the Nation Is Doing[i]

Healthy People 2010 sets targets for six measures of infections acquired in ICUs. Except for these six measures, there are no national objectives against which to compare incidence rates reported here to determine how the Nation is doing in patient safety. Nevertheless, the available reported measures suggest targets for improvement.

Hospital-Acquired Infections

Infections acquired in hospitals and ICUs are common, with about 2 million patients infected each year; one-fourth of the infections occur in ICUs.[28,29] Nearly 90,000 patients die of nosocomial infections each year, and the infections have an annual cost of approximately $4.5 billion.[30]

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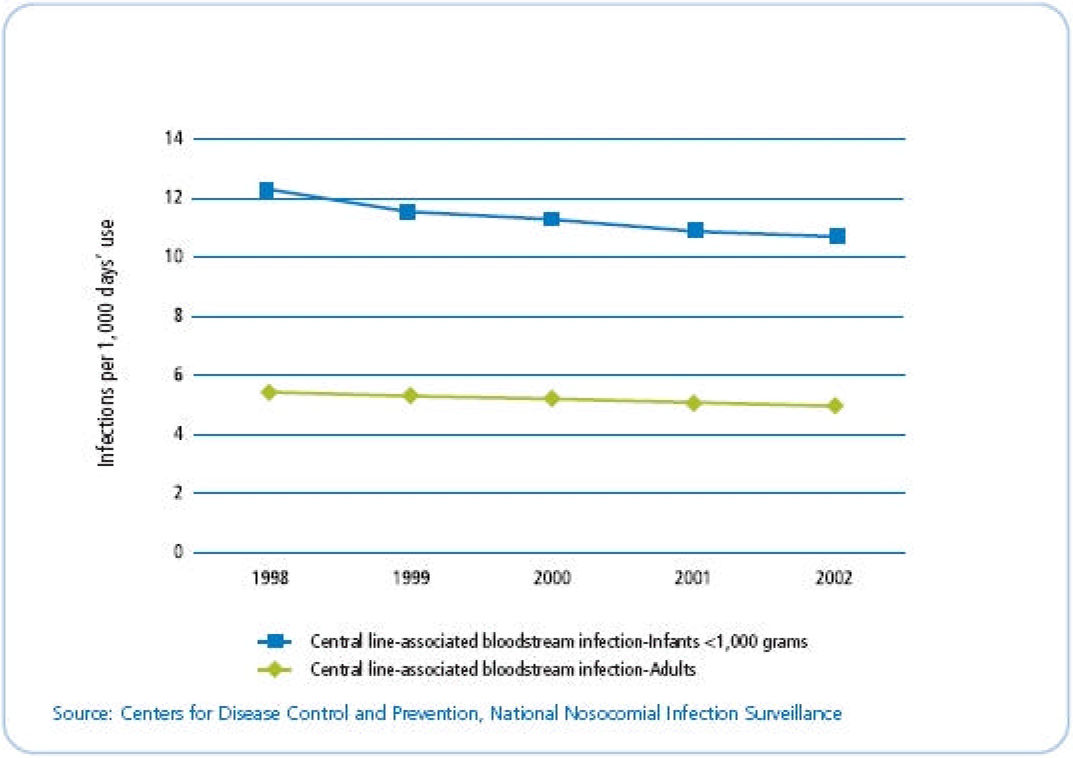
[i] Adjusting for known contributing factors, such as gender, age, and insurance status (multivariate analysis), would allow for more detailed exploration of the data, but this generally was not feasible for this report. Any adjustments that were done are noted in the detailed tables. The data presented in this report do not imply causation.

NNIS data show that hospital-acquired infections in some types of ICUs have gradually declined from 1998 to 2002 (see Figure 1). By the year 2002, the targets set for Healthy People 2010 for central line-associated bloodstream infections (5.0 per 1,000 days' use) in adults and for infants weighing 1,000 grams or less at birth in ICUs (11.0 per 1,000 days' use) had been met.

Figure 1. Nosocomial infections in intensive care



Source: Centers for Disease Control and Prevention, National Nosocomial Infection Surveillance

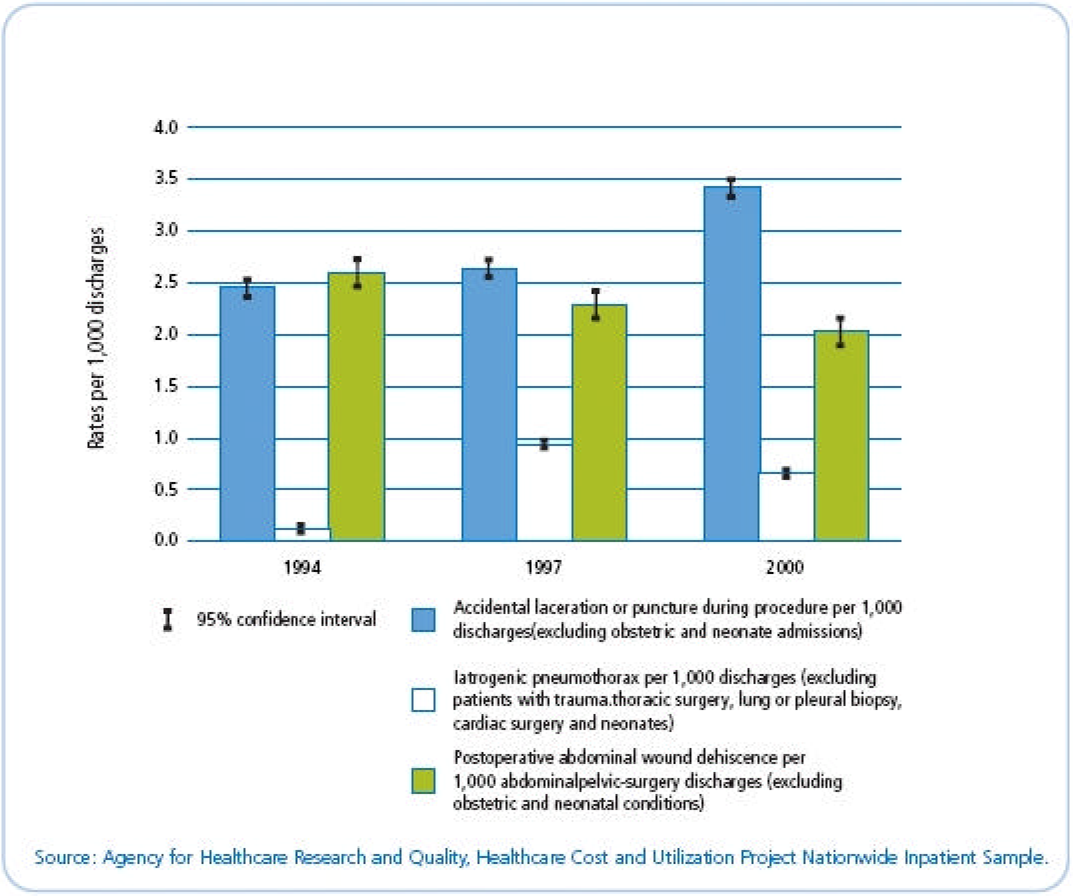
AHRQ PSIs and HCUP data show that, from 1994 to 2000, hospital-acquired infections after infusion, injection, transfusion, and vaccination increased from 1.37 to 2.01 per 1,000 hospital discharges. Postoperative sepsis also increased from 0.69 to 11.26 per 1,000 elective-surgery discharges with length of stay longer than 3 days.

Injuries or Adverse Events Due to Medical Care

AHRQ Patient Safety Indicators flag some events that are more likely to be the result of technical expertise or human errors rather than system-level errors. Foreign objects left in the patient during procedures (usually sponges or surgical instruments) is one such measure, and guidelines and procedures exist to prevent such events.[31,32] Iatrogenic pneumothorax (lung puncture) may occur during insertion of a central line, thoracic surgery, thoracentesis, or pleural or transbronchial biopsy.[33] Some of the ruptures of surgical wounds may be avoided by thorough cleaning, control of bleeding, and proper suture technique.34 Transfusion reactions may be due to unrecognized clerical errors.[35]

For 1994, 1997, and 2000, incidences of iatrogenic pneumothorax (excluding complicated cases such as trauma and thoracic surgery and adjusting for patient risk) ranged from 0.16-0.96 per 1,000 discharges, with the highest rate occurring in 1997. The rates for accidental laceration or puncture during a procedure (again controlling for risk) were 2.44 to 3.40 per 1,000 discharges rising over the period. For wound dehiscence (rupture of surgical wounds) following abdominopelvic surgery, controlling for risk, the rates declined over the period from 2.58 to 2.06 per 1,000 such surgical discharges(see Figure 2). Foreign body left in during procedure and transfusion reactions were less frequent, at about 0.09 per 1,000 discharges for foreign bodies left in each year and at less than 0.01 per 1,000 discharges for transfusion reactions each year.

Figure 2. Adverse events due to medical care



Source: Agency for Healthcare Research and Quality, Healthcare Cost and Utilization Project Nationwide Inpatient Sample.

Complications of Care

Complications of care vary in nature and seriousness. Some complications are affected significantly by patient severity of illness, comorbid conditions, and complexity of treatment and may not be preventable.[36,37,38] However, adequate care or care provided according to current knowledge or evidence may prevent some of these complications.[39] For example, complications of anesthesia have been substantially reduced by adherence to process guidelines.[40]

A substantial number of complications were identified using AHRQ PSIs and HCUP data. Over the period studied (1994-2000), the numbers of postoperative incidents occurring per 1,000 surgical discharges for the following complications were:

- Hemorrhage or hematoma—about 2 per 1,000 surgical discharges.
- Pulmonary embolism or deep vein thrombosis—about 8 per 1,000 surgical discharges.
- Respiratory failure for elective surgical patients without respiratory disease— about 4 per 1,000 surgical discharges.
- Physiologic and metabolic derangements for elective surgical patients— about 1 per 1,000 discharges.
- Complications of anesthesia — less than 1 (about 0.7) per 1,000 surgical discharges.
- Hip fractures after surgery for patients 18 and older who were not susceptible to falling— less than 1 (about 0.8) per 1,000 surgical discharges.

Pressure sores (measured for patients who were hospitalized for more than 4 days who were not paralyzed or admitted from long-term care facilities) were more frequent, about 20 per 1,000 discharges, rising from 17 to 22 over the period 19942000. These rates are generally lower than those reported in studies that focused on these specific conditions in single institutions using medical record review.[41,42,43]

Birth-Related Trauma

Birth trauma refers primarily to injuries to the neonate's head and neck as a result of labor and delivery. These traumas are often associated with abnormal fetal presentations, abnormal fetal descent, and large infants that require the application of forceps or vacuum extraction. Birth trauma occurred in about 7-15 per 1,000 live births between 1994 and 1997 and fell to about 7 per 1,000 in 2000, consistent with previous reports.[44] Obstetric trauma, mostly injuries to genital tract and the anal sphincter, occurred in about 8% of women delivering without instrument assistance, 23% of women with instrument-assisted vaginal deliveries, and 0.6% of cesarean section deliveries from 1994-2000. These rates are lower than, but close to, previously published reports.[45]

Potentially Avoidable Death

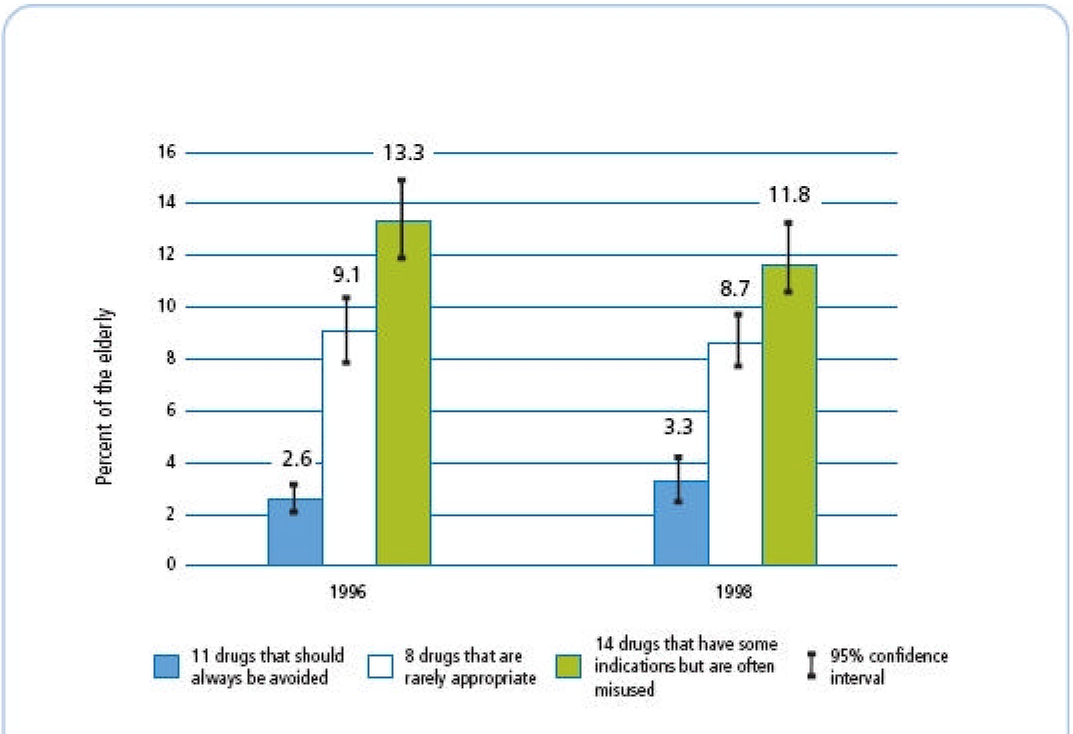
Mortality rates, whether risk-adjusted or condition-specific, are not considered definitive measures of quality of care in hospitals. Death rates may increase with increasing severity of illness. Moreover, a full accounting and adjustment for severity of illness is difficult to achieve.[46,47] Nevertheless, high mortality rates among patients in diagnosis-related groups (DRGs) that normally have low mortality rates (less than 5%), raise concerns.[48] The mortality rates for patients in low mortality DRGs are significantly higher for the elderly and men.

Medication Safety

Prescribing medications that are not appropriate or with potentially harmful drug-drug interactions poses a threat to patient safety.[49,50,51,52] One strategy is to ask patients what medications they currently are taking before prescribing additional medications. Data from MEPS show that, of people with a usual source of care, 77.8% of the respondents in 1996 and 81.7% in 2000 said that their usual source of care asked them about other medication use.

Another line of defense is to avoid a contraindicated drug. The same survey shows that, in 1996 and 1998, about 1 in 5 elderly Americans was prescribed at least 1 of the 33 drugs considered potentially inappropriate for the elderly. About 3 in 100 elderly had 1 of 11 drugs according to this study that should always be avoided by the elderly (see Figure 3).[26,50] These rates are consistent with results from previous studies.[26,53,54,55,56,57,58,59,60,61,62]

Figure 3. Inappropriate drug prescription for community-dwelling elderly Americans



Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey.

What We Don't Know

Today, health care is much safer than at the time Florence Nightingale published her *Notes on Hospitals* in 1863, when she attributed many deaths in English hospitals to unsanitary conditions[63] or, in modern terms, nosocomial or hospital-acquired infections. However, medical care has become increasingly complex and more concerns have been raised about safety. Despite recognition of medical errors and injuries as a cause of death and patient safety as an area for improvement,[7] the overall approach to patient safety (e.g., focusing on medical errors or on medical injuries)[11,13] and definitional issues (e.g., what is considered preventable)[64] continue to be debated. Currently, few data exist to provide a national picture of patient safety. Consequently, little is known about the prevalence of medical errors and injuries in the United States.

This report presents incidence rates only for selected types of medical errors and injuries associated with the delivery of care. Not all such incidences that are reported are preventable. Data currently available and used in this report generally are limited in what they can show and, therefore, are not sufficient to identify progress. In fact, the reported (but not actual) incidence rates may go up for some time as reporting systems become more accurate and complete.

Nonetheless, the identified incidences of medical errors and injuries associated with the delivery of care indicate room for improvement.

What Can Be Done

Some health professionals have made strides in improving patient safety. For example, anesthesiologists have managed to improve anesthesia-related mortality dramatically in the last 40 years, changing anesthesia from a hazardous undertaking to one with an exemplary safety record.[65,66] Hospital-acquired infections have also been substantially reduced over several decades.[23] The last decade witnessed sustained efforts at Federal and State levels, in collaboration with the private sector, to make health care safe. The President's Advisory Commission on Consumer Protection and Quality in the Healthcare Industry published its report in 1998, which put reducing misuses of health care at the top of the agenda for quality improvement. In November 1999, the IOM released *To Err Is Human: Building a Safer Health System*, further putting the long-existing problem into the spotlight.[7] In February 2002, HHS, under the leadership of its Quality Interagency Coordination Task Force, developed a series of programs in response to the IOM's report.[10]

In recent years, AHRQ and other Federal agencies have sponsored extensive research on patient safety, much of which has been aimed at developing systems to accurately report medical errors and injuries associated with the delivery of care. In partnership with other Federal agencies, AHRQ has developed and funded a portfolio of research projects that: 1) identify risks and hazards that lead to medical errors and the causes of patient injury associated with the delivery of health care, 2) identify and design practices that eliminate medical errors and test them to determine their effectiveness, 3) disseminate information on and educate health professionals, students, and practitioners about proven patient safety practices that reduce or prevent patient injury associated with the delivery of health care, and 4) monitor and evaluate threats to patient safety. AHRQ has sought to improve patient safety by promoting best practices, training new researchers, linking safety professionals and communication through Web-based tools, and promoting international collaboration. AHRQ has also compiled and released various safety tips for patients and health care professionals based on available evidence.

In addition, other agencies developed strategies tailored to their constituencies. The Centers for Medicare & Medicaid Services started, among many programs aimed at safety, a Medicare Patient Safety Monitoring System (MPSMS). It is a retrospective chart review system to describe the size and nature of the iatrogenic injuries associated with hospital care among Medicare beneficiaries. The Department of Veterans Affairs has implemented several programs addressing safety including the Patient Safety Improvement Awards Program, which offers positive reinforcement for those already following best practices. The VA has established four Patient Safety Centers of Inquiry, which conduct research and design reporting systems to broadcast their findings.[ii] In collaboration with the American College of Surgeons, the VA has developed a National Surgical Quality Improvement Project focusing on reducing surgical complications.

The Food and Drug Administration is developing bar-coding and databases aimed at reducing medication errors and adverse drug events. Many States have developed voluntary reporting systems and some have mandated reporting of medical injuries.[67] In the private sector, the Joint Commission on Accreditation of Healthcare Organizations has instituted Web-based data collection of sentinel events and developed standards for root cause analysis. An IOM committee is developing standards and data systems for reporting patient safety data. Hospitals, health plans, and employers are also developing programs and information infrastructures for improving safety. More recently there have been legislative efforts to create a voluntary reporting system, which explicitly promised confidentiality to hospitals and doctors and that the collected data would not be discovered through the legal system for use in malpractice suits.[68] Medical malpractice reform is also gaining momentum to ensure that malpractice litigation safeguards patient safety and is not a barrier to accurate reporting of medical errors.

These developments will help standardize definitions, terminology, measurement, and databases in patient safety. In the meantime, benchmarks and performance objectives will be formulated to assess patient safety and best practices to prevent medical errors and injuries. Future editions of this annual report may be able to take advantage of progress on these multiple fronts to provide a more accurate assessment of the safety of the U.S. health care system.

[ii] For more information, go to www.va.gov/OCA/testimony/27jy00PS_usa.htm.

List of Measures

Patient Safety

Measure Title	*National*	*State*
Complications of care:		
Birth trauma	Table 2.1(00)	—
Death in low mortality DRGs	Table 2.2(00)	—
Failure to rescue	—	—
Transfusion reaction and Transfusion reaction (area)	Table 2.3a (00-PSI16) Table 2.3b (00-PSI26)	—
Foreign body left in body during procedure and Foreign body left in body during procedure (area)	Table 2.4a (00-PSI5) Table 2.4b (00-PSI21)	—
Central line-associated bloodstream infections in intensive care unit patients	Table 2.5	—
Central line-associated bloodstream infections in infants weighing <1,000 grams at birth in intensive care	Table 2.6a	—
Complications of anesthesia	Table 2.7 (00)	—
Decubitus ulcer	Table 2.8 (00)	—
Iatrogenic pneumothorax and Iatrogenic pneumothorax (area)	Table 2.9a (00-PSI6) Table 2.9b (00-PSI22)	—
Infection due to intravenous lines or catheters and infection due to intravenous lines or catheters (area)	Table 2.10a (00-PSI7) Table 2.10b (00-PSI23)	—
Postoperative hip fracture	Table 2.11 (00)	—
Postoperative hemorrhage or hematoma	Table 2.12 (00)	—
Postoperative physiologic and metabolic derangements	Table 2.13 (00)	—
Postoperative respiratory failure	Table 2.14 (00)	—
Postoperative pulmonary embolism or deep vein thrombosis	Table 2.15 (00)	—
Postoperative septicemia	Table 2.16 (00)	—

Patient Safety

Measure Title	*National*	*State*
Complications of care (cont.)		
Technical difficulty with procedure and technical difficulty with procedure (area)	Table 2.17a (00-PSI15) Table 2.17b (00-PSI25)	—
Postoperative wound dehiscence and postoperative wound dehiscence (area)	Table 2.18a (00-PSI14) Table 2.18b (00-PSI24)	—
Obstetric trauma - vaginal with instrument	Table 2.19 (00)	—
Obstetric trauma - vaginal without instrument	Table 2.20 (00)	—
Obstetric trauma - cesarean delivery	Table 2.21 (00)	—
Prescribing medications:		
% of community dwelling elderly who had at least one prescription of the 33 medications that are potentially inappropriate for the elderly.	Table 2.22a (98) Table 2.22b (96)	—
% of adults who report that usual source of care asks about prescription medications and treatments from other providers	Table 2.23a (00) Table 2.23b (96)	—

Note: See Tables Appendix for tables listed above.

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Chapter 5. Timeliness

Key Findings:

- The mean time from arrival of a heart attack patient to initiation of a thrombolytic agent is 62.21 minutes. The median time is 43 minutes.
- The mean time in minutes from arrival to percutaneous transluminal coronary angioplasty (PTCA) for heart attack patients is 185.8 minutes. The median time is 108 minutes.
- About 64% of emergent or urgent visits to the emergency department in 2000 were seen in less than an hour.

Background and Impact

Timeliness refers to the ability of patients to receive appropriate medical care at the time it is needed. This encompasses two dimensions: the delivery of treatment for clinical conditions for which timing is critical; and patients' perceptions of their ability to schedule appointments and get care when they want it. This second dimension is an important but new area of study, and there is little consensus on its link to quality and how to measure and report data.

Timely delivery of appropriate care can be important for both acute and chronic conditions:[1,2,3]

- The ability of patients to obtain appropriate care for a specific problem once they have entered the health care system. This includes, for example, the ability to obtain emergency care and get appointments for routine care.[4]
- The ability of patients to receive timely care "within an episode of care and across multiple episodes of care for a single condition."[5] This involves timeliness in getting care once the patient is at the provider's site and time involved with a particular medical problem.[6]

Although problems with timeliness generally focus on the patient perspective, it is important to note as well that lack of timeliness also causes frustration and dangers for providers.

How the NHQR Measures Timeliness of Care

A variety of different indicators have been identified that might be used to measure timeliness in health care. This report presents data both on time-sensitive clinical procedures as well as patients' perceptions of the timeliness of their care. Information on the timeliness of two important clinical procedures for heart attack patients—thrombolysis and PTCA—are presented in this section.[i] Information is also presented on the timeliness of care for emergent or urgent emergency department visits using data from the National Hospital Ambulatory Medical Care Survey (NHAMCS). Information on patients' perceptions of the timeliness of their care is presented using data from the Medical Expenditure Panel Survey.[ii]

How the Nation Is Doing[iii]

The results of the 2000 survey for the measures of timeliness selected for this report are presented below. The responses show some variation among different races and ethnic groups, as well as differences based on location, age, education, income level, and a number of other characteristics. Along with the results for the overall survey population,[iv] a few of the most significant differences among various ethnic and other groups are noted.

Clinical Timeliness for Heart Attack Patients

The mean time from arrival of a heart attack patient to initiation of a thrombolytic agent is 62.21 minutes. The median time is 43 minutes. This measure is assessed for patients with ST segment elevation or left bundle branch block (LBBB) on the electrocardiogram (ECG) performed closest to hospital arrival time.

The mean time in minutes from arrival to PTCA for heart attack patients is 185.84 minutes. The median time is 108 minutes. This is assessed in patients with ST segment elevation or left bundle branch block on the electrocardiogram performed closest to hospital arrival time.

Percent of Emergent/Urgent Emergency Department Visits With a Wait Time of an Hour or More

In about 64% of emergent or urgent visits to the emergency department in 2000, patients were seen in less than an hour. About 12% of emergent/urgent visits to the emergency department in 2000 resulted in a wait of at least an hour.[v] The most significant difference for this measure is between those who live in major metropolitan areas and those who do not. In metropolitan areas, 14% of emergency department patients had to wait an hour or more, compared with 7% of patients in nonmetropolitan areas.

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[i] These measures are listed in the Heart Disease section of this report, and the detailed tables for the measures are presented in the Heart Disease section of the Tables Appendix.

[ii] These MEPS measures are derived from Consumer Assessment of Health Plans (CAHPS®) questions. More information on the measures is presented in the Measure Specifications Appendix.

[iii] Adjusting for known contributing factors, such as gender, age, and insurance status (multivariate analysis), would allow for more detailed exploration of the data, but this generally was not feasible for this report. Any adjustments that were done are noted in the detailed tables. The data presented in this report do not imply causation.

[iv] The overall survey population includes those representative hospitals eligible for NHAMCS and MEPS* participants who are members of the health plans that volunteer to participate.

[v] Due to missing values, these numbers do not total 100%.

Patient Perceptions of the Timeliness of Their Care

- Percentage of people who reported that they could always get an appointment for routine care as soon as they wanted. This rate varied by age: 43% of adults, 52% of those under 18 years of age, and 55% of those aged 65 and over reported being always able to get an appointment for routine care as soon as they wanted.

- Percentage of people who reported that they could always get care for illness/injury as soon as they wanted. In a pattern similar to the above results, 54% of adults, 52% of those under 18 years of age, and 55% of those aged 65 and over reported always getting care for an illness or injury as soon as they wanted.

What We Don't Know

There is a growing body of evidence documenting the relationship between timeliness and quality. However, these are very disparate and don't represent a national view.

It is unclear what aspects of timeliness are most important in terms of ensuring positive health outcomes. For example, is access to care most critical overall, or is it important for certain conditions and under certain circumstances? Is timeliness in getting care once in the system an important determinant of how well chronic conditions are controlled? Is timeliness with respect to particular episodes of care a key factor in outcomes for acute conditions? Answers to such questions will help to determine which measures are the most critical to track.

Also unknown is to what extent new ways of responding to patients' needs can substantially reduce delays. For example, to what extent might the use of the Internet by patients speed up the delivery of quality health care?[7]

What Can Be Done

A range of promising approaches to improving the timeliness of health care are currently being pursued. In some cases, evidence suggests that delays can be reduced by applying lessons from other industries.[8] Greater use of information technology also holds considerable promise for improving timeliness. For example, both patients and health professionals could benefit from increased use of Internet-based communication to gain immediate access to automated clinical information, diagnostic tests, treatment results, and other important information. NAMCS and NHAMCS have begun to collect data on the number of visits by e-mail and telemedicine. Eventually "e-visits" and "telemedicine" might be able to significantly improve the timeliness with which at least certain aspects of health care are effectively provided.[9] In addition, the adoption of electronic medical records (EMRs), like those developed by the Veterans Health Administration, can greatly aid practitioners, researchers, and patients. For example, by providing such conveniences as automatic reminders to schedule patient tests and visits and comprehensive patient information at a glance, EMRs reduce the likelihood of missing important followup care, such as timely referrals to specialists. Additional potential benefits of EMRs include reducing redundant information collection and facilitating smooth transitions among providers and systems.

List of Measures

Timeliness

Measure Title	*National*	*State*
Basic timeliness:		
% of people who report that they have a usual source of medical care, by place of care	Table 3.1a (00) Table 3.1b (00; hosp ed) Table 3.1c (00; poor h)	—
% of families that experience difficulties in obtaining care, by reason	Table 3.2 (00)	—
Getting appointments for care:		
% of people who report that they can get an appointment for routine care as soon as they want (always, usually, sometimes/never)	Table 3.3a (00; adult) Table 3.3b (00; child)	Table 3.3c Table 3.3d Table 3.3e Table 3.3f
% of people who report that they can get care for illness/injury as soon as they want (always, usually, sometimes/never)	Table 3.4a (00; adult) Table 3.4b (00; child)	Table 3.4c Table 3.4d Table 3.4e Table 3.4f
Waiting time:		
ED visits: Average time from arrival to being seen by a physician (separately for emergent, urgent, semi-urgent, and non-urgent visits)	Table 3.5a (9900;emerg) Table 3.5b (9899;emerg) Table 3.5c (9798;emerg) Table 3.5d (9900;semi) Table 3.5e (9899;semi) Table 3.5f (9798;semi)	—
ED visits: % of patients who left without being seen	Table 3.6a (9900) Table 3.6b (9899) Table 3.6c (9798)	—

Note: See Tables Appendix for tables listed above.

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Chapter 6. Patient Centeredness

Key Findings:

- Approximately 59% of adults responded that their health care provider always explained things clearly to them, while 9% reported that they were only sometimes or never provided clear explanations.
- About 69% of parents surveyed felt their child's health care provider always explained things clearly to them, while 6% reported that they only sometimes or never did.
- About 46% of adults indicated that their provider always spent enough time with them, while 16% reported that they only sometimes or never did.
- Approximately 57% of the parents surveyed felt that their child's health care provider always spent enough time with them, while 10% said that they only sometimes or never did.

Background and Impact

The mission of health care professionals and the health care system is to help patients maintain health, get well, and feel better. One way to achieve this mission is by a commitment and specific processes to ensure patients are at the center of the system and patients are a vital part of their own care.

"Patient centeredness" is defined as: "[H]ealth care that establishes a partnership among practitioners, patients, and their families (when appropriate) to ensure that decisions respect patients' wants, needs, and preferences and that patients have the education and support they need to make decisions and participate in their own care."[1] Patient centeredness "encompasses qualities of compassion, empathy, and responsiveness to the need, values, and expressed preferences of the individual patient."[2]

Communication is key to achieving patient-centered care. Research shows that the manner in which patients and clinicians communicate with each other can have an impact on patient satisfaction and quality of care.[3] Good patient-provider communication can help patients be heard, get the information they need, and fully participate in decisionmaking concerning their own care. Various studies have shown that effective patient-provider communication may:

- Lead to greater patient satisfaction.[4]
- Increase the likelihood that patients have access to essential medical and preventive health information.[5]

- Improve the chances that medical conditions are properly diagnosed (by ensuring that the doctor has more complete information).[5]

- Increase the patient's participation in decisionmaking about his or her medical conditions.

- Improve the chances that patients carry out health-related behavior modifications (e.g., exercising, quitting smoking, eating healthier, and complying with other treatments).[6]

- Reduce the number of complaints and lawsuits filed against providers. For example, plaintiffs in malpractice claims include dysfunctional delivery of information in 25% of filed cases and poor listening by the provider in 8%-13% of filed cases.[7]

Improving patient-centered care can involve a range of different aspects and activities. Providers can improve their communication skills through the use of patient-centered questioning techniques such as sequenced questioning,[8] humor, positive reinforcement, expressions of empathy, reassurance and support, and summarization and clarification.[6,9] Educating patients so that they more effectively communicate their concerns to their doctors is a complementary approach. One study showed that patients directly voice their concerns only about one-fourth of the time.[10]

How the NHQR Measures Patient Centeredness of Care

This report uses four indicators from personal response data collected by the Medical Expenditure Panel Survey. In the survey, adult patients and parents of patients under the age of 18 years were asked the following questions:

- Did the health care provider listen carefully?—It is important for providers to listen to patients, since they must rely on them for information about symptoms and other information bearing on medical conditions and treatments. It is also important for the provider to listen because patients and physicians often have different views of symptoms and treatment effectiveness.[11]

- Did the health care provider explain things clearly?—Providers often use medical terminology that patients do not understand, and patients may be too intimidated by the provider or simply lack the necessary understanding and skill to ask for clarification.[5] This may lead to patient noncompliance with the recommended treatment.[5]

- Did the health care provider show respect for what you had to say?— Respect for the patient's values, preferences, and expressed needs is one of several important dimensions of patient-centered care.[12]

- Did the health care provider spend enough time with you?—A frequently raised concern is that patients are not allowed enough time with their doctors during visits. There is evidence that patients' concerns about time may be based on factors other than actual objectively measured consultation time (i.e., concerns may be more about quality time rather than actual time).[13]

How the Nation Is Doing[i]

The results from MEPS provide a baseline for tracking future progress in providing more patient-centered care. The results from the 2000 survey are provided below, both for adults and the parents of children under the age of 18 years. The responses show some variation among population groups. Overall, parents of children seeking care consistently showed higher levels of satisfaction than adults seeking care. For the following four measures, near poor/low-income respondents were less likely to answer "always."

Did the health care provider listen carefully?

Adults. Fifty-seven percent of people surveyed responded that their health care provider always listened carefully to them, 33% said usually, and 10% said they were only sometimes or never listened to carefully.

Children. Sixty-six percent of parents surveyed responded that their child's health care provider always listened carefully to them, 28% said usually, and 6% said they were only sometimes or never listened to carefully.

Did the health care provider explain things clearly to you?

Adults. Overall, 59% of those surveyed responded that their health care provider always explained things clearly to them, 32% said usually, and 9% reported that they were only sometimes or never provided clear explanations.

Children. About 69% of parents surveyed felt their child's health care provider always explained things clearly to them, 25% said usually, and 6% reported that they only sometimes or never did.

Did the health care provider show respect for what you had to say?

Adults. Some 59% of respondents reported that their health care provider always showed respect for what they had to say, 31% said usually, and 10% said that their health care providers only sometimes or never did. Those who reported their health as fair or poor were more likely to report that they were not shown respect.

Children. About 68% of the parents surveyed responded that their child's health care provider always showed respect for what they had to say, 26% said usually, and 6% said that their health care providers only sometimes or never showed them respect.

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[i] Adjusting for known contributing factors, such as gender, age, and insurance status (multivariate analysis), would allow for more detailed exploration of the data, but this generally was not feasible for this report. Any adjustments that were done are noted in the detailed tables. The data presented in this report do not imply causation.

Did the health care provider spend enough time with you?

Adults. Compared with results for the other three questions, respondents were less satisfied with the amount of time they spent with their health care provider. Only about 46% of adults reported that their provider always spent enough time with them, 38% said usually, and 16% reported that they only sometimes or never did.

Children. Some 57% of the parents surveyed felt that their child's health care provider always spent enough time with them, 33% said usually, and 10% said that they only sometimes or never did.

What We Don't Know

The implications of patient preferences for the provider and for the provision of quality care are sometimes more complicated than they may at first appear, especially with the knowledge differential that exists between patient and physician. It has been demonstrated that a patient-centered approach can lead to improvements in quality of care. There currently are some limitations to what is known and can safely be said about this approach. One observation is that to be effective, patient-centered care has to take into account the individual variation that exists among patients. A few examples of this variability and complexity are provided below.

- Many patients do not want to be informed about their care.[14]
- Even when patients want to be informed about their medical condition and options for treatment, they may not wish to be actively involved in the decisionmaking process.[14]
- Studies have shown conflicting results on relationships between information-seeking behaviors and patient satisfaction.[15]

These factors suggest that it is important for providers to recognize and accommodate the variability in the preferences of individuals.[16] These factors also suggest the need for more research into the attributes and characteristics of patient-centered care.

What Can Be Done

Only recently have patient centeredness and patient assessments of their care experience been recognized as important dimensions of quality of care. Research is being conducted into a variety of areas related to patient centeredness, including development of assessment instruments, public reporting of patient assessment data, and various techniques to improve communication between health professionals and patients. AHRQ has been developing a series of CAHPS® surveys and similar surveys for hospital care, nursing home care, and care in other settings and working to promote the application of these instruments in improving health care for all Americans.[17]

CMS has joined with AHRQ to develop and implement a version of CAHPS® for Medicare enrollees who are making choices among managed care plans. Many State programs, such as those for State employees in Kansas and Washington and Medicaid enrollees in New Jersey, have been using CAHPS® to assess their patient experience of care. Beginning in spring 1999, all health plans have been required to report patient assessments of care data on quality to NCQA for accreditation purposes. A national repository for data from the CAHPS® family of surveys, the National CAHPS® Benchmarking Database (NCBD), was initiated in 1998 to support benchmarking and research related to consumer assessments of care. All sponsors of CAHPS® surveys that are administered according to CAHPS® specifications are invited to participate in the NCBD.[ii] Participating sponsors receive a customized report that compares their own results to appropriate benchmarks derived from the NCBD. Survey sponsors include public and private purchasers (employers, State Medicaid agencies, and Medicare) and individual health plans. It is expected that such patient centeredness data will be widely available to compare quality across institutions and patient groups and track changes over time.

The effectiveness of reporting data on patient centeredness is still being researched. For example, research suggests that patient-centered communication can be efficiently incorporated into medical encounters if clinicians learn the appropriate skills.[18]

More research is needed to understand patients' reporting of their experiences and how improved understanding and information help clinicians to better communicate with patients.

[ii] More information on the NCBD is available on the AHRQ Web site (www.ahrq.gov)

List of Measures

Patient Centeredness

Measure Title	*National*	*State*
Patient experience of care:		
% of patients who report that doctor listens carefully (always, usually, sometimes/never), adults and parents of children	Table 4.1a (adult) Table 4.1b (child)	Table 4.1c (a mcaid (27)) Table 4.1d (c mcaid (32)) Table 4.2e (mc FFS (30)) Table 4.2f (mc manc (32))
% of patients who report that doctor explains things clearly (always, usually, sometimes/never), adults and parents of children	Table 4.2a (adult) Table 4.2b (child)	Table 4.2c (a mcaid (29)) Table 4.2d (c mcaid (34,38) Table 4.2e (mc FFS (31)) Table 4.2f (mc manc (33))
% of patients who report that doctor showed respect for what they had to say (always, usually, sometimes/never), adults and parents	Table 4.3a (adult) Table 4.3b (child)	Table 4.3c (a mcaid (30)) Table 4.3d (c mcaid (35)) Table 4.3e (mc FFS (32)) Table 4.3f (mc manc (34))
% of patients who report that doctor spent enough time with them (always, usually, sometimes/never), adults and parents of children	Table 4.4b (child) Table 4.4a (adult)	Table 4.4c (a mcaid (31)) Table 4.4d (c mcaid (39)) Table 4.4e (mc FFS (33)) Table 4.4f (mc manc (35))

Note: See Tables Appendix for tables listed above.

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Chapter 7. Conclusion

> "A journey of a thousand miles must begin with a single step."
>
> *Lao-tzu (604 BC - 531 BC)*

This first National Healthcare Quality Report is not the first step on the journey to an improved U.S. health care system. Many other authors and organizations have already begun the effort to assess the quality of care nationally and improve it. However, this report is one important step on the road to national improvement in American health care delivery. The danger that must be averted is that we become so involved in the "journey," the reporting on quality of care, that we do not do enough to ensure that this report and others like it are being used to accomplish our ultimate objective: to improve health care quality in America. In this chapter, we offer a summary of our key findings in reporting on health care quality in America, as well as a look forward to what comes next.

Key Findings:

- High quality health care is not yet a universal reality.
- Opportunities for preventive care are frequently missed.
- Management of chronic diseases presents unique quality challenges.
- There is more to learn.
- Greater improvement is possible.

High quality health care is not yet a universal reality in America. This report identifies many areas where there is a gap between what we know should be done and what patients and their providers continue to do. However, this report also identifies numerous areas where health care is improving to the point where we are close to reaching and surpassing national performance goals.

The report presents the most comprehensive national picture to date that confirms this observation. Levels of quality of care, across the variety of measures tracked in the report, vary for different aspects of health care and across regions, States, and patient groups. Quality also varies by demographic categories including age, sex, race, and ethnicity. Rates remain low for provision of some basic and cost-effective preventive care and disparities persist in quality of care for certain subgroups.

Despite this variation, quality of care has markedly improved and is now uniformly high in several notable areas. Moreover, best practices show us how to provide cost-effective, high quality care. In many of the efforts cited in this report as examples of best practices, the central role of data in quality improvement efforts is underscored. In many of the priority conditions and dimensions of quality presented in this report, we do not have a complete picture of our national performance. Ongoing work by private-sector provider, payer, and research organizations, as well as by public-sector entities, needs to focus on filling in the gaps in our ability to measure quality in other areas.

With time, we will be able to answer such questions, but we expect that, by drawing on existing measures and broad expert and public input, the report will promote consistency across multiple initiatives and will provide a template for selecting future national quality measures. Moreover, it is clear that this report is already making an impact at the State and national levels. Outreach conducted by AHRQ to State partners and to private-sector organizations has resulted in policy activities at the State and local levels to align State health care quality reports with the report framework and measure set. Such efforts can help to reduce the burden of quality measurement for providers and health care organizations and enable broader comparisons across our health care system. We expect these activities to continue as consensus activities continue for this report and for future reports. This report is expected to become a unifying tool for measurement and improvement activities in health care quality nationally as it is updated and improved in future quality reports. Finally, for the American health care system, the report will be a baseline to judge the future performance of the entire health care system.

The impact of the report will depend on how the information contained in this report is used. Currently, the picture of health care quality in America is fragmented and incomplete. With this first quality report, we are beginning the process of completing that picture.

What can be done now that this broad picture of health care quality in America has been painted? This report is built on the premise that, in order to begin a journey, you must know where you are going and have information on your progress. This report, we believe, provides us with information that will help us track our progress toward more effective, safe, timely, and patient-centered care. Future editions of this report will attempt to align more closely with Departmental priority areas.

This report provides information on a number of areas where improvement is being realized in the American health care system. These improvements are coming across the spectrum of care. For example:

- **Staying healthy.** Screening rates for cervical and colorectal cancer have been increasing over the past decade, and cholesterol screening rates have greatly increased over the past two decades. Childhood immunizations continue to be high, and the Nation is doing better at ensuring that minorities are immunized at rates comparable to the rest of the population.

- **Getting better.** The percentage of patients who received beta-blockers when they were discharged from the hospital following a heart attack increased significantly between 1998 to 1999 and 2000 to 2001.

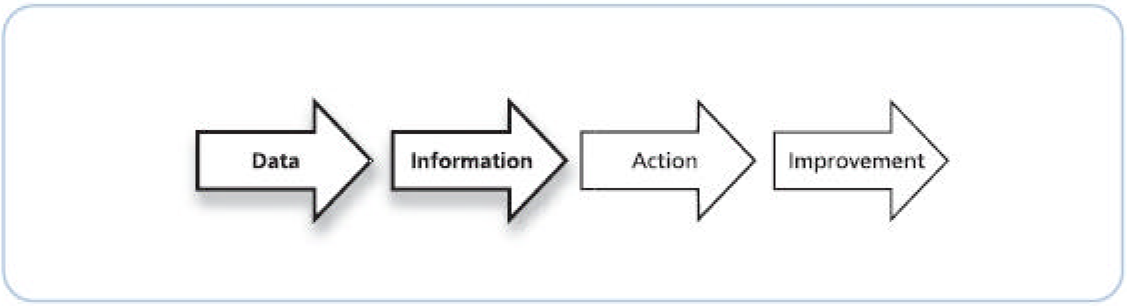
- **Living with illness.** We are doing a better job of helping diabetes patients manage their illness and stay out of the hospital. Hospital admissions for uncontrolled diabetes have decreased from 40.7 to 28.2 per 100,000 population in just 5 years from 1996 to 2000.

- **End-of-life care.** While better measures are needed in this area, the percentage of cancer patients who received hospice care increased significantly between 1996 and 1998 from 39% to 55%.

These are a few examples of improvement at a national level, but improvement at local and State levels is more common.

The report also highlights many areas where we are not making progress or where important groups are being left behind. Throughout the report, we have tried to highlight success stories and best practices that can help shed light on how to improve performance where it is lagging. It is hoped that the report will help to align the multiple efforts at quality measurement and thereby better focus national discussion on quality from measurement issues to improvement issues. While there are many models of how to improve quality within health care, a simple way of thinking of the role of this report in the process of improving care is shown in Figure 1.

Figure 1. What's next: The role of the NHQR



This report represents a large amount of work by a host of Federal and private partners to develop consensus on the important dimensions of quality, health conditions, aspects of care, and specific measures that will best give a picture of quality of care in America. The report represents the first step toward improvement as portrayed in Figure 1: that is, gathering and synthesizing data to turn it into information. What must happen next is the use of that information for action and improvement.

There may be numerous initiatives that result from the information in this report and future refinements to this report. Health care delivery changes every day as new technologies and methods are introduced. In such an evolving system, there is no single answer to improving quality. The mandate for this report is not to lay out a blueprint for how we should improve health care in America. Instead, there are several key steps in moving from data to improvement in health care. First, data must be understood and synthesized into information that is usable by decisionmakers, whether they are at the patient care level or the policy level. Second, information must be translated into action. One example of a program supported by AHRQ that is helping to translate data into action is the Translating Research Into Practice program, or TRIP.

TRIP is a collaborative effort between AHRQ and the Health Services Research and Development Service (HSR&D) within the Department of Veterans Affairs. Through the TRIP agenda, AHRQ sponsors applied research to develop sustainable and replicable models and tools to improve the quality, outcomes, effectiveness, efficiency, and cost-effectiveness of health care. For example:

- **Designing an asthma intervention for resource constrained environments.** Researchers, led by Judith Fifield at the University of Connecticut, planned to translate NAEPP (National Asthma Education and Prevention Program) guidelines using feedback and cues close to the time of decisionmaking and without increasing the length or the cost of the visit. Preliminary work with their target sites revealed that the sites did not have electronic medical record systems or plans to purchase such systems. Consequently, the project resulted in development of a model of technology that was affordable and flexible for implementation in the Medicaid managed care environment. The system supports TRIP as well as TRIP research. Instead of being redundant or time consuming, it is organized around "smart cues"—decision support reports that combine specifics about individual patients with best practices from NAEPP guidelines. The system includes computerized system support for screening, contacting, and tracking pediatric asthma patients, while simultaneously delivering smart cues to prompt practitioners to deliver guideline care. The technical design of the system is a client-server system that offers the advantages and integrity of a centralized Web-based database housed in a single locale, while supporting the requirements of multisite data generation, data entry, and reporting.[1]

- **Overcoming resistance to pain management guidelines in nursing homes.** Researchers, led by Katherine Jones of the University of Colorado, found that resistance to pain management guidelines occurred at multiple levels in nursing homes. Residents, staff, and physicians have attitude and knowledge gaps that pose barriers to guideline acceptance. Resident barriers include: dislike of multiple medications, fear of side effects and addiction to opioids, belief that pain is inevitable, feeling medication would be unavailable even if requested, belief the medication is ineffective, and concerns about bothering the nurses. Staff lacked information regarding pharmacologic management and the effectiveness of non-pharmacologic interventions, and they missed cues by stereotyping patients when assessing and treating pain. Physicians resisted the guidelines and did not want to change prescribing practices based on nursing home staff assessments. Through careful analysis of barriers to changes in practice, the intervention was able to address this resistance successfully and initiate improvements in guideline compliance.[1]

This report is the first of its kind. As such, it is the first in a long journey toward improved health care quality. Future reports will be able to improve on the picture of quality offered in this report as consensus develops around new, better measures and new, more detailed quality data. The Department of Health and Human Services and the Agency for Healthcare Research and Quality look forward to feedback on this report and to improving future reports so that the NHQR can truly serve as a benchmark for quality for America’s health care system.

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List of Acronyms

ACE	angiotensin converting enzyme
ADLs	activities of daily living
AHCPR	Agency for Health Care Policy and Research (now AHRQ)
AHRQ	Agency for Healthcare Research and Quality
AIDS	acquired immune deficiency syndrome
AMI	acute myocardial infarction
ART	antiretroviral therapy
ASPE	Assistant Secretary for Planning and Evaluation
BRFSS	Behavioral Risk Factor Surveillance System
CAHMI	Child and Adolescent Health Measurement Initiative
CAHPS	Consumer Assessment of Health Plans
CDC	Centers for Disease Control and Prevention
CDC TB	Centers for Disease Control and Prevention National Tuberculosis Surveillance System
CHF	congestive heart failure
CKD	chronic kidney disease
CMS	Centers for Medicare & Medicaid Services
COPD	chronic obstructive pulmonary disease
CPM	Clinical Performance Measures
CSFII	Continuing Survey of Food Intake by Individuals (1994-96)
CSHCN	children with special health care needs
CVD	cardiovascular disease
DFC	Dialysis Facility Compare
DHHS	Department of Health and Human Services
DON	Diabetes Outreach Network
DQIP	Diabetes Quality Improvement Project
ESRD	end stage renal disease
FAP	Facility Admission Profile
FOBT	Fecal occult blood tests
GDP	national gross domestic product
GFR	glomerular filtration rate
HAART	highly active anti-retroviral therapy
HCFA	Heath Care Financing Administration (now CMS)
HCSUS	HIV Cost and Services Utilization Study
HCUP	Healthcare Cost and Utilization Project
HEDIS	Health Plan Employer Data and Information Set
HHAs	home health agencies
HIV	human immunodeficiency virus
HP2010	Healthy People 2010

HSR&D	Health Services Research and Development Service
IADLs	instrumental activities of daily living
ICU	intensive care units
IMSystem	Indicator Measurement System
IOM	Institute of Medicine
IT	information technology
JCAHO	Joint Commission for Accreditation of Healthcare Organizations
K/DOQI	Kidney Disease Outcomes Quality Initiative
LHI	Leading Health Indicator
LTBI	latent tuberculosis infection
MDS	Minimum Data Set
MEPS	Medical Expenditure Panel Survey
MQMS	Medicare Quality Monitoring System
MTF	Monitoring the Future Study
NAEPP	National Asthma Education and Prevention Program
NAMCS	National Ambulatory Medical Care Survey
NHA	National Health Accounts
NCBD	National CAHPS Benchmarking Database
NCI	National Cancer Institute
NCQA	National Committee for Quality Assurance
NCVS	National Crime Victimization Survey
NDEP	National Diabetes Education Program
NETSS	National Electronic Telecommunications System for Surveillance
NHAMCS	National Hospital Ambulatory Medical Care Survey
NHANES	National Health and Nutrition Examination Survey
NHDS	National Hospital Discharge Survey
NHHCS	National Home Health and Hospice Care Survey
NHIS	National Health Interview Survey
NHQR	National Healthcare Quality Report
NHSDA	National Household Survey on Drug Abuse
NIDDK	National Institute of Diabetes and Digestive and Kidney Diseases
NIS	National Immunization Survey
NKF	National Kidney Foundation
NNDSS	National Notifiable Disease Surveillance System
NNHS	National Nursing Home Survey
NNIS	National Nosocomial Infections Surveillance
NPLHD	National Profile of Local Health Departments
NQF	National Quality Forum
NSFG	National Survey of Family Growth
NTBSS	National TB Surveillance System
NVSS-I	National Vital Statistics System - Linked Birth and Infant Death Data

NVSS-M	National Vital Statistics System, Mortality
NVSS-N	National Vital Statistics System, Natality
NWHPS	National Worksite Health Promotion Survey
OASIS	Outcome and Assessment Information Set
OBQI	Outcome-Based Quality Improvement
OBRA	Omnibus Budget Reconciliation Act
OECD	Organization for Economic Cooperation & Development Health Data File
OpDiv	Operating Division
PPS	prospective payment system
PSA	prostate specific antigen test
PSI	Patient Safety Indicator
PTCA	percutaneous transluminal coronary angioplasty
QIO	Quality Improvement Organization
SAMHSA	Substance Abuse and Mental Health Services Administration
SEER	Surveillance, Epidemiology, and End Results Program
SHPPS	School Health Policies and Programs Study
STATE	State Tobacco Activities Tracking and Evaluation System
STDSS	Sexually Transmitted Disease Surveillance System
TB	tuberculosis
TEP	technical expert panel
TRIP	Translating Research Into Practice
TST	tuberculin skin test
UNAIDS	United Nations Programme on HIV/AIDS
URR	urea reduction ratio
USC	usual source of care
USRDS	United States Renal Data System
UTI	urinary tract infection
VA	Department of Veterans Affairs
VAP	ventilator-associated pneumonia
Vital statistics	National Vital Statistics System
WHO	World Health Organization
YRBSS	Youth Risk Behavior Surveillance System

List of Measures

Measure	Measure Specifications a/	National Database a/	State Database a/
EFFECTIVENESS OF CARE			
CANCER			
Screening for breast cancer:			
Process: % of women (age 40 and over) who report they had a mammogram within the past 2 years	HP2010(3-13)	NHIS	BRFSS
Outcome: Rate of breast cancers diagnosed at advanced stage	SEER program	SEER	n.a.
Screening for cervical cancer:			
Process: % of women (age 18 and over) who report that they had a Pap smear within the past 3 years	HP2010(3-11b)	NHIS	BRFSS
Outcome: Rate of cervical cancers diagnosed as invasive (includes local, regional, and distant disease except in situ disease)	SEER program	SEER	n.a.
Screening for colorectal cancer:			
Process: % of men and women (age 50 and over) who report they ever had a flexible sigmoidoscopy/colonoscopy	HP2010(3-12b)	NHIS	BRFSS
Process: % of men and women (age 50 and over) who report they had a fecal occult blood test (FOBT) within the past 2 years	HP2010(3-12a)	NHIS	BRFSS
Outcome: Rate of colorectal cancers diagnosed as regional or distant staged cancers	SEER program	SEER	n.a.

Measure	Measure Specifications a/	National Database a/	State Database a/
EFFECTIVENESS OF CARE			
CANCER (cont.)			
Cancer treatment:			
Outcome: Cancer deaths per 100,000 persons per year for all cancers	HP2010(3-1)	Vital statistics	Vital statistics
Outcome: Cancer deaths per 100,000 persons per year for most common cancers, prostate cancer	HP2010(3-7)	Vital statistics	Vital statistics
Outcome: Cancer deaths per 100,000 persons per year for most common cancers, breast cancer	HP2010(3-3)	Vital statistics	Vital statistics
Outcome: Cancer deaths per 100,000 persons per year for most common cancers, lung cancer	HP2010(3-2)	Vital statistics	Vital statistics
Outcome: Cancer deaths per 100,000 persons per year for most common cancers, colorectal cancer	HP2010(3-5)	Vital statistics	Vital statistics
Palliative care:			
Process: Cancer deaths in hospice per 100 cancer deaths		NHHCS-Vital statistics	n.a
Process: Median length of stay for cancer patients who received hospice care		NHHCS	n.a.

Measure	Measure Specifications a/	National Database a/	State Database a/
EFFECTIVENESS OF CARE			
END STAGE RENAL DISEASE			
Management of End Stage Renal Disease:			
Process: % of dialysis patients registered on waiting list for transplantation	HP2010 4-5	USRDS	USRDS
Process: % of patients with treated chronic kidney failure who receive a transplant within three years of registration on waiting list	HP2010 4-6	USRDS	USRDS
Outcome: % of hemodialysis patients with URR 65 or greater	From CMS, Umich Unit Specific Report, pp.3,4,5, 18,21	U. Michigan	U. Michigan
Outcome:% of patients with hematocrit 33 or greater	From CMS, Umich Unit Specific Report, pp.3,4,5, 18,21	U. Michigan	U. Michigan
Outcome: Patient survival rate	From CMS, Umich Unit Specific Report, pp.3,4,5, 18,21	U. Michigan	U. Michigan
DIABETES			
Management of diabetes:			
Process: % of adults with diabetes who had a hemoglobin A1c measurement at least once in past year	Specs for MEPS	MEPS	BRFSS
Process: % of patients with diabetes who had a lipid profile in past two years	Specs for MEPS	MEPS	n.a.
Process: % of adults with diabetes who had a retinal eye examination in past year	Specs for MEPS	MEPS	BRFSS
Process: % of adults with diabetes who had a foot examination in past year	Specs for MEPS	MEPS	BRFSS

Measure	Measure Specifications a/	National Database a/	State Database a/
EFFECTIVENESS OF CARE			
DIABETES			
Management of diabetes (cont.):			
Process: % of adults with diabetes who had an influenza immunization in past year	Specs for MEPS	MEPS	BRFSS
Outcome: % of adults with diagnosed diabetes with HbA1c level > 9.5% (poor control); < 9.0 (minimally acceptable); < 7.0 (optimal)	National Diabetes Quality Improvement Alliance	NHANES	n.a.
Outcome: % of adults with diagnosed diabetes with most recent LDL-C level <130 mg/dL (minimally acceptable); <100 (optimal) b/	National Diabetes Quality Improvement Alliance	n.a.	n.a.
Outcome: % of adults with diagnosed diabetes with most recent blood pressure <140/90 mm/Hg	National Diabetes Quality Improvement Alliance	NHANES	n.a.
Outcome: Hospital admissions for uncontrolled diabetes per 100,000 population	AHRQ-QI	HCUP	n.a.
Outcome: Hospital admissions for short-term complications of diabetes per 100,000 population	AHRQ-QI	HCUP	n.a.
Outcome: Hospital admissions for long-term complications of diabetes per 100,000 population	AHRQ-QI	HCUP	n.a.
Outcome: Hospital admissions for lower extremity amputations in patients with diabetes per 1,000 population	HP 2010(5-10)	NHDS	n.a.

Measure	Measure Specifications a/	National Database a/	State Database a/
EFFECTIVENESS OF CARE			
HEART DISEASE			
Screening for high blood pressure:			
Process: % of people age 18 and over who have had blood pressure measured within preceding 2 years and can state whether their blood pressure is normal or high	HP2010	NHIS	BRFSS
Screening for high cholesterol:			
Process: % of adults 18 and over receiving cholesterol measurement within 5 years	HP2010(12-15)	NHIS	BRFSS
Counseling on risk factors:			
Process: % of smokers receiving advice to quit smoking	HP2010(1-3c)	MEPS	BRFSS
Treatment of AMI:			
Process: % of AMI patients administered aspirin within 24 hours of admission	QIO scope of work	QIO	QIO
Process: % of AMI patients with aspirin prescribed at discharge	QIO scope of work	QIO	QIO
Process: % of AMI patients administered beta blocker within 24 hours of admission	QIO scope of work	QIO	QIO
Process: % of AMI patients with beta blocker prescribed at discharge	QIO scope of work	QIO	QIO
Process: % of AMI patients with left ventricular systolic dysfunction prescribed ACE inhibitor at discharge	QIO scope of work	QIO	QIO
Process: % of AMI patients given smoking cessation counseling while hospitalized	QIO scope of work	QIO	QIO

Measure	Measure Specifications a/	National Database a/	State Database a/
EFFECTIVENESS OF CARE			
HEART DISEASE			
Treatment of AMI (cont.):			
Process: Median Time to Thrombolysis. Time from arrival to initiation of a thrombolytic agent in patients with ST segment elevation or left bundle branch block (LBBB) on the electrocardiogram (ECG) performed closest to hospital arrival time	QIO scope of work	QIO	QIO
Process: Median time to PTCA. Median time from arrival to percutaneous transluminal angioplasty (PTCA) in patients with ST segment elevation or left bundle branch block (LBBB) on the electrocardiogram (ECG) performed closest to hospital arrival time.	QIO scope of work	QIO	QIO
Treatment of acute heart failure:			
Process: % of heart failure patients having evaluation of left ventricular ejection fraction	QIO scope of work	QIO	QIO
Process: % of heart failure patients with left ventricular systolic dysfunction prescribed ACE inhibitor at discharge	QIO scope of work	QIO	QIO
Management of hypertension:			
Outcome: % of people with hypertension who have blood pressure under control	HP2010(12-10)	NHANES	n.a.
Management of CHF:			
Outcome: Hospital admissions for congestive heart failure (CHF) per 1,000 population	HP2010(12-6)	NHDS	n.a.

Measure	Measure Specifications a/	National Database a/	State Database a/
EFFECTIVENESS OF CARE			
HIV/AIDS			
AIDS prevention:			
Outcome: New AIDS cases per 100,000 population (age 13 and over)	HP2010(13-1)	CDC-AIDS	n.a.
Management of HIV/AIDS:			
Outcome: HIV-infection deaths per 100,000 population	HP2010(13-14)	Vital statistics	Vital statistics
MATERNAL AND CHILD HEALTH			
Maternity care:			
Process: % of pregnant women receiving prenatal care in first trimester	HP2010(16-6a)	Vital statistics	Vital statistics
Outcome: % of liveborn infants with low and very low birthweight (less than 2,500 grams, less than 1,500 grams)	HP2010(16-10)	Vital statistics	Vital statistics
Outcome: Infant mortality per 1,000 live births	HP2010(16-1c)	Vital statistics	Vital statistics
Outcome: Maternal deaths per 100,000 live births	HP2010(16-4)	Vital statistics	Vital statistics
[See Safety measures for complications of obstetric care]			
Immunization, childhood:			
Process: % of children 19-35 months who received all recommended vaccines	HP2010(14-24a)	NIS	NIS
Process: % of children 19-35 months who received 4 doses of DPaT vaccine	HP2010(14-22a)	NIS	NIS
Process: % of children 19-35 months who received 3 doses of polio vaccine	HP2010(14-22e)	NIS	NIS
Process: % of children 19-35 months who received 1 dose of MMR vaccine	HP2010(14-22d)	NIS	NIS

Measure	Measure Specifications a/	National Database a/	State Database a/
EFFECTIVENESS OF CARE			
MATERNAL AND CHILD HEALTH			
Immunization, childhood, (cont.):			
Process: % of children 19-35 months who received 3 doses of Hib vaccine	HP2010(14-22b)	NIS	NIS
Process: % of children 19-35 months who received 3 doses of hepatitis B vaccine	HP2010(14-22c)	NIS	NIS
Process: % of children 19-35 months who received 1 dose of varicella vaccine	HP2010(14-22f)	NIS	NIS
Immunization, adolescent:			
Process: % of adolescents (age 13-15) reported to have received 3 or more doses of hepatitis B vaccine	HP2010(14-27a)	NHIS	n.a.
Process: % of adolescents (age 13-15) reported to have received 2 or more doses of MMR vaccine	HP2010(14-27b)	NHIS	n.a.
Process: % of adolescents (age 13-15) reported to have received 1 or more doses of tetanus-diphtheria booster	HP2010(14-27c)	NHIS	n.a.
Process: % of adolescents (age 13-15) reported to have received 3 or more doses of varicella vaccine	HP2010(14-27d)	NHIS	n.a.
Childhood dental care:			
Process: % of children age 2-17 who report dental visit in last year	HP 2010(21-10)	MEPS	n.a.
Treatment of pediatric gastroenteritis:			
Outcome: Hospital admissions for pediatric gastroenteritis per 100,000 population less than 18 years of age	AHRQ-QI	HCUP	n.a.

Measure	Measure Specifications a/	National Database a/	State Database a/
EFFECTIVENESS OF CARE			
MENTAL HEALTH			
Treatment of depression:			
Process: % of adults diagnosed with a new episode of depression who had optimal practitioner contacts for medication management during the acute treatment phase	HEDIS	HEDIS	n.a.
Process: % of adults diagnosed with a new episode of depression and initiated on an antidepressant drug who received a continuous trial of medication treatment during the acute treatment phase	HEDIS	HEDIS	n.a.
Process: % of adults diagnosed with a new episode of depression and initiated on an antidepressant drug who remained on an antidepressant medication through the continuation phase of treatment	HEDIS	HEDIS	n.a.
Outcome: Deaths due to suicide per 100,000 population	HP2010(18-1)	Vital statistics	Vital statistics
RESPIRATORY DISEASES			
Immunization, influenza:			
Process: % of high risk persons (e.g., COPD) age 18-64 who received an influenza vaccination in the past 12 months	HP2010(14-29c)	NHIS	BRFSS
Process: % of persons age 65 and over who received an influenza vaccination in the past 12 months	HP2010(14-29a)	NHIS	BRFSS
Process: % of institutionalized adults (persons in long-term care or nursing homes) who received influenza vaccination in past 12 months	HP2010(14-29e)	NNHS	n.a.

Measure	Measure Specifications a/	National Database a/	State Database a/
EFFECTIVENESS OF CARE			
RESPIRATORY DISEASES			
Immunization, influenza (cont.):			
Outcome: Hospital admissions for immunization-preventable influenza per 100,000 population	HP2010 (1-9c, approximate) AHRQ-QI	HCUP	n.a.
Immunization, pneumonia:			
Process: % of high risk persons (e.g., COPD) age 18-64 who ever received a pneumococcol vaccination	HP2010(14-29d)	NHIS	BRFSS
Process: % of persons age 65 and over who ever received a pneumococcol vaccination	HP2010(14-29b)	NHIS	BRFSS
Process: % of institutionalized adults (persons in long-term care or nursing homes) who ever received pneumococcol vaccination	HP2010(14-29f)	NNHS	n.a.
Treatment of pneumonia:			
Process: % of patients with pneumonia who have blood cultures collected before antibiotics are administered	QIO scope of work	QIO	QIO
Process: % of patients with pneumonia who receive the initial antibiotic dose within 8 hours of hospital arrival	QIO scope of work	QIO	QIO
Process: % of patients with pneumonia who receive the initial antibiotic consistent with current recommendations	QIO scope of work	QIO	QIO
Process: % of patients with pneumonia who receive influenza screening or vaccination	QIO scope of work	QIO	QIO

Measure	Measure Specifications a/	National Database a/	State Database a/
EFFECTIVENESS OF CARE			
RESPIRATORY DISEASES			
Treatment of pneumonia (cont.):			
Process: % of patients with pneumonia who receive pneumococcal screening or vaccination	QIO scope of work	QIO	QIO
Treatment of URI:			
Process: % of visits where antibiotic was prescribed for the diagnosis of a common cold, children & adults	HP2010(14-19)	NAMCS-NHAMCS	n.a.
Management of asthma:			
Process: % of people with persistent asthma who are prescribed medications acceptable as primary therapy for long-term control of asthma (inhaled corticosteroids)	HEDIS	HEDIS	n.a.
Outcome: Hospital admissions for pediatric asthma per 10,000 population under age 18	HP2010 (24-2, 1-9a)	NHDS	n.a.
Outcome: Hospital admissions for asthma per 10,000 population	HP2010(24-2)	NHDS	n.a.
Outcome: Hospital admissions for asthma per 100,000 population age 65 and over	AHRQ-QI	HCUP	n.a.
Treatment of TB:			
Process: % of TB patients that complete a curative course of TB treatment within 12 months of initiation of treatment		CDC, TB	n.a.

Measure	Measure Specifications a/	National Database a/	State Database a/
EFFECTIVENESS OF CARE			
NURSING HOME AND HOME HEALTH CARE			
Nursing facility care:			
Chronic care: % of residents with pain	CMS	n.a.	MDS
Chronic care: Late-loss ADL worsening	CMS	n.a.	MDS
Chronic care: Infections prevalence	CMS	n.a.	MDS
Chronic care: Stage 1-4 pressure ulcer prevalence	CMS	n.a.	MDS
Chronic care: Restraint use prevalence	CMS	n.a.	MDS
Post acute care: Failure to improve/ manage delirium symptoms	CMS	n.a.	MDS
Post acute care: % of residents with pain	CMS	n.a.	MDS
Post acute care: Improvement in walking	CMS	n.a.	MDS
Home health care:			
Outcome: Improvement in upper body dressing	CMS	n.a.	OASIS
Outcome: Improvement in management of oral medications	CMS	n.a.	OASIS
Outcome: Improvement in bathing	CMS	n.a.	OASIS
Outcome: Stabilization in bathing	CMS	n.a.	OASIS
Outcome: Improvement in transferring	CMS	n.a.	OASIS
Outcome: Improvement in ambulation/locomotion	CMS	n.a.	OASIS
Outcome: Improvement in toileting	CMS	n.a.	OASIS
Outcome: Improvement in pain interfering with activity	CMS	n.a.	OASIS

Measure	Measure Specifications a/	National Database a/	State Database a/
EFFECTIVENESS OF CARE			
NURSING HOME AND HOME HEALTH CARE			
Home health care (cont.):			
Outcome: Improvement in dyspnea	CMS	n.a.	OASIS
Outcome: Improvement in urinary incontinence	CMS	n.a.	OASIS
Outcome: Improvement in confusion frequency	CMS	n.a.	OASIS
Outcome: Acute care hospitalization	CMS	n.a.	OASIS
SAFETY			
Complications of care:			
Birth trauma	AHRQ-QI	HCUP	n.a.
Death in low mortality DRGs	AHRQ-QI	HCUP	n.a.
Failure to rescue	AHRQ-QI	HCUP	n.a.
Transfusion reaction and transfusion reaction (area)	AHRQ-QI	HCUP	n.a.
Foreign body left in body during procedure and foreign body left in body during procedure (area)	AHRQ-QI	HCUP	n.a.
Central line-associated bloodstream infection in ICU patients	HP2010(14-20b)	NNIS	n.a.
Central line-associated bloodstream infection in infants weighing 1000 grams or less at birth in intensive care	HP2010(14-20d)	NNIS	n.a.
Complications of anesthesia	AHRQ-QI	HCUP	n.a.
Decubitus ulcer	AHRQ-QI	HCUP	n.a.
Iatrogenic pneumothorax and iatrogenic pneumothorax (area)	AHRQ-QI	HCUP	n.a.

Measure	Measure Specifications a/	National Database a/	State Database a/
SAFETY			
Complications of care (cont.):			
Infection due to intravenous lines or catheters and infection due to intravenous lines or catheters (area)	AHRQ-QI	HCUP	n.a.
Postoperative hip fracture	AHRQ-QI	HCUP	n.a.
Postoperative hemorrhage or hematoma	AHRQ-QI	HCUP	n.a.
Postoperative physiologic and metabolic derangements	AHRQ-QI	HCUP	n.a.
Postoperative respiratory failure	AHRQ-QI	HCUP	n.a.
Postoperative pulmonary embolism or deep vein thrombosis	AHRQ-QI	HCUP	n.a.
Postoperative septicemia	AHRQ-QI	HCUP	n.a.
Technical difficulty with procedure and technical difficulty with procedure (area)	AHRQ-QI	HCUP	n.a.
Postoperative wound dehiscence and postoperative wound dehiscence (area)	AHRQ-QI	HCUP	n.a.
Obstetrical trauma - vaginal with instrument	AHRQ-QI	HCUP	n.a.
Obstetrical trauma - vaginal without instrument	AHRQ-QI	HCUP	n.a.
Obstetric trauma - cesarean delivery	AHRQ-QI	HCUP	n.a.
Prescribing medications:			
% of community dwelling elderly who had at least one prescription (from a list of 11 medications and from a list of 33 medications) that is potentially inappropriate for the elderly.	AHRQ-QI	MEPS	n.a.

Measure	Measure Specifications a/	National Database a/	State Database a/
SAFETY			
Prescribing medications (cont.):			
% of adults who report that usual source of care asks about prescription medications and treatments from other providers	Specs for MEPS	MEPS	n.a.
TIMELINESS			
Basic access:			
% of persons who report that they have a usual source of medical care, by place of care	HP2010(1-4)	NHIS	n.a.
% of families who experienced difficulty in obtaining care, by reason	HP2010(1-6)	MEPS	n.a.
Getting appointments for care:			
% of persons who report that they can get an appointment for routine care as soon as they wanted (always, usually, sometimes/never)	Specs for MEPS	MEPS	NCBD
% of persons who report that they can get care for illness/injury as soon as they wanted (always, usually, sometimes/never)	Specs for MEPS	MEPS	NCBD
Waiting time:			
ED visits: % of patients with waiting time to be seen by physician greater than or equal to one hour (presented separately for emergent, urgent, semi-urgent, and NAMCS-non-urgent visits)	NCHS	NAMCS-NHAMCS	n.a.
ED visits: % of patients who left NAMCS-without being seen	NCHS	NAMCS-NHAMCS	n.a.

Measure	Measure Specifications a/	National Database a/	State Database a/
PATIENT CENTEREDNESS			
Patient experience of care:			
% of patients who report that doctor listens carefully (always, usually, sometimes/never), adults and parents of children	Specs for MEPS	MEPS	NCBD
% of patients who report that doctor explains things clearly (always, usually, sometimes/never), adults and parents of children	Specs for MEPS	MEPS	NCBD
% of patients who report that doctor showed respect for what you had to say (always, usually, sometimes/never), adults and parents	Specs for MEPS	MEPS	NCBD
% of patients who report that doctor spent enough time with them (always, usually, sometimes/never), adults and parents of children	Specs for MEPS	MEPS	NCBD
RESOURCE CONSUMPTION			
National Health Expenditures by Source of Funds: Selected Calendar Years		NHA	n.a.
Total per capita health expenditures in dollars: Selected countries and years		NCHS	n.a.
Total Personal Health Care as a Percent of Gross State Product by State		n.a.	NHA
OVERALL MEASURES			
Overall rating of health care received	Specs for MEPS	MEPS	NCBD
Life expectancy (at birth, at age 65)		Vital statistics	n.a.
Days of activity limitation due to health		NHIS	n.a.

Notes

a/ AHRQ-QI=AHRQ Quality Indicators (Prevention Quality Indicators and Patient Safety Indicators)
BRFSS=Behavioral Risk Factor Surveillance System
CDC TB=Centers for Disease Control & Prevention National Tuberculosis Surveillance System
HCUP=Healthcare Cost and Utilization Project
HEDIS=Health Plan and Employer Data Information Set
HP2010=Healthy People 2010 JCAHO=Joint Commission for Accreditation of Healthcare Organization's hospital core measures.
LHI=Leading Health Indicators.
MEPS=Medical Expenditure Panel Survey
MDS=Minimum Data Set
NAMCS=National Ambulatory Medical Care Survey
NCBD=National CAHPS Benchmarking Database
NCQA=National Committee for Quality Assurance's HEDIS measure set
NHA=National Health Accounts
NHANES=National Health and Nutrition Examination Survey
NHIS=National Health Interview Survey
NHHCS=National Home Health and Hospice Care Survey
NHAMCS=National Hospital Ambulatory Medical Care Survey
NHDS=National Hospital Discharge Survey
NIS=National Immunization Survey
NNHS=National Nursing Home Survey
NQF=National Quality Forum
OECD=Organization for Economic Cooperation & Development Health Data File
Vital statistics=National Vital Statistics System, Mortality
SEER=Surveillance, Epidemiology, and End Results Program
USRDS=United States Renal Data System
WHO=World Health Organization

b/ Measure listed is part of approved final NHQR measure set.
However, data were unavailable for first NHQR.