National Healthcare Quality Report

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National Healthcare Quality Report

2007

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Contents

2007 National Healthcare Quality Report—At A Glance

The quality of health care in this Nation continues to improve at a modest pace. However, the rate of improvement appears to be slowing. The average annual rate of improvement reported across the core measures included in this year's fifth annual National Healthcare Quality Report (NHQR) is 2.3%, based on data spanning 1994 to 2005. An analysis of selected core measures, which cover data from 2000 to 2005, shows that quality has slowed to an annual rate of 1.5%.

An important goal of improving health care quality is to reduce variation in care delivery across the country. This means that patients in all States would receive the same level of high quality, appropriate care. Since 2000, on average, variation has decreased across the measures for which the NHQR tracks State data, but this progress is not uniform. For example:

- The percentage of heart attack patients who were counseled to quit smoking has increased from 42.7% in 2000-2001 to 90.9% in 2005. Moreover, 48 States, Puerto Rico, and the District of Columbia all performed above 80% on this measure in 2005.
- Yet, in 2000, diabetic patients in the worst performing State versus the best performing State were admitted to the hospital 7.6 times more often with their diabetes out of control. By 2004, this difference had doubled to 14. If all States had reached the level of the top four best performing States, at least 39,000 fewer patients would have been admitted for uncontrolled diabetes in 2004, with a potential cost savings of $216.7 million.

One of the key functions of the NHQR is to track the Nation's progress in providing safe health care. Five years after the first NHQR, and 7 years after the Institute of Medicine's landmark publication *To Err Is Human*, it is still difficult to document progress, although more information than ever now exists on patient safety. From 2000 to 2005, patient safety improved at an annual rate of only 1%.

Measuring efficiency in health care is complex and often depends on one's perspective. This NHQR offers an initial evaluation of efficiency at the national level, providing several data-based perspectives on its possible measurement. There is still much room for progress in advancing the development of better measurement tools that can help assess whether Americans are obtaining true value in health care.

Key Themes and Highlights From the National Healthcare Quality Report

Since 2003, the Agency for Healthcare Research and Quality (AHRQ), together with its partners in the Department of Health and Human Services (HHS), has reported on progress and opportunities for improving health care quality. With this fifth annual National Healthcare Quality Report (NHQR), these reports will have provided more than 50,000 data points about health care quality in the United States. Has it made a difference? Have Federal and State governmental agencies, provider organizations, insurers, and employers made progress in improving health care quality and safety? While every previous release of the NHQR has attempted to summarize the direction in which health care quality is going, this fifth report tries to summarize the progress that has been made and the remaining challenges to improve health care quality in this Nation.

The NHQR is built on 218 measures categorized across four dimensions of quality—effectiveness, patient safety, timeliness, and patient centeredness. This year's report focuses on the state of health care quality for a group of 41 core report measures that represent the most important and scientifically credible measures of quality for the Nation, as selected by the HHS Interagency Work Group.[i] The distillation of 41 core measures for the 2007 report provides a more readily understandable summary and explanation of the key results derived from the data.[ii] While the measures selected for inclusion in the NHQR are derived from the most current scientific knowledge, this knowledge base is not evenly distributed across health care. The analysis in the following pages centers on measures for which data are available from the baseline year of 2000 or 2001 and the comparison year of 2004 or 2005.

Three themes that emerge from the 2007 NHQR emphasize the need to accelerate progress in achieving high quality health care:

- Health care quality continues to improve, but the rate of improvement has slowed.
- Variation in quality of health care across the Nation is decreasing, but not for all measures.
- The safety of health care has improved since 2000, but more needs to be done.

[i] The HHS Interagency Work Group, which represents 18 HHS agencies and offices, was formed to provide advice and support to AHRQ and the National Reports team.

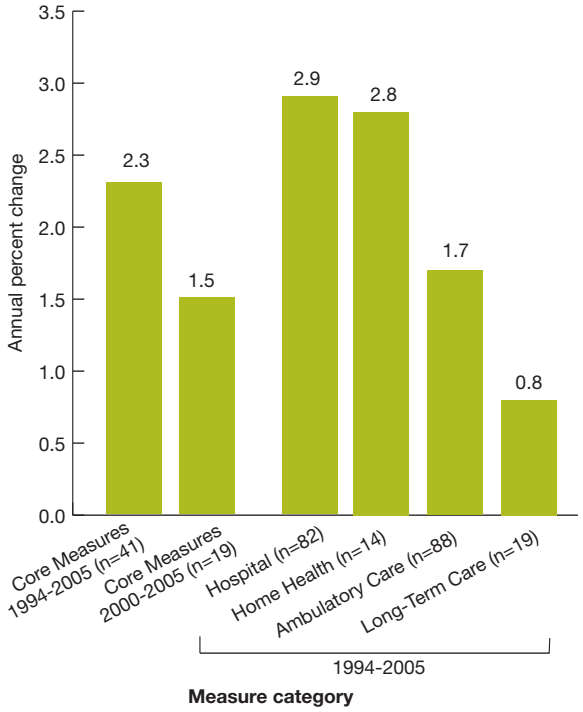
[ii] Data on all NHQR measures are available in the Data Tables Appendix at www.ahrq.gov/qual/measurix.htm.

Health Care Quality Continues To Improve, But the Rate of Improvement Has Slowed

For the past 5 years, the NHQR has summarized trends in health care quality. This is a difficult undertaking, as there is no single national health care quality survey that collects a standard set of data elements from a uniform population over the same time period. Rather, data are available from a wide range of sources that focus on different populations and data years.

In order to track the progress of health care quality in this country, the NHQR presents an annual rate of change in quality, which represents how quickly the health care system is making improvements across the report's core measures. Another way to describe this is the speed of improvement in the U.S. health care system. Based on these core report measures, quality of care continues to improve. However, the rate of improvement seems to be slowing.

Figure H.1. Median rate of change overall and by care setting, 1994-2005 and 2000-2005



Note: Available data years for the 1994-2005 analysis vary based on the specific measure, as not all measures have data for every data year. Details on the measures included in these rates of change are presented in the NHQR Measure Specifications Appendix.

- The annual median rate of change for all core measures, which span the years 1994 to 2005, is 2.3%[iii] (Figure H.1).
- More recently, the rate of improvement has slowed. From 2000 to 2005, the annual median rate of change for measures with available data was 1.5%.
- As reported in last year's NHQR, however, most measures show some improvement. Of the 41 core measures reported above with data that span 1994 to 2005, 27 improved, 6 declined, and 6 are unchanged.

[iii] Not all data sources provide data for each year from 1994 through 2005: 1994 is the earliest data year for any data source reported in the 2007 NHQR Data Tables Appendix, and 2006 is the latest data year for any data source reported in the 2007 NHQR Data Tables Appendix.

When examining change across multiple diseases and care settings, it is difficult to understand why changes in performance occur. In the analysis of trends for this year's NHQR, it is clear that some areas have shown increasing rates of improvement while others have slowed. For example, the rate of improvement in heart disease treatment increased from 3.3% to 5.6% (1994-2005 versus 2000-2005). However, the rate of improvement in diabetes slowed from 1.2% to 0.6%. Initiatives such as public reporting and strong advocacy from multiple stakeholders in support of quality are circumstances that may influence broad system change and subsequent quality improvements in certain areas. However, these data show that sustaining a steady rate of improvement over time is a challenge.

Variation in Quality of Health Care Across the Nation Is Decreasing, But Not for All Measures

One goal of quality improvement efforts nationally is to reduce differences in health care quality that patients receive in one State versus another. There is no justification, for example, for a patient hospitalized for a heart attack in California to have different care than a patient in Alabama. Yet, analyses from the NHQR, its companion National Healthcare Disparities Report (NHDR), other organizations, and the health care literature in general have shown that the quality of care that patients receive varies significantly across the country. This variability is evident in multiple dimensions, according to many different factors, such as social and demographic characteristics of patient populations, hospital types (e.g., urban, rural, teaching, non-teaching), and different clinical areas (e.g., heart disease, pneumonia, clinical preventive services).[1, 2, 3]

For the past 20 years, a central focus of quality improvement efforts has been to bring care for all patients to a minimum quality standard based on evidence.[4] Reporting on unwarranted variation across States in health care quality has been part of past NHQRs. The NHQR is a rich source of information on quality of care across the 104 measures for which State level information is available. This year's NHQR examines whether progress is being made at reducing variation in care for the time period 2000 to 2005.[iv]

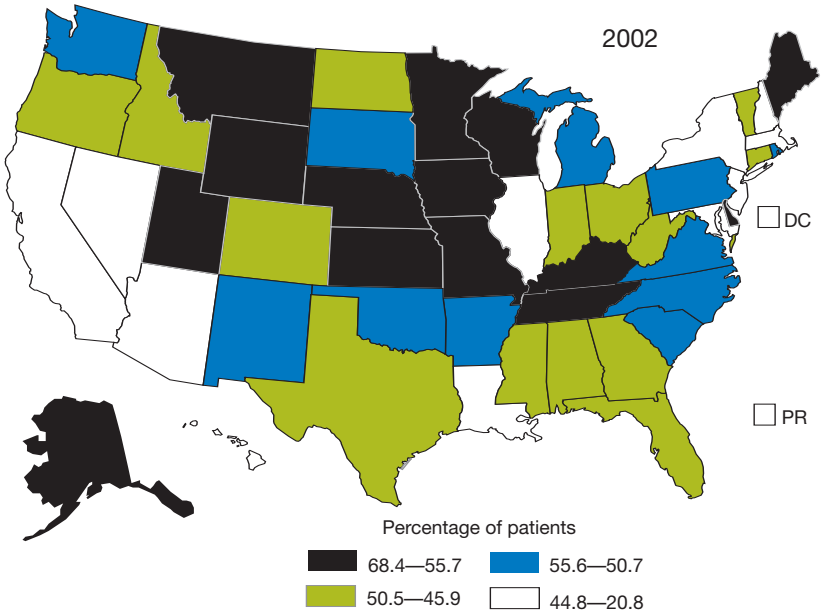
More measures have seen progress in terms of decreases in variation between the best performing State and the worst performing State between 2000 and 2005. Specifically:

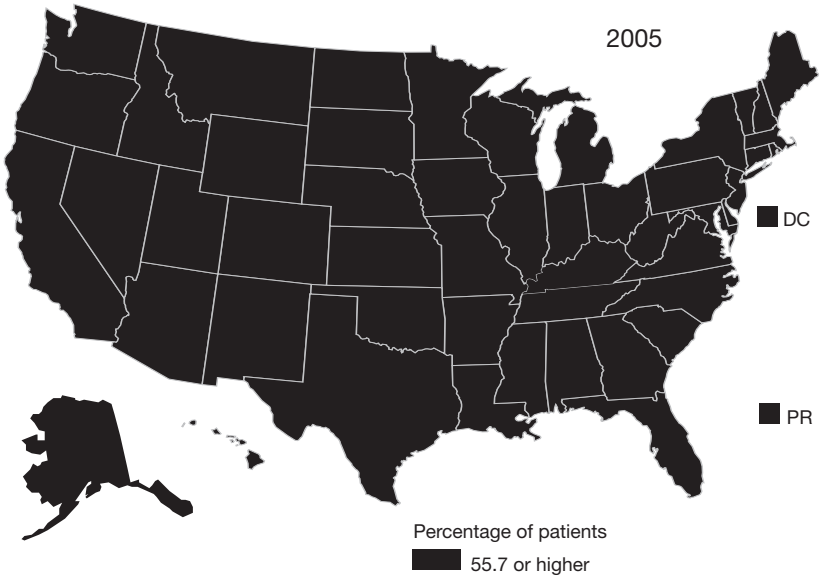
- Variability decreased for 28 measures.
- Variability increased for 13 measures.
- There was no change for 18 measures.

For example, there has been progress in standardizing high quality care across the country, such as the percentage of heart attack patients given smoking cessation counseling while in the hospital (Figure H.2).

[iv] In the past, the NHQR has presented variation in health care quality by showing measures with high ratios between the best and worst performing States. To examine whether variation was increasing, this year's NHQR examined these ratios across the 59 measures for which State data were available for 2000-2001 to 2004-2005 and for which the same States provided data for both data years. Then analysis was conducted to determine whether more measures had seen increases or decreases, or whether the ratio of best to worst State had not changed. Data were analyzed for measures on which the same States reported data for both time periods in order to ensure that appropriate comparisons were made across the same States across time.

Figure H.2. Percentage of heart attack patients given smoking cessation counseling while hospitalized, by State, 2002 and 2005





- In 2002, nationally, heart attack patients admitted to hospitals were counseled about quitting smoking less than 50% of the time.
- In 2002, the rate at which heart attack patients in hospitals were counseled to stop smoking by their doctor in the best performing State was 3.3 times higher than the rate for their counterparts in the worst performing State.
- However, over just 3 years, most States improved their performance on this measure. The latest national data (2005) show that heart attack patients admitted to hospitals are now counseled to quit smoking 91% of the time.
- In addition, the variation across the country on this measure has decreased. Figure H.2 shows that all States in 2005 had reached the level of the best performing States in 2002. In 2005, only two States were below 80% on this measure.

Although overall variation has decreased slightly, many of the measures with the most variation—that is, where patients are treated very differently based on the fact that they are in a different State—have not improved since the first NHQR. Moreover, if all States were able to achieve the highest State's performance even on these measures alone, it would mean significant advances in terms of patient care and outcomes. For example:

- In 2002, chronic care nursing home residents were restrained 8.3 times more frequently in the worst performing State than in the best performing State. In 2006, this ratio increased to 10. If all States had reached the average of the best performing State in 2006, at least 61,500 fewer residents would have been physically restrained nationwide.
- In 2000, diabetic patients were admitted to the hospital with uncontrolled diabetes 7.6 times more often in the worst performing State than in the best performing State. By 2004, this difference had nearly doubled, with uncontrolled diabetes admissions per 100,000 population in the worst performing State 14 times higher than in the best performing State. If all States had reached the level of the four best performing States in 2004, almost 39,000 fewer patients would have been admitted for uncontrolled diabetes, with a potential cost savings of $216.7 million.
- While some States may never be able to achieve the performance of the top States because of differences in their population's health risks, we know from this analysis and from other research that considerable costs,[5, 6, 7] are incurred as a result of hospitalizations and other health services that are potentially avoidable.

The Safety of Health Care Has Improved Since 2000, But More Needs To Be Done

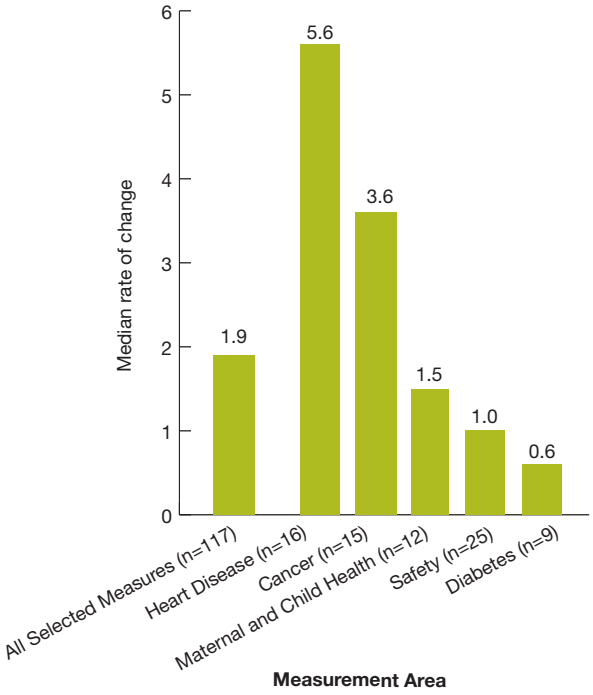
For 5 years, the National Healthcare Quality and Disparities Reports have presented a snapshot of the safety of health care provided to the American people. This analysis has been based on an emerging set of databases that were created to respond to the need for information documented in such publications as the Institute of Medicine's landmark 2000 report *To Err Is Human*.[8] Today a clearer picture of trends in health care safety is only beginning to emerge. In part, this results from the intense complexity required to accurately assess and ensure complete reporting on medical errors and patient safety events.

Key databases developed to date that have enhanced the current knowledge base on patient safety nationally include the Medicare Patient Safety Monitoring System, AHRQ's Healthcare Cost and Utilization Project's Patient Safety Indicators, and the National Nosocomial Infections Surveillance System.[v] While these have been developed or expanded only in recent years, results from these efforts contribute to the trends that can be drawn from the 5 years of reporting on patient safety in the NHQR.

[v] Data sources for patient safety information contained in the National Healthcare Quality and Disparities Reports:

- The Quality Improvement Organization Program, Centers for Medicare & Medicaid Services.
- The Medicare Patient Safety Monitoring System, Centers for Medicare & Medicaid Services.
- The Healthcare Cost and Utilization Project, AHRQ.
- The National Nosocomial Infections Surveillance System, a cooperative, nonfinancial relationship between hospitals and the Centers for Disease Control and Prevention.

Figure H.3. Median annual rate of change in quality by measurement area, 2000-2005



- Safety improved slightly between 2000 and 2005 at an annual rate of 1% improvement (Figure H.3).
- However, during that same time period, other areas of health care improved at significantly greater rates, with care for heart disease improving at 5.6% during this time and care across all measures with available data improving at nearly double the rate of improvement for safety.
- Areas where significant attention has been concentrated, such as the appropriate timing of antibiotics for surgery and reducing medication errors, have shown progress. Specifically:
  - Over 30% more patients received appropriate timing for antibiotics before and after surgery in 2005 than in 2004.
  - From 2004 to 2005, adverse drug events from warfarin and low-molecular-weight heparin declined 21% and 28%, respectively.
  - Deaths following complications of care declined 2.4% from 1994 to 2004.

However, in many areas, a fraction of the information necessary to track patient safety effectively is available, and, in most cases, clinicians still lack basic monitoring information on medical errors and adverse events.[9] For example:

- Only 25 of 41 safety measures in the full NHQR measure set have data available for tracking recent trends (2000 to 2005).
- No national data systems currently report data on safety at a State or local level.
- Because adverse events and medical errors are rare events from a statistical perspective, it is difficult, using current data, to compare across time or patient groups in order to examine potential causes and possible solutions to safety issues.

National Standards, Neighborhood Solutions

The NHQR continues to present a broad examination of health care quality in the United States. As noted above, while quality continues to improve across most measures, the pace of change has slowed. Improvements have been demonstrated in such areas as patient safety and care for certain diseases and populations. However, these improvements have not been realized across all populations or across the entire country. Moreover, even in areas where progress has occurred, significant effort is needed to ensure that adequate systems are in place to track progress and use the data for improvement.

A number of major efforts have begun to accomplish this goal of using data for improvement. Specifically:

The President signed the **Patient Safety and Quality Improvement Act of 2005** (Patient Safety Act) to spur the development of voluntary, provider-driven initiatives to improve the quality, safety, and outcomes of patient care. The Act, which will be implemented by AHRQ and the HHS Office for Civil Rights, addresses many of the current barriers to improving patient care. All too often, health care providers fear that if they participate in the analysis of medical errors or patient care processes, the findings may be used against them in court or harm their professional reputations. The reluctance of providers to participate in improvement initiatives, combined with the difficulty of aggregating and sharing data confidentially across facilities or State lines, limits our current ability to aggregate data in sufficient numbers to identify rapidly the most prevalent risks and hazards in the delivery of patient care, their underlying causes, and practices that are most effective in mitigating them.

The Patient Safety Act addresses these barriers to improvement through the following goals and mechanisms:

- Encourage greater health care provider participation in improvement initiatives by establishing strong, nationally uniform confidentiality and privilege protections for the patient safety information that these initiatives assemble or develop.
- Expand the analytic expertise that is available to health care providers to analyze safety and quality issues by encouraging the formation of new patient safety organizations (PSOs) with which providers can voluntarily work.
- Improve our ability to rapidly recognize and address the underlying causes of risks and hazards to patient care by facilitating the aggregation and analysis of large numbers of patient safety events.

The Patient Safety Act directs the Secretary to develop regional and national statistics and trends for reporting in future NHQRs. AHRQ will carry out these activities on behalf of the Secretary and is required to develop this information through the aggregation and analysis of non-identifiable patient safety data that PSOs, providers, and others voluntarily contribute to a network of patient safety databases that the statute envisions.

Creating ways that data can be used for benchmarking and improvement is a key step in driving quality improvement. AHRQ's **State Snapshots** Web tool was launched in 2005. It is an application that helps State health leaders, researchers, consumers, and others understand the status of health care quality in individual States. The 51 State Snapshots—for every State plus the District of Columbia—are based on 129 quality measures, each of which evaluates a different segment of health care performance and shows each State's strengths and weaknesses. Although the measures are the products of complex statistical formulas, they are expressed on the Web site as simple, five-color graphical "performance meters." The State Snapshots provide summaries that measure health care quality in three different contexts: by type of care (such as preventive, acute, or chronic care), by setting of care (such as nursing homes or hospitals), and by clinical area (such as care for patients with cancer, diabetes, or respiratory diseases). After selecting a State on a national map, users can view whether that State has improved or worsened compared with other States in a particular area of

health care delivery. The 129 measures range from preventing bed sores to screening for diabetes-related foot problems to providing antibiotics quickly to hospitalized pneumonia patients. The State Snapshots also allow users to compare a State's performance against that of other States in the same region and to see how a State compares against best performing States.

The release of this year's State Snapshots is complemented by the launch of NHQRnet and NHDRnet, a pair of new, interactive Web-based tools for searching AHRQ's storehouse of national health care data. These online search engines allow users to create spreadsheets and customize searches of information in the NHQR and NHDR.

Efforts To Improve Measures and Data

The measures and data used in these reports come from a variety of sources within HHS and elsewhere. Performance measures are central to ongoing efforts to improve the quality of care within this country. Yet, despite progress in quality improvement, a number of challenges remain related to the current state of the science in the performance measurement field, including the following:

- Inadequately developed measures that lack reliability and validity can lead to inaccuracies in determining the presence or absence of quality.
- The existence of multiple and, at times, conflicting performance measures that are neither uniform nor standardized may cause confusion.
- Measure maintenance is an issue as the evidence base of measures is refined and expanded.
- The burden of data collection for performance measurement is a growing concern.

Efforts by HHS to address these and other concerns related to improving performance measures and data have been ongoing. For instance, results of validation studies for measures, including field testing, expert panel review, focus group testing, and the like, have provided insights that significantly contributed to measure refinement and, in other cases, demonstrated the reliability and accuracy of the existing performance measures.

Research that develops new scientific evidence has also contributed to the improvement of measures and can provide fruitful avenues for measure development. Agencies within HHS have also worked with a number of stakeholders, such as measure developers, consumers, purchasers, various quality alliances, and the National Quality Forum, to come to consensus around a core set of measures that can be used to report quality. This collaboration helps to harmonize measures and provides a forum for discussions on the current state of measurement. A key area is identifying gaps that, if filled, will provide a comprehensive picture of performance in health care. Another key area is identifying state-of-the-art methods, such as risk adjustment methodologies, that can enhance performance measures to provide an unbiased representation of quality.

HHS is also exploring other opportunities to reduce the burden of collecting the data necessary for performance measurement and quality improvement activities. Of particular interest is research that explores cost-efficient approaches to data collection, such as standardization of common data elements contained in the electronic health record. These data elements may enhance existing performance measures, making them more reliable and accurate. They also can make performance data collection a useful and automatic byproduct of the care delivered rather than an independent activity. This change can enable doctors, nurses, and other health care professionals to spend more time caring for patients.

Performance measurement is a tool for continuous quality improvement, and the broad areas cited above depict some of the continuing activities HHS is currently supporting in its efforts to improve and enhance the quality of care delivered within the United States.

Efforts To Make Patients' Lives Better

The NHQR concentrates on the national view of health care quality. This view of health care quality is often far removed from the daily reality faced by health care providers and patients in clinics and hospitals. At the same time, however, the statistics that are reported in the National Healthcare Quality and Disparities Reports reflect the everyday experiences of patients and their doctors and nurses across the Nation. It makes a difference in people's lives when breast cancer is diagnosed early with timely mammography; when a patient suffering from a heart attack is given the correct life-saving treatment in a timely fashion; when medications are correctly administered; and when doctors listen to their patients, show them respect, and answer their questions.

These are the statistics that are reported in this year's NHQR. This report documents important progress in making patients' lives better. At the same time, however, it highlights many areas where much more could be done to use the data in the National Healthcare Quality and Disparities Reports to target policy and clinical interventions to improve care. Each of the 50,000 data points that have been produced and reported during the past 5 years represents groups of patients across the country. The hope is that the next 5 years will see greater use of data for decision-making, so that those patients begin to experience true quality improvement in American health care.

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Chapter 1. Introduction and Methods

This is the fifth annual report produced by the U.S. Department of Health and Human Services (HHS) on the state of health care quality nationally. It is designed to summarize data across a wide range of patient needs, from staying healthy, to getting better, to living with illness and disability, to coping with the end of life. It tracks quality across nine condition areas and tells the reader how effective, safe, timely, and patient centered care is in America today. The National Healthcare Quality Report (NHQR) presents data at the national level and at the State level where State level data are available. Most important, this fifth report presents how far the Nation has—or has not—come in the past 5 years in improving the quality of health care in the United States.

In 1999, Congress directed the Agency for Healthcare Research and Quality (AHRQ) to produce an annual report, starting in 2003, on health care quality in the United States. AHRQ, with support from HHS and private sector partners, designed and produced the NHQR to respond to this legislative mandate.

The first NHQR, released in 2003, was a comprehensive national overview of the quality of health care received by the general U.S. population. The 2004 NHQR initiated a second critical goal of the report series—tracking the Nation's quality improvement progress. The 2005 NHQR introduced a set of core measures and a variety of new composite measures. The 2006 NHQR continued to improve data, measures, and methods, adding new databases and measures and refining methods for quantifying and tracking changes in health care.

This 2007 NHQR continues to focus on a subset of core measures that includes the most important and scientifically supported measures in the full NHQR measure set. In addition, new supplemental measures are included that complement core measures in key areas. Finally, as in previous NHQRs, references have been systematically updated (that is, annual reports and other regularly released publications have been updated as appropriate, and a wide breadth of peer-reviewed journals and electronically published articles have been searched for inclusion as references).

This chapter summarizes the methodological approaches AHRQ has taken in producing the 2007 NHQR. Issues related to changes in measures, additional data sources, and modifications to presentation format are summarized below. Material that is new in this year's report is specifically highlighted and includes:

- A new chapter and measures on the efficiency dimension of care.
- New data sources and measures for:
  - Cancer care.
  - HIV testing.
  - Nursing home, home health, and hospice care.

As in previous years, the 2007 NHQR was written by AHRQ staff, with the support of AHRQ's National Advisory Council and the Interagency Work Group for the NHQR.

How This Report Is Organized

The basic structure of the report consists of the following:

- **Highlights** summarizes key themes and highlights from the 2007 report.
- **Chapter 1: Introduction and Methods** documents the organization, data sources, and methods used in the 2007 report and describes major changes from previous reports.
- **Chapter 2: Effectiveness** examines the quality of health care in the general U.S. population, focusing on nine clinical conditions or care settings based largely on Healthy People 2010 condition areas. Measures of the quality of health care used in this chapter are identical to measures used in the National Healthcare Disparities Report (NHDR) except when data to examine disparities are unavailable for inclusion in the NHDR.
- **Chapter 3: Patient Safety** tracks measures of patient safety, including postoperative complications, other complications of hospital care, and complications of medications.
- **Chapter 4: Timeliness** examines the delivery of time-sensitive clinical care and patient perceptions of the timeliness and accessibility of their care.
- **Chapter 5: Patient Centeredness** tracks patients' experiences with care in an office or clinic and satisfaction with communication during a hospital stay in order to incorporate the patient's experience and perspective into the report.
- **Chapter 6: Efficiency** presents a conceptual view and an initial analysis of this dimension of health care performance that has been missing from previous releases of the NHQR.

Appendixes are available online (www.ahrq.gov) and include the following:

- **Appendix A: Data Sources** provides information about each database analyzed for the NHQR, including data type, sample design, and primary content.
- **Appendix B: Measure Specifications** provides information about how to generate each measure analyzed for the NHQR. Measures highlighted in the report are described, as well as other measures that were examined but not included in the text of the report.
- **Appendix C: Data Tables** provides detailed tables for most measures analyzed for the NHQR, including measures highlighted in the report text and measures examined but not included in the text. A few measures cannot support detailed tables and are not included in the appendix.[i]

[i] NHQR data can now be accessed through NHQRnet, an online tool that provides Internet users with an opportunity to specify dimensions of analysis and produce data tables. NHQRnet is available through the AHRQ Web site at http://nhqrnet.ahrq.gov/nhqr/jsp/nhqr.jsp.

Measure Set for the NHQR and NHDR

Core and Composite Measures

As in previous years, the 2007 reports focus on a subset of core report measures. In addition, composite measures are included to provide readers with a summarized picture of some aspect of health care by combining information from multiple component measures.

Core measures. For the 2005 reports, the Interagency Work Group selected a group of core measures from the full measure sets on which the reports would present findings each year. In 2006, the work group made additional changes to the core measure set. For some topics, the NHQR uses alternating sets of core measures. These measures, which relate to cancer prevention and childhood preventive services, are listed in Table 1.1.

Table 1.1. Alternating core measures

Reported in 2006 NHQR & NHDR*	Reported in 2007 NHQR & NHDR
Colorectal cancer screening	Breast cancer screening (mammography)
Colorectal cancer mortality	Breast cancer mortality
Late stage colorectal cancer	Late stage breast cancers
Children who had a vision check	Children who had dental care

* The measures listed in this column will be reported again in the 2008 reports.

All core measures fall into two categories: *process* measures, which track receipt of medical services, and *outcome* measures, which in part reflect the results of medical care. Both types of measures are not reported for all conditions due to data limitations. For example, data on HIV care are suboptimal; hence, no HIV process measures are included as core measures. In addition, not all core measures are included in trending analysis, because 2 or more years of data were not always available. A complete list of the 2007 NHQR core measure set is presented in Table 1.2.

Table 1.2. Core process and outcome measures

Section	Process measures	Outcome measures
Effectiveness - Cancer	• Women age 40 and over who reported they had a mammogram within the past 2 years	• Rate of breast cancer incidence per 100,000 women age 40 and over diagnosed at advanced stage • Cancer deaths per 100,000 women per year for breast cancer
Effectiveness - Diabetes	• Composite: Adults age 40 and over with diabetes who had all 3 recommended services for diabetes in the past year (at least 1 hemoglobin A1c measurement, a retinal eye examination, and a foot examination)	• Hospital admissions for lower extremity amputation in patients with diabetes per 100,000 population
Effectiveness - End Stage Renal Disease	• Dialysis patients registered on waiting list for transplantation	• Hemodialysis patients with adequate dialysis (urea reduction ratio 65% or greater)
Effectiveness – Heart Disease	• Composite: Patients with acute myocardial infarction (AMI) who received recommended hospital care for AMI (administered aspirin and beta blocker within 24 hours of admission, prescribed aspirin and beta blocker at discharge, and given smoking cessation counseling while hospitalized)[a] • Composite: Heart failure patients who received recommended hospital care for heart failure (evaluation of left ventricular ejection fraction and prescribed ACE inhibitor or ARB at discharge, if indicated, for left ventricular systolic dysfunction)[a] • Current smokers age 18 and over receiving advice to quit smoking • Adults who were obese who were given advice about exercise	• AMI mortality rate (number of deaths per 1,000 discharges for AMI)
Effectiveness – HIV and AIDS		• New AIDS cases per 100,000 population age 13 and over
Effectiveness – Maternal and Child Health	• Pregnant women receiving prenatal care in first trimester • Children 19-35 months who received all recommended vaccines • Children ages 2-17 who received advice from a doctor or other health provider about healthy eating • Children ages 2-17 who had a dental visit in the past year	• Infant mortality per 1,000 live births, birthweight <1,500 grams • Hospital admissions for pediatric gastroenteritis per 100,000 population ages 4 months-17 years

Table 1.2. Core process and outcome measures *(continued)*

Section	Process measures	Outcome measures
Effectiveness – Mental Health and Substance Abuse	• Adults age 18 and over with major depressive episode in the past year who received treatment for depression in the past year • Persons age 12 and over who needed treatment for any illicit drug use and who received such treatment at a specialty facility in the past year	• Deaths due to suicide per 100,000 population • Persons age 12 and over receiving substance abuse treatment who completed treatment course
Effectiveness – Respiratory Diseases	• Adults age 65 and over who ever received pneumococcal vaccination • Composite: Pneumonia patients who received recommended hospital care for pneumonia (blood cultures collected before antibiotics administered, received initial antibiotic dose within 4 hours of hospital arrival and consistent with current recommendations, and received screening for influenza and pneumococcal disease vaccination status and vaccination, if indicated)[b] • Visits where antibiotics were prescribed for a diagnosis of common cold per 10,000 population	• TB patients who complete a curative course of treatment within 12 months of initiation of treatment • Hospital admissions for pediatric asthma per 100,000 population ages 2-17
Effectiveness – Nursing Home, Home Health, and Hospice Care	• Long-stay nursing home residents who were physically restrained	• High-risk long-stay nursing home residents who have pressure sores • Low-risk long-stay nursing home residents who have pressure sores • Home health care patients who get better at walking or moving around • Home health care patients who had to be admitted to the hospital
Patient Safety	• Composite: Adult Medicare patients having surgery who received appropriate timing of antibiotics • Percent of community-dwelling adults age 65 and over who had at least 1 prescription (from a list of 33 medications) that is potentially inappropriate for the elderly	• Composite: Adult surgery patients with postoperative complications (postoperative pneumonia, catheter-associated urinary tract infection,[c] or venous thromboembolic events) • Bloodstream infections or mechanical adverse events associated with central venous catheters

Table 1.2. Core process and outcome measures *(continued)*

Section	Process measures	Outcome measures
Timeliness		• Adults who can sometimes or never get care for illness or injury as soon as wanted • Emergency department visits where patients left without being seen
Patient Centeredness	• Composite: Adults who sometimes or never received patient centered care (whose health providers sometimes or never listened carefully, explained things clearly, respected what they had to say, and spent enough time with them) • Composite: Children who sometimes or never received patient centered care (whose health providers sometimes or never listened carefully, explained things clearly, respected what their parents had to say, and spent enough time with them)	

[a] Use of angiotensin converting enzyme (ACE) inhibitors in patients with left ventricular systolic dysfunction was changed to also include angiotensin receptor blockers (ARBs) as an acceptable alternative.

[b] Appropriate antibiotic selection was changed to exclude patients with health-care-associated pneumonia from the denominator used in the calculation. Collection of samples for blood culture within 24 hours of hospital arrival was changed so that only those patients who were admitted to the intensive care unit within 24 hours of hospital arrival are included in the denominator.

[c] The individual measure for postoperative urinary tract infection was refined to include only patients with catheter-associated urinary tract infections.

Composite measures. More than one measure can be combined to form a single composite measure of health care quality. A composite measure summarizes care that is represented by individual measures that are often related in some way, such as components of care for a particular disease or illness. Policymakers and others have voiced their support for composite measures because they can be used to facilitate understanding of information from many individual measures. The effort to develop new composites is ongoing and, in 2006, a number of new composite measures were added.[ii] Composite measures, which now make up about 20% of the core measures, are listed in Table 1.3.

Composite measures in the NHQR are created based on two different models—the appropriateness model or the opportunities model. When possible, an appropriateness model is used to create composite measures. It is sometimes referred to as the "all-or-none" approach, because it is calculated based on the number of patients who received all appropriate care. One example of this model is the diabetes composite, in which a patient who receives only one or two of the three services would not be counted as having received the recommended care.

[ii] See Chapter 1, Introduction and Methods, in the 2006 NHQR for more detailed information about these and other methods used to calculate composite measures used in the reports.

In cases where insufficient data are available to apply an appropriateness model, an opportunities model may be applied. The opportunities model assumes that each patient needs and has the opportunity to receive one or more processes of care but that not all patients need the same care. Composite measures that use this model summarize the proportion of appropriate care that is delivered. The denominator for an opportunities model composite is the sum of opportunities to receive appropriate care across a panel of process measures. The numerator is the sum of the components of appropriate care that are actually delivered. The composite measure of recommended hospital care for heart attack is an example where this model is applied. The total number of patients who actually receive treatments represented by individual components of the composite measure (e.g., aspirin therapy within 24 hours, beta blocker within 24 hours, smoking cessation counseling) is divided by the sum of all of these opportunities to receive appropriate care.

Measures from the CAHPS® (Consumer Assessment of Healthcare Providers and Systems) surveys have their own method for computing composite measures that has been in use for many years. These composite measures average individual components of patient experiences of care. They are typically presented as the proportion of respondents who reported that providers sometimes or never, usually, or always performed well.

Composite measures that relate to rates of complications of hospital care are postoperative complications and complications of central venous catheters. For these complication rate composites, an additive model is used that sums together individual complication rates. Thus, for these composites, the numerator is the sum of individual complications and the denominator is the number of patients at risk for these complications. The composite rates are presented as the overall rate of complications. The postoperative complications composite is a good example of this type of composite measure; if 50 patients had a total of 15 complications among them (regardless of their distribution), the composite score would be 30%.

Table 1.3. Composite measures in the 2007 NHQR and NHDR (updated measures in *italics*)

Composite measure	Individual measures forming composite	Model
Receipt of three recommended diabetic services	• Adults age 40 and over with diabetes who had a hemoglobin A1c measurement at least once in the past year • Adults age 40 and over with diabetes who had a retinal eye examination in the past year • Adults age 40 and over with diabetes who had a foot examination in the past year	Appropriateness
Childhood immunization	• Children 19-35 months who received 4 doses of diphtheria-pertussis-tetanus vaccine • Children 19-35 months who received at least 3 doses of polio vaccine • Children 19-35 months who received at least 1 dose of measles-mumps-rubella vaccine • Children 19-35 months who received 3 doses of Haemophilus influenzae type B vaccine • Children 19-35 months who received 3 doses of hepatitis B vaccine	Appropriateness
Recommended hospital care for heart attack[a]	• Acute myocardial infarction (AMI) patients administered aspirin within 24 hours of admission • AMI patients with aspirin prescribed at discharge • AMI patients administered beta blocker within 24 hours of admission • AMI patients with beta blocker prescribed at discharge • AMI patients with left ventricular systolic dysfunction prescribed ACE inhibitor or ARB at discharge • AMI patients with a history of smoking in the past year who received smoking cessation counseling	Opportunities
Recommended hospital care for heart failure[a]	• Heart failure patients who received evaluation of left ventricular ejection fraction • Heart failure patients with left ventricular systolic dysfunction prescribed ACE inhibitor or ARB at discharge	Opportunities
Recommended hospital care for pneumonia[b]	• Patients with pneumonia who received the initial antibiotic dose within 4 hours of hospital arrival • Patients with pneumonia who received the initial antibiotic consistent with current recommendations • Patients with pneumonia who had blood cultures collected before antibiotics were administered • Patients with pneumonia who received influenza screening or vaccination • Patients with pneumonia who received pneumococcal screening or vaccination	Opportunities

Table 1.3. Composite measures in the 2007 NHQR and NHDR (updated measures in *italics*) *(continued)*

Composite measure	Individual measures forming composite	Model
Timing of antibiotics to prevent postoperative wound infection	• Adult Medicare patients having surgery who received prophylactic antibiotics within 1 hour prior to surgical incision • Adult Medicare patients having surgery who had prophylactic antibiotics discontinued within 24 hours after surgery end time	Opportunities
Patient experience of care	• Adults whose providers sometimes or never listened carefully to them • Adults whose providers sometimes or never explained things in a way they could understand • Adults whose providers sometimes or never showed respect for what they had to say • Adults whose providers sometimes or never spent enough time with them • Children whose parents report that their child's providers sometimes or never listened carefully to them • Children whose parents report that their child's providers sometimes or never explained things in a way they could understand • Children whose parents report that their child's providers sometimes or never showed respect for what they had to say • Children whose parents report that their child's providers sometimes or never spent enough time with them	CAHPS®
Communication with doctors in the hospital (for adults with a hospitalization)	• Adults whose doctors sometimes or never showed respect for what they had to say • Adults whose doctors sometimes or never listened carefully to them • Adults whose doctors sometimes or never explained things clearly	CAHPS®
Communication with nurses in the hospital (for adults with a hospitalization)	• Adults whose nurses sometimes or never treated them with courtesy and respect • Adults whose nurses sometimes or never listened carefully to them • Adults whose nurses sometimes or never explained things in a way they could understand	CAHPS®

Table 1.3. Composite measures in the 2007 NHQR and NHDR (updated measures in *italics*) *(continued)*

Composite measure	Individual measures forming composite	Model
Communication about medications in the hospital (for adults with a hospitalization)	• Hospital staff sometimes or never had good communication about what a new medication was for • Hospital staff sometimes or never described possible side effects of a new medicine in a way patients could understand	CAHPS®
Discharge information from the hospital (for adults with a hospitalization)	• Hospital staff talked about whether patient would have needed help after leaving the hospital • Hospital staff provided information in writing about what symptoms or health problems to look for after leaving the hospital	CAHPS®
Postoperative complications[c]	• Adult surgery patients with postoperative pneumonia events • Adult surgery patients with catheter-associated urinary tract infection • Adult surgery patients with postoperative venous thromboembolic events	Additive
Complications of central venous catheters	• Bloodstream infections associated with central venous catheters • Mechanical adverse events associated with central venous catheters	Additive

[a] Use of angiotensin converting enzyme (ACE) inhibitors in patients with left ventricular systolic dysfunction was changed to also include angiotensin receptor blockers (ARBs) as an acceptable alternative.

[b] Appropriate antibiotic selection was changed to exclude patients with health-care-associated pneumonia from the denominator used in the calculation. Collection of samples for blood culture within 24 hours of hospital arrival was changed so that only those patients who were admitted to the intensive care unit within 24 hours of hospital arrival are included in the denominator.

[c] The individual measure for postoperative urinary tract infection was refined to include only patients with catheter-associated urinary tract infections.

Presentation. As in past reports, the NHQR and its companion NHDR continue to be formatted as chartbooks. Each section in the 2007 report begins with a description of the importance of the section's topic in a standardized format. After introductory text, charts and accompanying findings highlight a small number of measures relevant to the topic. Sometimes these charts show contrasts by age when age data are available and relevant. Age comparisons are often made to a reference group, which is the age group with the largest population (for most measures, adults ages 18-44).

Almost all core measures and composite measures have multiple years of data, so figures typically illustrate trends over time. Figures include a notation about the "reference population" for population-based measures and about the "denominator" for measures based on services or events from provider- or establishment-based data collection efforts.

As in last year's report, findings presented in the text meet report criteria for importance.[iii] Often, large differences between age groups did not meet criteria for statistical significance because of small sample sizes. In addition, significance testing used in this report does not take into account multiple comparisons. To place findings in the context of other Federal reporting initiatives, this report indicates where NHQR measures are also included in Healthy People 2010.

[iii] Criteria for importance are that the difference is statistically significant at the alpha=0.05 level, two-tailed test and that the relative difference is at least 10% different from the reference group when framed positively as a favorable outcome or negatively as an adverse outcome.

Measures of effectiveness for each condition or care setting area are organized further into categories that reflect the patient's need for preventive care, treatment of illness, and management of chronic conditions. Further detail on each of these categories and the measures included can be found in Chapter 2, Effectiveness.

Changes to the Measure Set

The measure sets used in the 2007 NHQR and NHDR have been improved in several ways. A handful of measures were modified to reflect changing standards of care or improved information about care. Although no additional core measures were added, some supplemental measures are being presented in the reports for the first time in 2007.

Modifications of existing composite measures. Some individual components of composite measures were modified for the 2007 reports. The changes affect the comparability of data over time for each measure to varying degrees. This year, the following core composite measures of effectiveness and patient safety underwent modifications:

- Recommended hospital care received by patients with acute myocardial infarction—The individual measure on use of angiotensin converting enzyme (ACE) inhibitors in patients with left ventricular systolic dysfunction was changed to also include angiotensin receptor blockers (ARBs) as an acceptable alternative.
- Recommended hospital care received by patients with heart failure—The individual measure on use of ACE inhibitors in patients with left ventricular systolic dysfunction was changed to also include ARBs as an acceptable alternative.
- Recommended hospital care received by patients with pneumonia—Two component measures underwent revision:
  - The individual measure of appropriate antibiotic selection for community-acquired pneumonia was changed to exclude patients with health-care-associated pneumonia from the denominator used in the calculation.
  - The individual measure for the collection of samples for blood culture within 24 hours of hospital arrival was changed so that only those patients who were admitted to the intensive care unit within 24 hours of hospital arrival are included in the denominator.
- Postoperative care composite—The individual measure for postoperative urinary tract infection was refined to include only patients with catheter-associated urinary tract infections.

New measures. A number of new supplemental (non-core) measures have been included in the 2007 NHQR to fill identified gaps, including:

- Three measures of recommended care for breast or colon cancer from the American Cancer Society and American College of Surgeons National Cancer Data Base (NCDB):
  - Radiation therapy within 1 year of diagnosis for women with breast cancer receiving breast-conserving surgery.
  - Axillary node dissection or sentinel lymph node biopsy at the time of lumpectomy or mastectomy for women with Stage I-IIb breast cancer.
  - Surgical resection of colon cancer that included at least 12 lymph nodes.

- Three measures of HIV testing from the Centers for Disease Control and Prevention (CDC), National Center for Health Statistics (NCHS) National Survey of Family Growth (NSFG):
  - Women ages 15-44 who completed a pregnancy in the last 12 months and had an HIV test as part of prenatal care.
  - People ages 15-44 who ever had an HIV test outside of blood donation.
  - People ages 15-44 with any HIV risk behaviors in the last 12 months who had an HIV test outside of blood donation in the last 12 months.
- An individual measure of the adequacy of pain management for nursing home residents from the CDC-NCHS National Nursing Home Survey (NNHS):
  - Pain management for nursing home residents with moderate, severe, or excruciating pain. Because this is not a periodic survey, findings are presented in the 2007 report only.

Measure revisions were proposed and reviewed in meetings of the Interagency Work Group for the NHQR, which includes representation from across HHS.

Other Improvements in This Report

Consistent with the goal of improving the quality of and access to health care for all Americans, a number of improvements in the value and accessibility of the NHQR are made from year to year. Improvements this year include the addition of new data sources, a new chapter on the efficiency of health care, and expanded analysis of trends.

Addition of New Data Sources

NHQR data sources include surveys of individuals and health care facilities; data are also extracted from surveillance, vital statistics, and health care organization data systems (Table 1.4). Standardized suppression criteria were applied to all databases to support reliable estimates.[iv] New data added this year come from the following:

- **National Cancer Data Base.** The NCDB, jointly sponsored by the American College of Surgeons and the American Cancer Society, is a national hospital-based cancer registry. The NCDB includes approximately 75% of U.S. cancer cases and collects data from more than 1,400 hospitals that have cancer treatment programs approved by the Commission on Cancer. The NCDB serves as a comprehensive clinical surveillance resource for cancer care in the United States, with the intention of improving the quality of cancer care by providing physicians, cancer registrars, and others with the means to compare their management of cancer patients with the way in which similar patients are managed in other cancer centers around the country. Data about treatment of breast and colon cancer are included in the 2007 NHQR.
- **National Survey of Family Growth.** This survey gathers information on family life, marriage and divorce, pregnancy, infertility, use of contraception, and men's and women's health. Survey data are collected by NCHS, and the results are used by HHS and others to plan health services and health education programs, as well as to perform statistical analyses of families, fertility, and reproductive health. Data about HIV testing rates from the NSFG are included in the 2007 NHQR.

[iv] Estimates based on sample sizes fewer than 30 or with relative standard error greater than 30% are considered unreliable and suppressed. Databases with more conservative suppression criteria retain their own standards.

- **National Nursing Home Survey.** The NNHS provides information on nursing homes from two perspectives: that of the provider of services and that of the recipient of care. For recipients, data were collected on demographic characteristics, health status and medications taken, services received, and sources of payment. Survey data were obtained through personal interviews with facility administrators and designated staff who used administrative records to answer questions about the facilities, staff, services, and programs; medical records were used to answer questions about the residents. The total number of nursing home facilities that participated in the 2004 NNHS is 1,174. Data about the management of pain for nursing home residents are included in the 2007 NHQR.

Table 1.4. Databases used in the 2007 reports (new databases in *italics*)

Survey data collected from populations:

- AHRQ, Medical Expenditure Panel Survey (MEPS), 2002-2004
- CAHPS® (Consumer Assessment of Healthcare Providers and Systems) Hospital Survey, 2007
- *California Health Interview Survey, 2001-2005*
- Centers for Disease Control and Prevention (CDC), Behavioral Risk Factor Surveillance System (BRFSS), 2001-2005
- CDC-NCHS, National Health and Nutrition Examination Survey (NHANES), 1999-2004
- CDC-NCHS, National Health Interview Survey (NHIS), 1998-2005
- CDC-NCHS/National Immunization Program, National Immunization Survey (NIS), 1998-2005
- *CDC-NCHS, National Survey of Family Growth (NSFG), 2002*
- Centers for Medicare & Medicaid Services (CMS), Medicare Current Beneficiary Survey (MCBS), 1998-2003
- *National Center for Education Statistics, National Assessment of Adult Literacy, Health Literacy Component, 2003*
- National Hospice and Palliative Care Organization, Family Evaluation of Hospice Care, 2005
- Substance Abuse and Mental Health Services Administration (SAMHSA), National Survey on Drug Use and Health (NSDUH), 2002-2005
- *U.S. Census Bureau, American Community Survey, 2004*

Data collected from samples of health care facilities and providers:

- *American Cancer Society and American College of Surgeons, National Cancer Data Base (NCDB), 1999-2004*
- CDC-NCHS, National Ambulatory Medical Care Survey (NAMCS), 1997-2004
- CDC-NCHS, National Hospital Ambulatory Medical Care Survey-Emergency Department (NHAMCS-ED), 1997-2004
- CDC-NCHS, National Hospital Ambulatory Medical Care Survey-Outpatient Department (NHAMCS-OPD), 1997-2004
- CDC-NCHS, National Hospital Discharge Survey (NHDS), 1998-2005
- *CDC-NCHS, National Nursing Home Survey (NNHS), 2004*
- CMS, End Stage Renal Disease Clinical Performance Measures Project (ESRD CPMP), 2001-2005
- *National Sample Survey of Registered Nurses, 2004*

Table 1.4. Databases used in the 2007 reports (new databases in *italics*) *(continued)*

Data extracted from data systems of health care organizations:
• AHRQ, Healthcare Cost and Utilization Project (HCUP) Nationwide Inpatient Sample, 1994, 1997, 2000-2004 and State Inpatient Databases,[a] 2003 and 2004
• CMS, Home Health Outcomes and Assessment Information Set (OASIS), 2002-2005
• CMS, Hospital Compare, 2006
• CMS, Medicare Patient Safety Monitoring System, 2003-2005
• CMS, Nursing Home Minimum Data Set, 2002-2005
• CMS, Quality Improvement Organization (QIO) program, Hospital Quality Alliance (HQA) measures, 2000-2004
• HIV Research Network (HIVRN) data, 2001-2003
• Indian Health Service, National Patient Information Reporting System (NPIRS), 2002-2004
• National Committee for Quality Assurance, Health Plan Employer Data and Information Set (HEDIS®), 2001-2005
• National Institutes of Health (NIH), United States Renal Data System (USRDS), 1998-2003
• SAMHSA, Treatment Episode Data Set (TEDS), 2002-2004
Data from surveillance and vital statistics systems:
• CDC-National Center for HIV, STD, and TB Prevention, HIV/AIDS Surveillance System, 1998-2005
• CDC-National Center for HIV, STD, and TB Prevention, TB Surveillance System, 1999-2003
• CDC-National Program of Cancer Registries (NPCR), 2000-2004
• CDC-NCHS, National Vital Statistics System (NVSS), 1999-2004
• NIH-National Cancer Institute, Surveillance, Epidemiology, and End Results (SEER) program, 1992-2004

[a] Not all States participate in HCUP. For details, see HCUP entry in Appendix A, Data Sources.

Note: Measures from the California Health Interview Survey, the American Community Survey, the National Assessment of Adult Literacy, and the National Sample Survey of Registered Nurses are used only in the 2007 NHDR. For details on these surveys, see Chapter 1, Introduction and Methods, in the 2007 NHDR.

Initial Findings on the Efficiency Dimension

For the first time, the 2007 NHQR presents information related to the efficiency of the U.S. health care system. Chapter 6 is the initial attempt to address this topic, which the Institute of Medicine includes as one of the six major "aims" of the health care system.[v] AHRQ staff and the advisers and partners who contribute to production of the NHQR realize that this is an area still in early development.

Expanded Analysis of Trends

In this year's report, AHRQ and its Federal partners have concentrated on refining the discussion of trends to improve the NHQR's ability to summarize progress in improving health care quality made over the past 5 years. In the Highlights section of this report, as in past NHQRs, the average annual rate of change was calculated between the earliest and the most recent estimates for all core measures. Consistent with *Health,*

[v] The others are effectiveness, safety, timeliness, patient centeredness, and equity. The six aims are discussed in the 2001 Institute of Medicine report *Crossing the Quality Chasm: A New Health System for the 21st Century.*

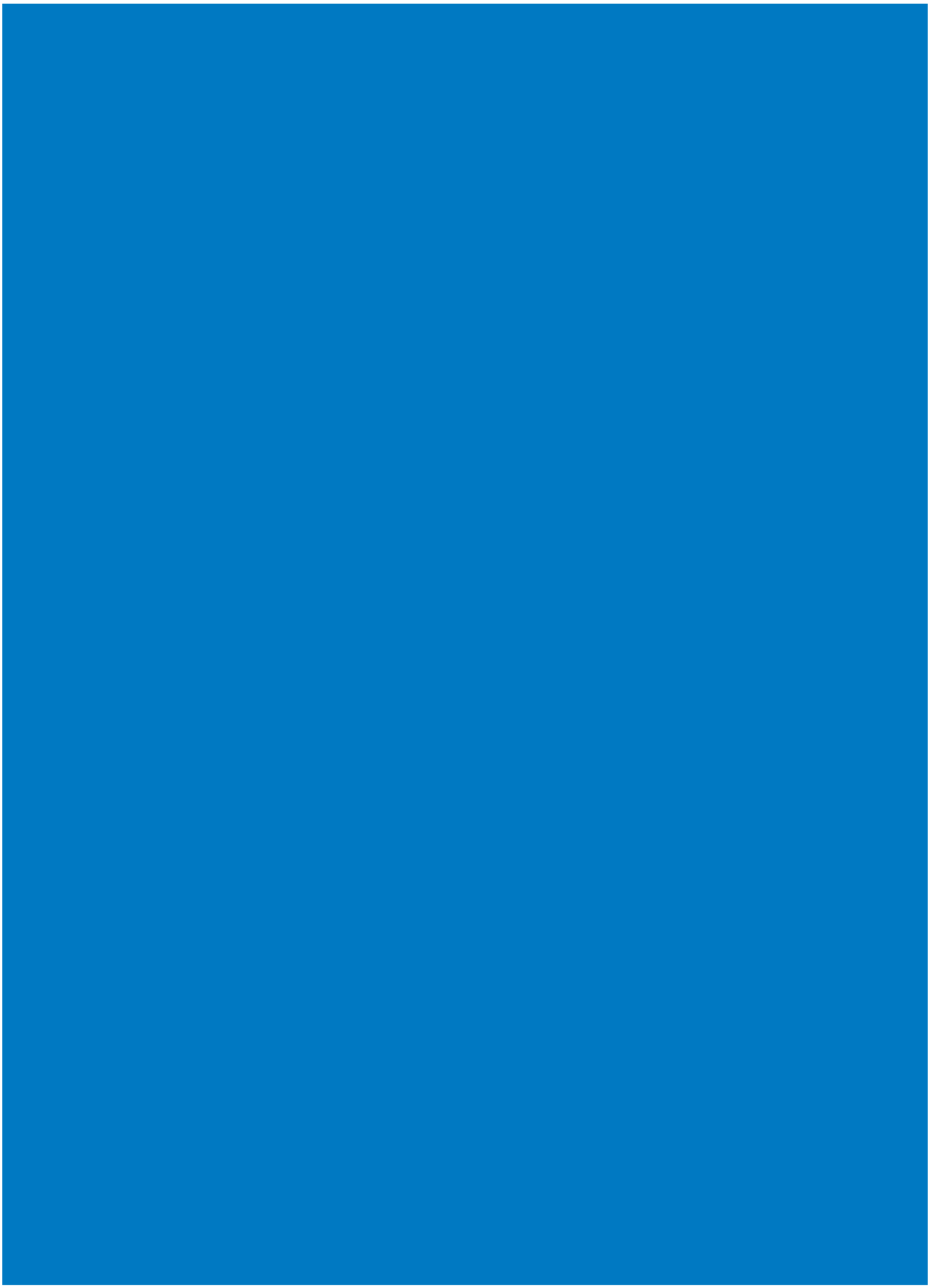
United States, a formula that produces the geometric rate of change is used for this calculation.[vi] In addition, AHRQ has analyzed the set of "core measures" for the report and attempted to obtain a common baseline data year and common comparison year to fix the trends analysis to a particular period of time. This approach differs from past reports, in which these analyses provided an annualized rate of change in quality across all the core report measures. (That rate was not linked to a particular period but was a generalized "rate of improvement.")

The primary reason for this addition is that the data sources for the NHQR are diverse, and each has particular years of data available. AHRQ has received feedback that its past trend analysis, although useful, is difficult to operationalize because the improvement rates are not fixed to particular points in time to permit analysis of particular policy initiatives. In addition to providing the general rate of change for measures that span the years 1994 (for a few measures) to 2005, this year's report therefore fixes the baseline analysis year as 2000-2001 and the comparison year as 2004-2005. In particular, an effort has been made to ensure that wherever trend data are available, a discussion is presented of whether performance has improved. Paired data years were used to allow the trend analysis to include the maximum number of core measures. The geometric rate of change, which assumes the same rate of change each year between the two time periods, has been calculated. In addition to the above changes made to improve the presentation of trends, two criteria are applied to determine whether a significant trend exists:

- First, the difference between the earliest and most recent estimates shown must be statistically significant with $p<0.05$.
- Second, the magnitude of average annual rate of change must be at least 1% per year.

Only changes over time that meet these two criteria are discussed in the 2007 reports, unless otherwise noted.

[vi] This calculation is consistent with those in *Health, United States*, published annually by the Centers for Disease Control and Prevention, National Center for Health Statistics.



Chapter 2. Effectiveness

As noted in Chapter 1, Introduction and Methods, effectiveness of care is presented under nine clinical condition/care setting areas: cancer; diabetes; end stage renal disease (ESRD); heart disease; HIV and AIDS; maternal and child health; mental health and substance abuse; respiratory diseases; and nursing home, home health, and hospice care. The nine individual sections of this chapter highlight a small number of core measures; results for all core measures are found in the List of Core Report Measures at the end of this report.

In this chapter, measures are organized into several categories related to the patient's need for preventive care, treatment of acute illness, and chronic disease management. These are derived from the original Institute of Medicine categories: staying healthy, getting better, living with illness or disability, and coping with the end of life. There is sizable overlap among these categories, and some measures may be considered to belong in more than one category. Outcome measures are particularly difficult to categorize when prevention, treatment, and management all play important roles. Nevertheless, for the purposes of this report, measures are placed into categories that best fit the general descriptions below.

Prevention

Caring for healthy people is an important component of health care. Educating people about health and promoting healthy behaviors can help postpone or avoid illness and disease. Additionally, detecting health problems at an early stage increases the chances of effectively treating them, often reducing suffering and expenditures.

Treatment

Even when preventive care is ideally implemented, it cannot entirely avert the need for acute care. Delivering optimal treatments for acute illness can help reduce the consequences of illness and promote the best recovery possible.

Management

Some diseases, such as diabetes and ESRD, are chronic, which means they cannot simply be treated once; they must be managed across a lifetime. Management of chronic disease often involves promotion and maintenance of lifestyle changes and regular contact with a provider to monitor the status of the disease. For patients, effective management of chronic diseases can mean the difference between normal, healthy living and frequent medical problems.

The measures highlighted on the following pages are categorized as follows:

Section	Measure
Prevention:	
Cancer	Breast cancer screening (mammography)
Cancer	Breast cancer first diagnosed at advanced stage
Cancer	Breast cancer mortality
Diabetes	Lower extremity amputations
Heart disease	Counseling smokers to quit smoking
Heart disease	Counseling obese adults about being overweight*
Heart disease	Counseling obese adults about exercise
HIV and AIDS	New AIDS cases
HIV and AIDS	HIV testing*
HIV and AIDS	Eligible AIDS patients receiving PCP and MAC prophylaxis*
Maternal and child health	Receipt of prenatal care in the first trimester
Maternal and child health	Receipt of all recommended immunizations by young children
Maternal and child health	Dental visits for children
Maternal and child health	Counseling for children about healthy eating
Maternal and child health	Children told by health provider they were overweight*
Mental health and substance abuse	Suicide deaths
Respiratory diseases	Pneumococcal vaccination
Treatment:	
Cancer	Receipt of recommended care for breast and colon cancer*
Heart disease	Receipt of recommended care for heart attack
Heart disease	Inpatient mortality following heart attack
Heart disease	Receipt of recommended care for acute heart failure
Maternal and child health	Hospital admissions for pediatric gastroenteritis
Mental health and substance abuse	Receipt of needed treatment for illicit drug use
Mental health and substance abuse	Receipt of treatment for depression
Respiratory diseases	Receipt of recommended care for pneumonia
Respiratory diseases	Receipt of antibiotics for the common cold
Respiratory diseases	Completion of tuberculosis therapy
Management:	
Diabetes	Receipt of three recommended diabetes services
Diabetes	Controlled hemoglobin, cholesterol, and blood pressure
Diabetes	State variation in retinal eye exams*
End stage renal disease	Adequacy of hemodialysis
End stage renal disease	Registration for transplantation
Respiratory diseases	Hospital admissions for pediatric asthma
Nursing home, home health, and hospice care	Use of restraints on long-stay nursing home residents
Nursing home, home health, and hospice care	Presence of pressure ulcers in nursing home residents

Nursing home, home health, and hospice care	Pain management for nursing home residents*
Nursing home, home health, and hospice care	Improvement in ambulation in home health episodes
Nursing home, home health, and hospice care	Acute care hospitalization of home health patients
Nursing home, home health, and hospice care	Receipt of right amount of pain medicine by hospice patients*
Nursing home, home health, and hospice care	Receipt of care consistent with patient's stated end-of-life wishes*

* Supplemental measure

Cancer

Importance and Measures

Mortality

Number of deaths (2007 est.) . . . . . 559,650[1]

Cause of death rank (2004) . . . . . 2nd[2]

Prevalence

Number of living Americans who have been diagnosed with cancer (2004 est.) . . . . . 10,762,214[3]

Incidence

New cases of cancer (2007 est.) . . . . . 1,444,920[1]

New cases of breast cancer in women (2007 est.) . . . . . 178,480[1]

Cost

Total cost[i] (2006) . . . . . $206.3 billion[4]

Direct costs[ii] (2006) . . . . . $78.2 billion[4]

Cost effectiveness[iii] of colorectal cancer screening . . . . . $0-$14,000/QALY[5]

Cost effectiveness of breast cancer screening . . . . . $35,000-$165,000/QALY[5]

Note: Statistics may vary from previous years due to revised and updated source statistics or addition of new data sources.

Measures

Evidence-based consensus defining good quality care and how to measure it currently exists for only a few cancers and a few aspects of care. Breast and colorectal cancers have high incidence rates and are highlighted in alternate years of the report. The 2006 NHQR highlighted colon cancer; this year's focus is on breast cancer. The core report measures are:

- Breast cancer screening (mammography).
- Breast cancer first diagnosed at an advanced stage.
- Breast cancer mortality.

[i] Total cost equals cost of medical care (direct cost) and economic costs of morbidity and mortality (indirect cost).

[ii] Direct costs are defined as "personal health care expenditures for hospital and nursing home care, drugs, home care, and physician and other professional services."[4]

[iii] Cost effectiveness is measured here by the average net cost of each quality adjusted life year (QALY) that is saved by the provision of a particular health intervention. QALYs are a measure of survival adjusted for its value: 1 year in perfect health is equal to 1.0 QALY, while a year in poor health would be something less than 1.0. A lower cost per QALY saved indicates a greater degree of cost effectiveness. For example, the net cost for colorectal cancer screening ranges from $0 to $14,000 for each QALY saved.

In addition, the 2007 NHQR includes three supplemental cancer care measures—two for breast cancer and one for colon cancer—from the National Cancer Data Base that have been endorsed by the National Quality Forum:

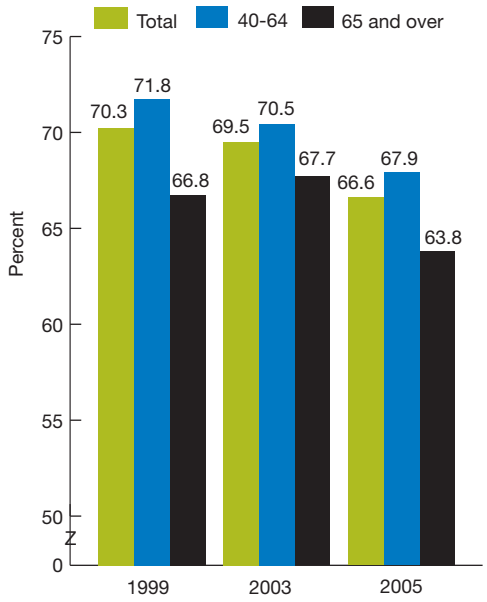
- Recommended care for breast and colon cancer patients:
    1. Administration of radiation therapy within 1 year of diagnosis for women under age 70 receiving breast-conserving surgery.
    2. Women with Stage I-IIb breast cancer who received either axillary node dissection or sentinel lymph node biopsy at the time of surgery (lumpectomy or mastectomy).
    3. Surgical resection of colon cancer that includes at least 12 lymph nodes.

Findings

Prevention: Breast Cancer Screening (Mammography)

Early detection of cancer increases treatment options and often improves outcomes. Mammography, the most effective method for detecting breast cancer at its early stages,[6] can identify malignancies before they can be felt and before symptoms develop. The U.S. Preventive Services Task Force recommends mammograms every 1-2 years for women age 40 and over.[7]

Figure 2.1. Women age 40 and over who reported they had a mammogram within the past 2 years, 1999, 2003, and 2005



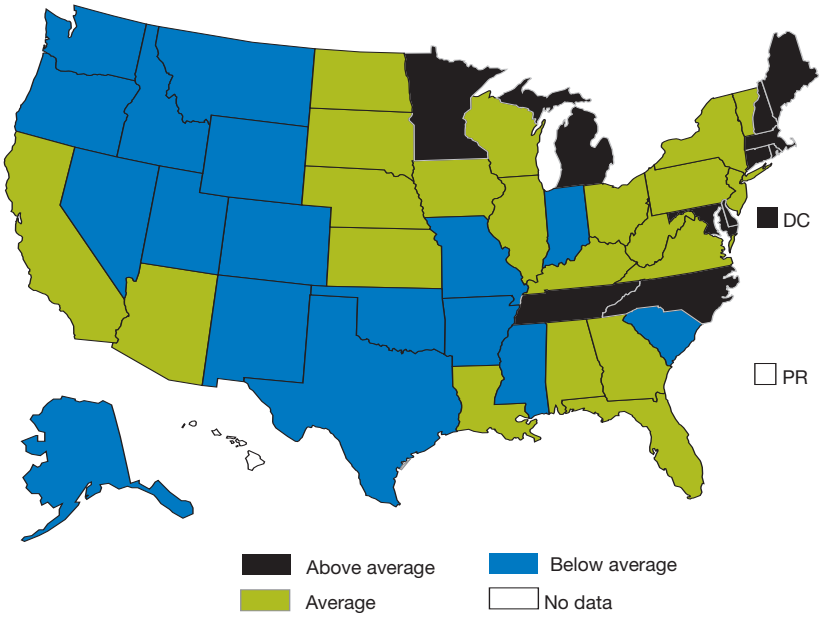
Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Health Interview Survey, 1999, 2003, and 2005.

Reference population: Civilian noninstitutionalized women age 40 and over.

Note: Total rate is adjusted to the 2000 U.S. standard population.

- Between 1999 and 2005, the proportion of women age 40 and over who reported that they had a mammogram in the past 2 years decreased overall by 3.7%; it also decreased for the subgroups of women ages 40-64 and age 65 and over (Figure 2.1).
- The decline in rates of mammography observed in 2005 based on the National Health Interview Survey (NHIS) is not entirely consistent with data available from other U.S. national and State data sources (e.g., the Medical Expenditure Panel Survey), which indicate more stable rates of mammography over the period 2000-2005. The apparent decline in mammography rates between 1999 and 2005 based on the NHIS is due at least in part to a change in the skip pattern for the 2005 NHIS mammography questions in order to obtain more accurate estimates.

Figure 2.2. State variation: Women age 40 and over who reported they had a mammogram within the past 2 years, 2004



Source: Centers for Disease Control and Prevention, National Center for Health Statistics, Behavioral Risk Factor Surveillance System, 2004.

Key: Above average = rate is significantly above the reporting States average in 2004. Below average = rate is significantly below the reporting States average in 2004.

Note: Age adjusted to the 2000 U.S. standard population. The "reporting States average" is the average of all reporting States (50 in this case, including the District of Columbia), which is a separate figure from the national average.

- Variation was seen among States in the rates of receipt of mammograms for women age 40 and over (Figure 2.2). In 2004, the reporting States average was 74.4%, ranging from 63.6% to 82.6%.
- Twelve States[iv] were significantly above the reporting States average in 2004, with a combined average rate of 80.3%.
- Seventeen States[v] were significantly below the reporting States average in 2004, with a combined average rate of 68.6%.

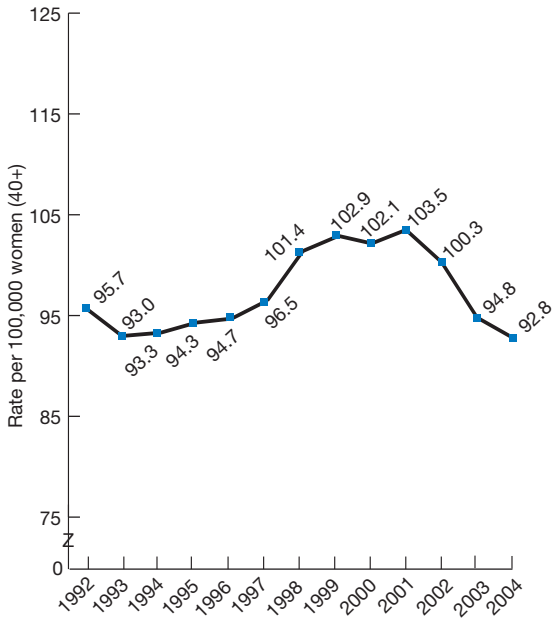
[iv] The States are Connecticut, Delaware, District of Columbia, Maine, Maryland, Massachusetts, Michigan, Minnesota, New Hampshire, North Carolina, Rhode Island, and Tennessee.

[v] The States are Alaska, Arkansas, Colorado, Idaho, Indiana, Mississippi, Missouri, Montana, Nevada, New Mexico, Oklahoma, Oregon, South Carolina, Texas, Utah, Washington, and Wyoming.

Prevention: Advanced Stage Breast Cancer

Cancers can be diagnosed at different stages of development. Cancers diagnosed early before spread has occurred are generally more amenable to treatment and cure; cancers diagnosed late with extensive spread often have poor prognoses. The rate of cases of cancer that are diagnosed at late or advanced stages is a measure of the effectiveness of cancer screening efforts and of followup care after a positive screening test.

Figure 2.3. Age-adjusted rate of late stage[a] breast cancer per 100,000 women age 40 and over, 1992-2004



[a] Regional, distant stage, or local stage with tumor greater than 2-cm diameter.

Source: National Cancer Institute, Surveillance, Epidemiology, and End Results Program, 1992-2004.

Reference population: Women age 40 and over.

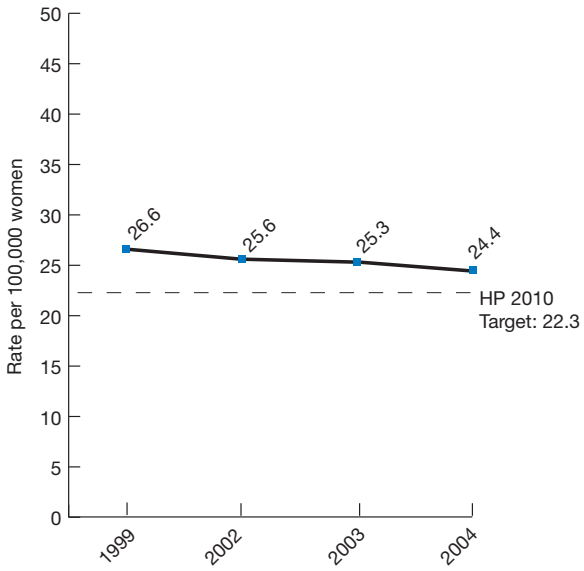
Note: Age adjusted to the 2000 U.S. standard population.

- Between 1992 and 2004, the overall rate of late stage breast cancer in women age 40 and over decreased from 95.7 to 92.8 per 100,000 women (Figure 2.3). This change was not statistically significant. However, both the increase in late stage disease observed between 1992 and the peak in 2001 (103.5 per 100,000), as well as the subsequent decrease (improvement) between 2001 and 2004, were statistically significant.

Prevention: Breast Cancer Mortality

The death rate from a disease is a function of many determinants, including the causes of the disease, social forces, and how well the health care system performs in providing effective prevention, treatment, and management of the disease. Breast cancer mortality reflects the impact of breast cancer screening, diagnosis, and treatment and is measured as the number of deaths per 100,000 women. Declines in breast cancer mortality can be attributed, in part, to improvements in early detection and treatment.

Figure 2.4. Age-adjusted breast cancer deaths per 100,000 women per year, all ages, 1999-2004



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

Reference population: U.S. population, women.

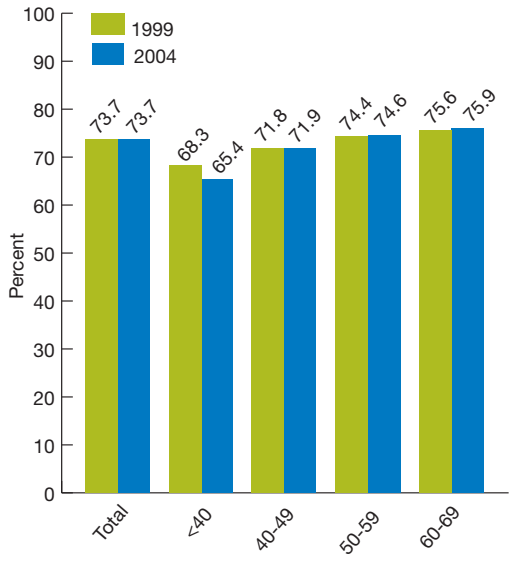
Note: Age adjusted to the 2000 U.S. standard population.

- Between 1999 and 2004, the rate of breast cancer deaths decreased from 26.6 to 24.4 per 100,000 female population (Figure 2.4).
- At 24.4 deaths per 100,000 females, the overall breast cancer death rate in 2004 was higher than the Healthy People 2010 target of 22.3. At the present rate of change, this target could be met by 2010.

Treatment: Recommended Care for Breast and Colon Cancer Patients

Different diagnostic and treatment options exist for various types of cancer. Some aspects of cancer care are well established as beneficial and are commonly recommended. The appropriateness of recommended care depends on different factors, such as the stage or the extent of the cancer within the body (especially whether the disease has spread from the original site to other parts of the body). Other types of care are important for accurate diagnosis, such as ensuring the adequate examination of lymph nodes when surgery is performed (e.g., to remove colon cancer).

Figure 2.5. Patients with breast cancer[a] who received recommended care: Radiation therapy to the breast within 1 year of diagnosis for women under age 70 receiving breast-conserving surgery, 1999 and 2004



[a] American Joint Committee on Cancer Stage I, II, or III, primary invasive epithelial breast cancer.

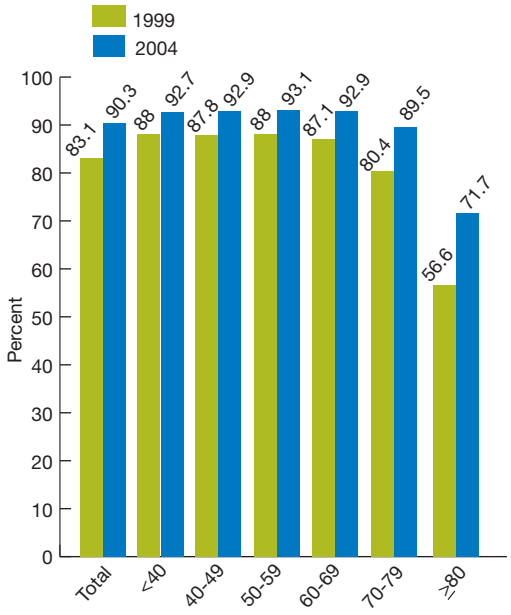
Source: American Cancer Society and American College of Surgeons, National Cancer Data Base, 1999 and 2004.

Reference population: U.S. population, women.

Note: Age adjusted to the 2000 U.S. standard population.

- Between 1999 and 2004, the rates of women under age 70 with breast cancer and receiving breast-conserving surgery who received the recommended treatment of radiation therapy to the breast within 1 year of diagnosis remained stable overall at 73.7%. It also remained stable for all age groups except women under 40, for whom the rate decreased from 68.3% in 1999 to 65.4% in 2004 (Figure 2.5).
- In both 1999 and 2004, the rates of radiation therapy were highest for women ages 60-69 (75.6% and 75.9%) and lowest for women under 40 (68.3% and 65.4%).

Figure 2.6. Patients with breast cancer who received recommended care: Axillary node dissection or sentinel lymph node biopsy at the time of surgery (lumpectomy or mastectomy) for women with Stage I-IIb breast cancer, 1999 and 2004



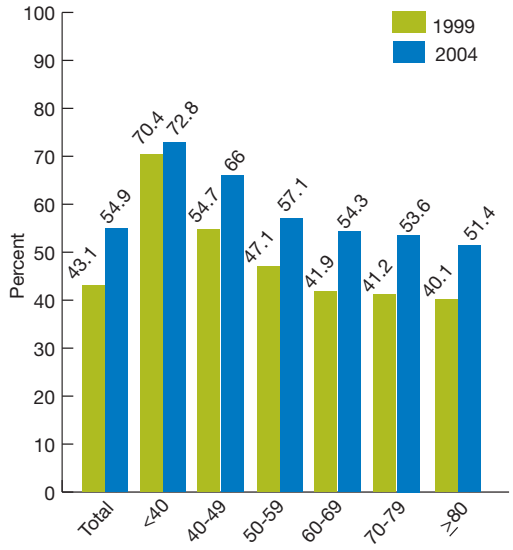
Source: American Cancer Society and American College of Surgeons, National Cancer Data Base, 1999 and 2004.

Reference population: U.S. population, women.

Note: Age adjusted to the 2000 U.S. standard population.

- Between 1999 and 2004, rates of patients with breast cancer who received recommended care of axillary node dissection or sentinel lymph node biopsy at the time of surgery (lumpectomy or mastectomy) for women with Stage I-IIb breast cancer increased overall (83.1% in 1999 to 90.3% in 2004), as well as for all age groups (Figure 2.6).
- In 2004, women ages 50-59 had the highest rate of receipt of this care for breast cancer (93.1%). Women 80 years and over had the lowest rates in both data years but also showed the highest relative increase from 1999 to 2004 (56.6% to 71.7%).

Figure 2.7. Patients with colon cancer who received recommended care: Surgical resection of colon cancer that included at least 12 lymph nodes, 1999 and 2004



Source: American Cancer Society and American College of Surgeons, National Cancer Data Base, 1999 and 2004.

Reference population: U.S. population.

Note: Age adjusted to the 2000 U.S. standard population.

- Between 1999 and 2004, rates of patients with colon cancer who received the recommended care, in which the surgical resection of colon cancer includes at least 12 lymph nodes, increased overall (from 43.1% in 1999 to 54.9% in 2004), as well as for each age group (Figure 2.7).
- In 1999 and in 2004, patients under age 40 had the highest rates of receipt of this care (70.4% and 72.8%), and patients age 80 and over had the lowest rates (40.1% and 51.4%).
- For patients with colon cancer, the median number of regional lymph nodes examined in resected colon specimens was 12 overall. Patients under age 40 had the highest (18) and patients age 70 and over had the lowest (12) median number of regional lymph nodes examined (data not shown).

Diabetes

Importance and Measures

Mortality

Number of deaths (2004) . . . . . 72,815[2]

Cause of death rank (2004) . . . . . 6th[2]

Prevalence

Total number of Americans with diabetes (2005) . . . . . 20,800,000[8]

Number of Americans diagnosed with diabetes (2005) . . . . . 14,600,000[8]

Number of Americans with undiagnosed diabetes (2005) . . . . . 6,200,000[8]

Incidence

New cases (age 20 and over, 2005) . . . . . 1,500,000[8]

Cost

Total cost (2002) . . . . . $132 billion[9]

Direct medical costs (2002) . . . . . $92 billion[9]

Note: Statistics may vary from previous years due to revised and updated source statistics or addition of new data sources.

Measures

Effective management of diabetes includes appropriate receipt of recommended processes, such as hemoglobin A1c tests, eye exams, and foot exams, as well as outcome measures expected to correlate positively with these processes, such as control of cholesterol, blood pressure, and HbA1c[vi] levels. In addition, hospital admission rates among patients with diabetes for amputations of a leg or foot can be an indicator of appropriate care for this condition.

The three core report measures highlighted in this section are:

- Receipt of three recommended diabetes services.
- Lower extremity amputations.
- Controlled hemoglobin, cholesterol, and blood pressure.

In addition, a supplemental measure is presented:

- State variation in retinal eye exams.

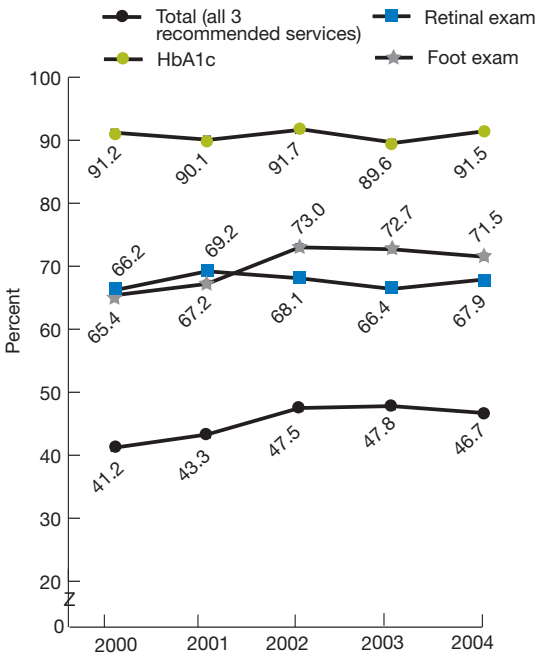
[vi] HbA1c is glycosylated hemoglobin—the higher the level of glucose in the blood, the higher the HbA1c level.

Findings

Management: Receipt of Three Recommended Diabetes Services

The NHQR uses a composite measure to track the national rate of the receipt of all three recommended diabetes interventions: an annual hemoglobin A1c test, an eye examination, and a foot examination. These provide an assessment of the management of diabetes and the presence of possible complications that can occur. They are basic process measures for the quality of care for diabetes. They do not include outcomes, such as the hemoglobin A1c value, an indicator of whether or not diabetes is adequately controlled.

Figure 2.8. Adults age 40 and over with diagnosed diabetes who received at least one HbA1c test, retinal exam, and foot exam in the past year, 2000-2004



Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2000-2004.

Reference population: Civilian noninstitutionalized population with diagnosed diabetes age 40 and over.

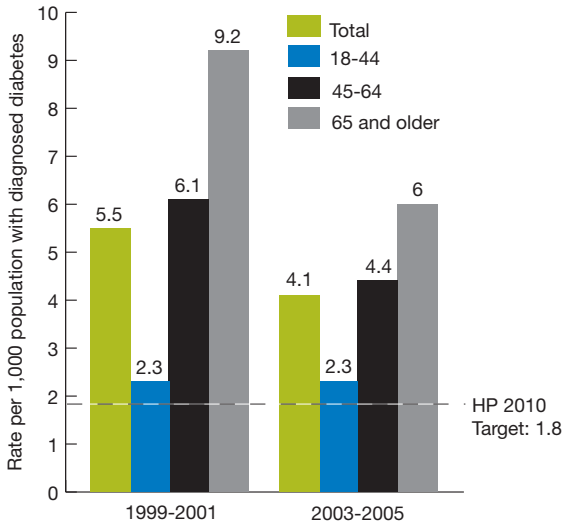
Note: Rates are age adjusted. Data include persons with both type 1 and type 2 diabetes.

- Of adults age 40 and over diagnosed with diabetes, 46.7% received an HbA1c test, a retinal exam, and a foot exam in 2004 compared with 41.2% in 2000. The rate was statistically unchanged between 2000 and 2004 (Figure 2.8).
- From 2000 to 2004, the rate of receipt of foot exams for adults age 40 and over diagnosed with diabetes increased from 65.4% to 71.5%, while the rates for HbA1c tests and retinal exams remained stable.

Prevention: Lower Extremity Amputations

Although diabetes is the leading cause of lower extremity amputations, amputations can be avoided through proper care on the part of patients and providers. Hospital admissions for lower extremity amputations for patients with diagnosed diabetes reflect poorly controlled diabetes. Better management of diabetes would prevent the need for lower extremity amputations.

Figure 2.9. Hospital admissions for lower extremity amputations per 1,000 adult patients with diagnosed diabetes, 1999-2001 and 2003-2005



Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Hospital Discharge Survey.

Reference population: Civilian noninstitutionalized adults age 18 and over with diagnosed diabetes, from the National Health Interview Survey, 1999-2001 and 2003-2005.

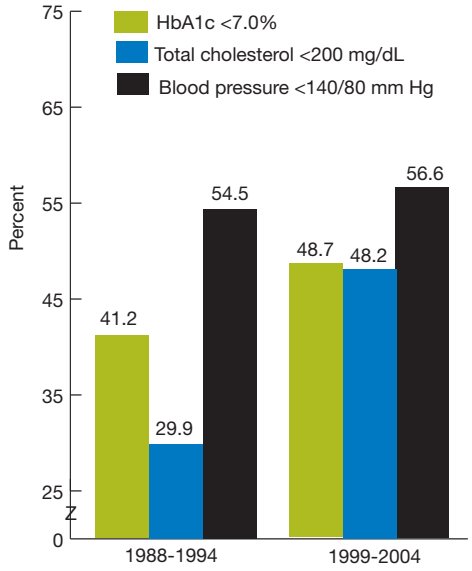
Note: Total rate is age adjusted to the 2000 U.S. standard population.

- The overall rate of lower extremity amputations in adults with diagnosed diabetes fell from 5.5 per 1,000 population in 1999-2001 to 4.1 per 1,000 population in 2003-2005 (Figure 2.9).
- During the same period, lower extremity amputation rates fell from 6.1 to 4.4 per 1,000 population for adults ages 45-64 and from 9.2 to 6.0 per 1,000 population for adults age 65 and over.
- The Healthy People 2010 target rate of 1.8 lower extremity amputations in adults with diagnosed diabetes per 1,000 population has not been met by any age group or by the total population age 18 and over.

Management: Controlled Hemoglobin, Cholesterol, and Blood Pressure

Persons diagnosed with diabetes[vii] are often at higher risk for other cardiovascular risk factors, such as high blood pressure and high cholesterol. Having these conditions in combination with diagnosed diabetes increases the likelihood of complications, such as heart and kidney diseases, blindness, nerve damage, and stroke. Patients who manage their diagnosed diabetes and maintain an HbA1c level of <7%, total cholesterol of <200 mg/dL, and blood pressure of <140/80 mm Hg[viii] can decrease these risks.

Figure 2.10. Adults age 40 and over with diagnosed diabetes with HbA1c, total cholesterol, and blood pressure under control, 1988-1994 and 1999-2004



Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Health and Nutrition Examination Survey, 1988-1994 and 1999-2004.

Reference population: Civilian noninstitutionalized population with diagnosed diabetes age 40 and over.

Note: Age adjusted to the 2000 U.S. standard population. Survey respondents were classified as having diabetes only if they had a previous diagnosis of diabetes from a doctor other than during a period of pregnancy (i.e., gestational diabetes was excluded). This is determined by a "Yes" response to the question: "Other than during pregnancy, have you ever been told by a doctor or health professional that you have diabetes or sugar diabetes?"

- In 1999-2004, 48.7% of adults age 40 and over diagnosed with diabetes had their HbA1c level under optimal control (<7.0%) (Figure 2.10). This percentage is statistically unchanged from the 1988-1994 time period.
- In 1999-2004, 48.2% of those age 40 and over diagnosed with diabetes had their total cholesterol under control (<200 mg/dL). This is an improvement over the 1988-1994 rate of 29.9% for this measure.
- In 1999-2004, 56.6% of this population had their blood pressure under control (<140/80 mm Hg), which is not significantly different from the 1988-1994 time period.
- Despite some progress, however, less than 60% of all adults age 40 and over with diagnosed diabetes have their blood sugar, cholesterol, and blood pressure under optimal control.

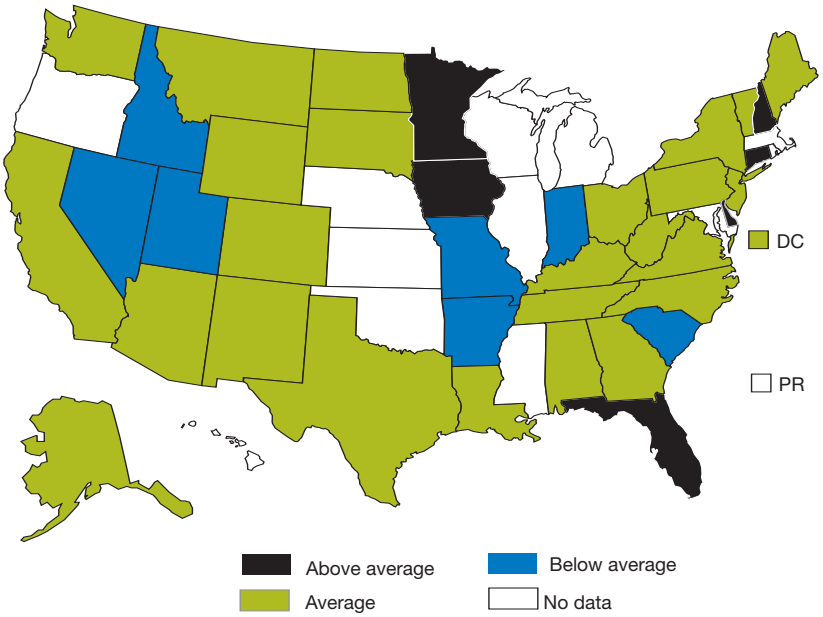
[vii] In 1997, the Expert Committee on the Diagnosis and Classification of Diabetes Mellitus issued revised guidelines for the diagnosis of diabetes. Included among these was a change of the threshold for fasting plasma glucose level for the diagnosis of diabetes, which was lowered from 140 mg per dL to 126 mg per dL.

[viii] Blood pressure control guidelines were updated in 2005. Previously, having a blood pressure reading of <140/90 mm Hg was considered under control. For this measure, the new threshold of <140/80 mm Hg has been applied to historical data for the sake of consistency and comparability.

Management: State Variation in Retinal Eye Exams

Because persons with diagnosed diabetes are at an increased risk of vision loss due to complications such as diabetic retinopathy, cataracts, and glaucoma, effective management of diabetes includes yearly retinal eye exams.

Figure 2.11. State variation: Rates of receipt of annual retinal eye exam among adults age 40 and over with diagnosed diabetes, by State, 2005



Source: Centers for Disease Control and Prevention, Behavioral Risk Factor Surveillance System, 2005.

Key: Above average = rate is significantly above the reporting States average in 2005. Below average = rate is significantly below the reporting States average in 2005.

Reference population: Civilian noninstitutionalized population age 40 and over.

Note: Age adjusted to the 2000 U.S. standard population. The "reporting States average" is the average of all reporting States (39 in this case, including the District of Columbia), which is a separate figure from the national average.

- In 2005, State rates of receipt of retinal eye exams by adults age 40 and over with diagnosed diabetes ranged from 51.0% to 78.9%, with a reporting States average of 69.3%.
- Six States[ix] were significantly above the reporting States average in 2005 (Figure 2.11), with a combined average rate of 77.9% in 2005.
- Seven States[x] were significantly below the reporting States average in 2005, with a combined average rate of 59.8%.

[ix] The States are Connecticut, Delaware, Florida, Iowa, Minnesota, and New Hampshire.

[x] The States are Arkansas, Idaho, Indiana, Missouri, Nevada, South Carolina, and Utah.

End Stage Renal Disease

Importance and Measures

Mortality

Total ESRD deaths (2004) . . . . . 84,252[10]

Prevalence

Total cases (2004) . . . . . 472,099[10]

Incidence

Number of new cases (2004) . . . . . 104,364[10]

Cost

Total ESRD Medicare program expenditures (2004) . . . . . $18.4 billion[10]

Note: Statistics may vary from previous years due to revised and updated source statistics or addition of new data sources.

Measures

The NHQR includes six measures of ESRD management to assess the quality of care provided to renal dialysis patients. The two core report measures highlighted here are:

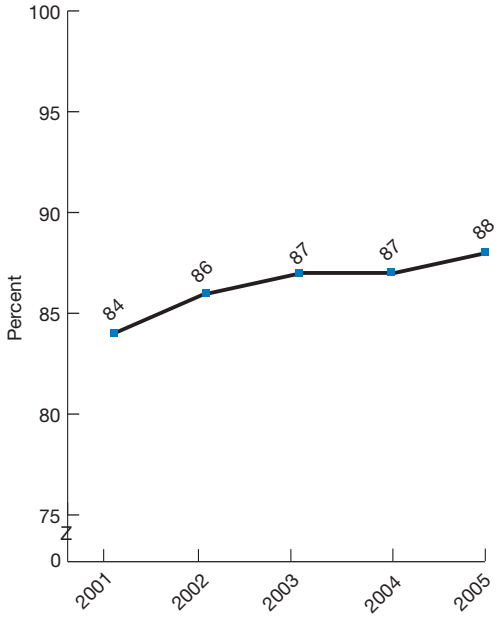
- Adequacy of hemodialysis.
- Registration for transplantation.

Findings

Management: Patients With Adequate Hemodialysis

Dialysis removes harmful waste and excess fluid buildup in the blood that occurs when kidneys fail to function. Hemodialysis is the most common method used to treat advanced and permanent kidney failure. The adequacy of dialysis is measured by the percentage of hemodialysis patients with a urea reduction ratio equal to or greater than 65%; this measure indicates how well urea, a waste product, is eliminated by the dialysis machine.

Figure 2.12. Medicare hemodialysis patients age 18 and over with adequate dialysis (urea reduction ratio 65% or higher), 2001-2005

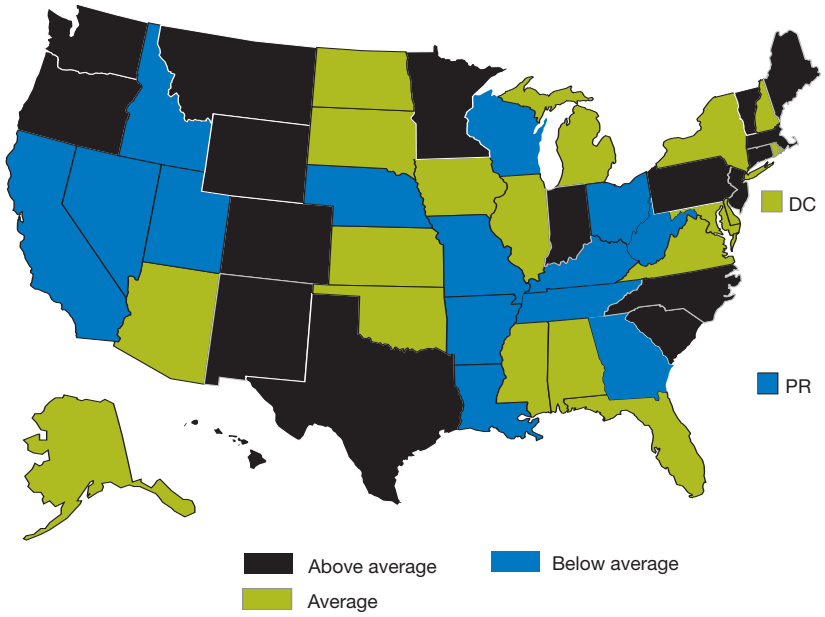


Source: Centers for Medicare & Medicaid Services, ESRD Clinical Performance Measures Project, 2001-2005.

Reference population: ESRD hemodialysis patients age 18 and over.

- Between 2001 and 2005, the percentage of all hemodialysis patients with adequate dialysis improved from 84% to 88% (Figure 2.12). The rates for each age group also improved over this period (data not shown).

Figure 2.13. State variation: Medicare hemodialysis patients with adequate dialysis (urea reduction ratio 65% or higher), 2005



Source: University of Michigan Kidney Epidemiology and Cost Center, 2005.

Key: Above average = rate is significantly above the reporting States average in 2005. Below average = rate is significantly below the reporting States average in 2005.

Reference population: ESRD hemodialysis patients and peritoneal dialysis patients.

Note: The "reporting States average" is the average of all reporting States (52 in this case, including the District of Columbia and Puerto Rico), which is a separate figure from the national average.

- In 2005, the reporting States average was 92.6%, ranging from 87.6% (Utah) to 96.9% (Hawaii).
- Eighteen States[xi] were significantly above the reporting States average in 2005 (Figure 2.13), with a combined average rate of 94.8%.
- Fifteen States[xii] were significantly below the reporting States average in 2005, with a combined average rate of 89.8%.
- Six States showed improvement on this measure from 2004 to 2005, while five States declined (data not shown).

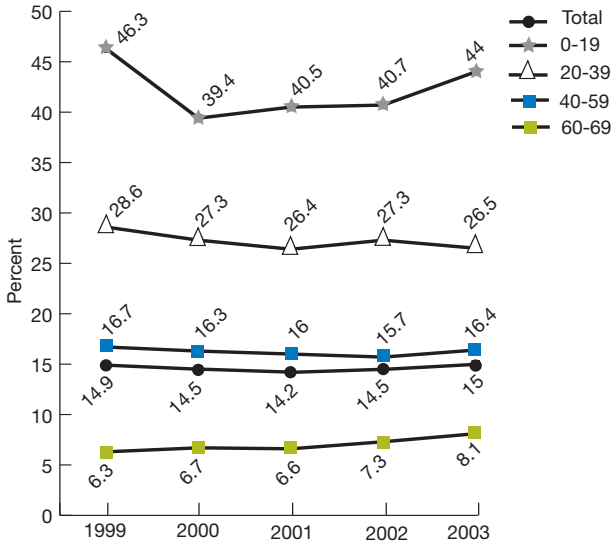
[xi] The States are Colorado, Connecticut, Hawaii, Indiana, Maine, Massachusetts, Minnesota, Montana, New Jersey, New Mexico, North Carolina, Oregon, Pennsylvania, South Carolina, Texas, Vermont, Washington, and Wyoming.

[xii] The States are Arkansas, California, Georgia, Idaho, Kentucky, Louisiana, Missouri, Nebraska, Nevada, Ohio, Puerto Rico, Tennessee, Utah, West Virginia, and Wisconsin.

Management: Registration for Transplantation

Kidney transplantation is a procedure that replaces a failing kidney with a healthy kidney. If a patient is deemed a good candidate for transplant, he or she is placed on the transplant program's waiting list. Dialysis patients wait for transplant centers to match them with the most suitable donor. Registration for transplantation is an initial step towards patients receiving the option of kidney transplantation. Early transplantation that decreases or eliminates the need for dialysis can also lessen the occurrence of acute rejection and patient mortality. In 2004, there were 60,393 patients on the Organ Procurement and Transplantation Network deceased donor kidney transplant waiting list in the United States, and only 10,228 deceased donor kidney transplants were performed.[10]

Figure 2.14. Medicare dialysis patients registered on waiting list for transplantation, by age group, 1999-2003



Source: U.S. Renal Data System, 1999-2003.

Reference population: ESRD hemodialysis patients and peritoneal dialysis patients under age 70.

Note: The 2003 estimates in this chart differ from those reported in the 2006 NHQR. The 2006 NHQR estimates for 2003 were preliminary data and have been updated.

- In 2003, 15.0% of dialysis patients were registered on a waiting list for transplantation. This rate did not improve from 1999 for the total population or for any age group (Figure 2.14).
- In all five data years, the likelihood of being on a transplantation waiting list decreased significantly with age.

Heart Disease

Importance and Measures

Mortality

Number of deaths (2004) . . . . . 654,092[2]

Cause of death rank (2004) . . . . . 1st[2]

Prevalence

Number of cases of coronary heart disease (2005) . . . . . 14,088,000[11]

Number of cases of heart failure (2004) . . . . . 5,200,000[11]

Number of cases of high blood pressure (2005) . . . . . 48,759,000[11]

Number of heart attacks (2004) . . . . . 7,900,000[11]

Incidence

Number of new cases of congestive heart failure (2004) . . . . . 550,000[11]

Cost

Total cost of cardiovascular disease (2006 est.) . . . . . $403.0 billion[4]

Total cost of congestive heart failure (2006 est.) . . . . . $29.6 billion[11]

Direct medical costs of cardiovascular disease (2006 est.) . . . . . $257.6 billion[4]

Cost effectiveness of hypertension screening . . . . . $14,000-$35,000/QALY[5]

Note: Statistics may vary from previous years due to revised and updated source statistics or addition of new data sources.

Measures

The NHQR tracks several quality measures for preventing and treating heart disease, including the following six core report measures:

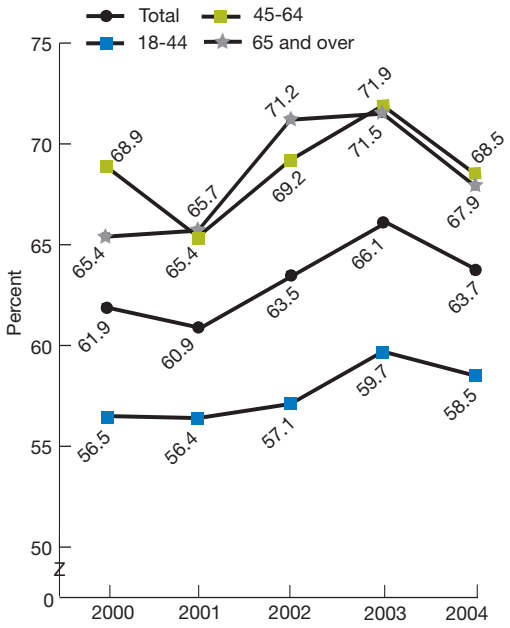
- Counseling smokers to quit smoking.
- Counseling obese adults about being overweight.
- Counseling obese adults about exercise.
- Receipt of recommended care for heart attack (acute myocardial infarction).
- Inpatient mortality following heart attack.
- Receipt of recommended care for acute heart failure.

Findings

Prevention: Counseling Smokers To Quit Smoking

Smoking may be the single most important modifiable risk factor for heart disease, and providers can encourage patients to quit smoking.

Figure 2.15. Current smokers age 18 and over with a routine office visit who reported receiving advice to quit smoking, 2000-2004



Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2000-2004.

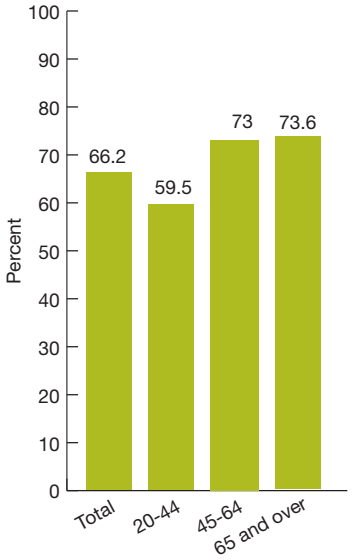
Reference population: Civilian noninstitutionalized population age 18 and over.

- In 2004, 63.7% of smokers with routine office visits during the preceding year reported that their providers had advised them to quit, an increase from 61.9% in 2000. This rate remained statistically unchanged for every age group during this time period (Figure 2.15).
- In all five data years, smokers ages 18-44 were less likely than the other age groups to receive advice to quit smoking.

Prevention: Counseling Obese Adults About Overweight

More than 32% of adults age 20 and over in the United States are obese (defined as having a body mass index of 30 or higher),[12] putting them at increased risk for many chronic, often deadly conditions, such as hypertension, cancer, diabetes, and coronary heart disease.[13] Although physician guidelines recommend that health care providers screen all adult patients for obesity,[14] obesity remains underdiagnosed among U.S. adults.[15]

Figure 2.16. Obese adults age 20 and over who were told by a doctor or health professional that they were overweight, 1999-2004



Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Health and Nutrition Examination Survey, 1999-2004.

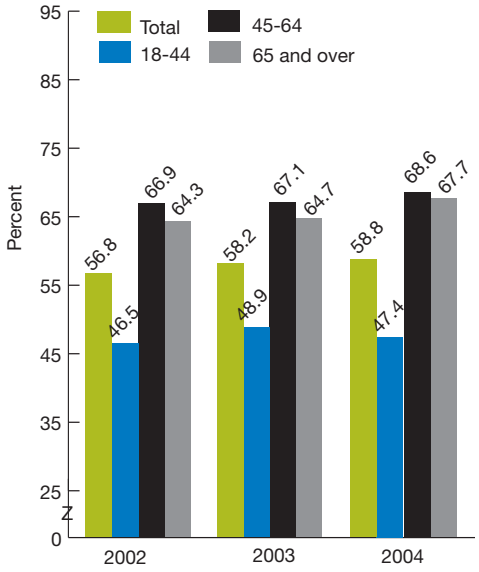
Reference population: Civilian noninstitutionalized adults age 20 and over.

- In 1999-2004, 66.2% of obese adults were told they were overweight by a doctor or health professional (Figure 2.16).
- During the time period 1999-2004, obese adults ages 45-64 (73.0%) and age 65 and over (73.6%) were more likely than those ages 20-44 (59.5%) to be told by a doctor or health professional that they were overweight.

Prevention: Counseling Obese Adults About Exercise

Physician-based exercise counseling is an important component of effective weight loss interventions,[14] and it has been shown to produce increased levels of physical activity among sedentary patients.[16] Regular exercise aids in weight loss and blood pressure control efforts, reducing the risk of heart disease, stroke, diabetes, and other comorbidities of obesity.

Figure 2.17. Obese adults age 18 and over who were given advice about exercise, 2002-2004



Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2002-2004.

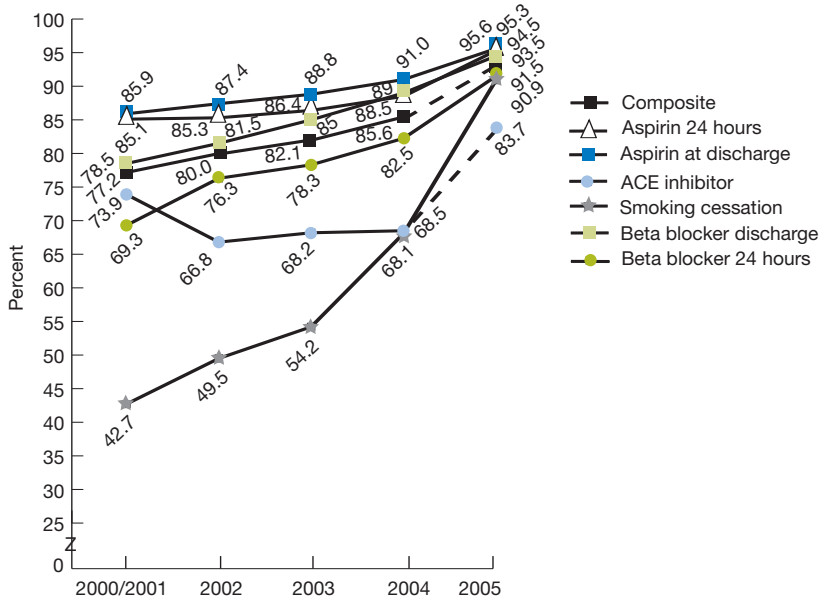
Reference population: Civilian noninstitutionalized adults age 18 and over.

- In 2004, 58.8% of obese adults were given advice about exercising. This figure did not improve from 2002, nor did it improve for any population subgroup (Figure 2.17).
- In all three years, obese adults ages 45-64 and 65 and over were more likely to receive advice about exercise than those ages 18-44.

Treatment: Receipt of Recommended Care for Heart Attack

There is consensus that recommended care for patients with a heart attack includes administration of aspirin within 24 hours of heart attack and at discharge, administration of beta blocker within 24 hours of attack and at discharge, angiotensin-II converting enzyme (ACE) inhibitor or angiotensin receptor blocker treatment among patients with left ventricular systolic dysfunction, and counseling to quit smoking among smokers. The NHQR reports on these measures, as well as a composite of these measures that addresses the proportion of all opportunities in which heart attack patients receive recommended care.

Figure 2.18. Receipt of recommended care for heart attack among patients age 18 and over: Overall composite and six components, 2000-2001, 2002, 2003, 2004, and 2005



Source: Centers for Medicare & Medicaid Services, Medicare Quality Improvement Organization Program, 2000-2001, 2002, 2003, 2004, and 2005.

Key: ACE=angiotensin converting enzyme; ARB=angiotensin receptor blocker.

Denominator: Patients hospitalized with a principal diagnosis of acute myocardial infarction.

Note: Beginning in 2005, the data collection method changed from the abstraction of randomly selected medical records for Medicare beneficiaries to the receipt of hospital self-reported data for all payer types. The ACE inhibitor measure was changed in 2005 to also include angiotensin receptor blockers as an acceptable alternative to ACE inhibitors.

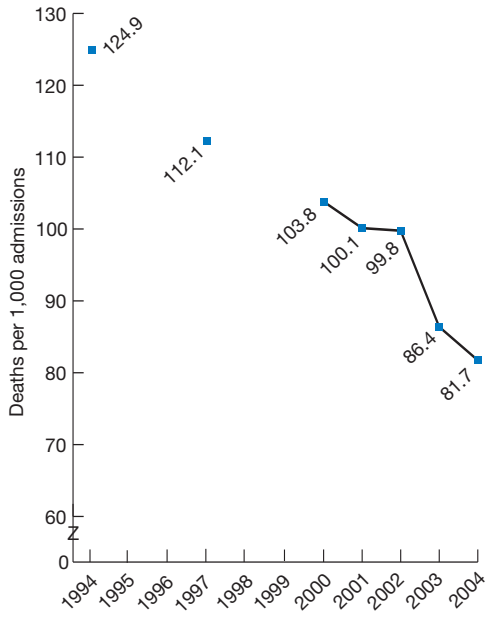
- The overall heart attack composite shows improvement in the provision of recommended care for Medicare patients with heart attacks from 77.2% of the opportunities to provide recommended care in 2000-2001 to 93.5% in 2005 (Figure 2.18).
- All six of the component measures showed improvement, including aspirin within 24 hours of admission (from 85.1% to 95.3%), aspirin at discharge (from 85.9% to 95.6%), counseling for smoking cessation (from 42.7% to 90.9%), beta blocker within 24 hours of admission (from 69.3% to 91.5%), and beta blocker at discharge (from 78.5% to 94.5%).

- Overall, from 2000-2001 to 2005, ACE inhibitor use improved from 73.9% to 83.7%. An apparent decline occurred between 2000-2001 and 2002. It should be noted that, in 2005, this measure was refined to also include angiotensin receptor blockers as an acceptable alternative to ACE inhibitors.
- It should also be noted that the data collection method changed between 2004 and 2005 from the abstraction of randomly selected medical records for Medicare beneficiaries to the receipt of hospital self-reported data for all payer types. This change could contribute to the change in the estimates for these measures over the period 2004 to 2005.

Treatment: Inpatient Mortality Following Heart Attack

Survival following admission for a heart attack reflects multiple patient factors, such as a patient's comorbidities, as well as health care system factors, such as the possible need to transfer hospitals in order to receive services. Also, it may partly reflect receipt of appropriate health services.

Figure 2.19. Deaths per 1,000 admissions with a heart attack as principal discharge diagnosis among persons age 18 and over, 1994, 1997, and 2000-2004



Source: Agency for Healthcare Research and Quality, Healthcare Cost and Utilization Project Nationwide Inpatient Sample, 1994, 1997, 2000-2004.

Denominator: Any person age 18 and over, U.S. citizen or foreign, using non-Federal, community hospitals in the United States, with a heart attack as principal discharge diagnosis.

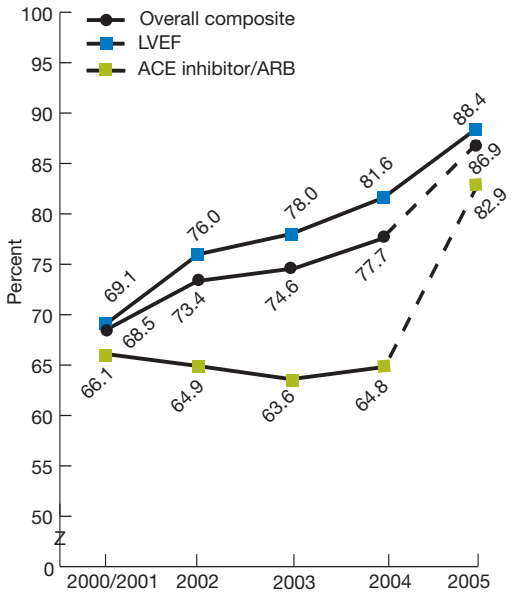
Note: Rates are adjusted by age, gender, age-gender interactions, and all-payer refined diagnosis-related groups scoring of risk of mortality. Data were analyzed for two selected historical years (1994 and 1997) and annually with each NHQR (2000-2004).

- Between 1994 and 2004, the overall inpatient mortality rate declined from 124.9 to 81.7 deaths per 1,000 admissions with heart attack (Figure 2.19).

Treatment: Receipt of Recommended Care for Acute Heart Failure

The NHQR tracks the national rates of the receipt of a recommended test for heart functioning (heart failure patients having evaluation of left ventricular ejection fraction [LVEF]), for recommended medication treatment (patients with left ventricular dysfunction prescribed ACE inhibitor or angiotensin receptor blocker at discharge), and an overall composite measure that describes the proportion of all episodes in which heart failure patients receive recommended care.

Figure 2.20. Receipt of recommended care for acute heart failure among patients: Overall composite and two components, 2000-2001, 2002, 2003, 2004, and 2005



Source: Centers for Medicare & Medicaid Services, Medicare Quality Improvement Organization Program, 2000-2001, 2002, 2003, 2004, and 2005.

Key: LVEF=left ventricular ejection fraction; ACE=angiotensin-II converting enzyme; ARB=angiotensin receptor blocker.

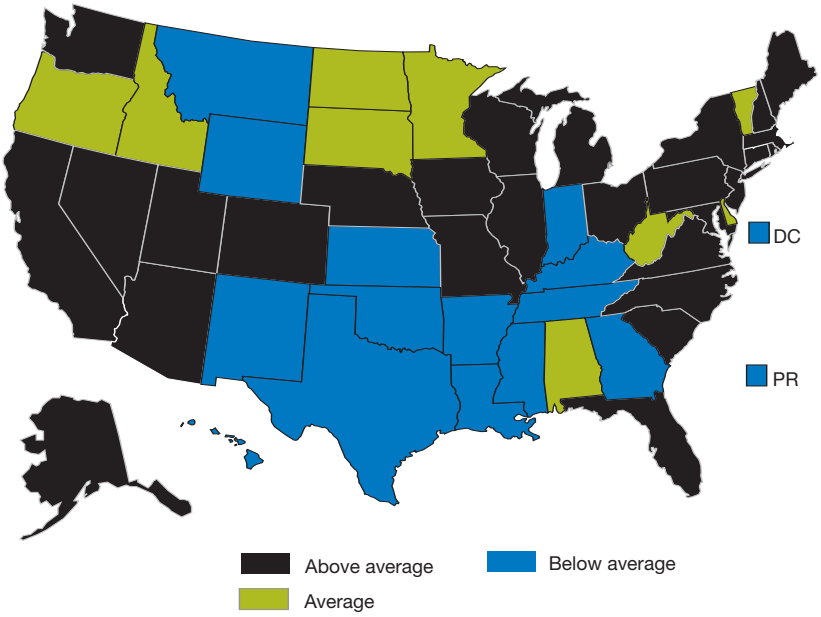
Denominator: Patients hospitalized with a principal diagnosis of acute heart failure.

Note: Beginning in 2005, the data collection method changed from the abstraction of randomly selected medical records for Medicare beneficiaries to the receipt of hospital self-reported data for all payer types. The ACE inhibitor measure was changed in 2005 to also include ARBs as an acceptable alternative to ACE inhibitors.

- The overall heart failure composite showed improvement in the provision of recommended care for Medicare patients with heart failure from 68.5% of the opportunities to provide recommended care in 2000-2001 to 86.9% in 2005 (Figure 2.20).
- The LVEF measure showed improvement from 69.1% in 2000-2001 to 88.4% in 2005.
- The use of ACE inhibitors for treatment of acute heart failure for patients with left ventricular dysfunction remained stable between 2000-2001 and 2004; however, the value for this measure increased between 2004 and 2005 when the measure was changed to also include angiotensin receptor blockers as an acceptable alternative to ACE inhibitors.

- It should be noted that the data collection method changed between 2004 and 2005 from the abstraction of randomly selected medical records for Medicare beneficiaries to the receipt of hospital self-reported data for all payer types. This change could contribute to the change in the estimates for these measures over the period 2004 to 2005.

Figure 2.21. State variation: Receipt of recommended hospital care for acute heart failure, 2005



Source: Centers for Medicare & Medicaid Services, Medicare Quality Improvement Organization Program, 2005.

Key: Above average = rate is significantly above the reporting States average in 2005. Below average = rate is significantly below the reporting States average in 2005.

Denominator: Patients hospitalized with a principal diagnosis of acute heart failure.

Note: The "reporting States average" is the average of all reporting States (52 in this case, including the District of Columbia and Puerto Rico), which is a separate figure from the national average.

- In 2005, the reporting States average was 86.9%, with States ranging from a low of 68.8% to a high of 92.9%.
- Twenty-seven States[xiii] were significantly above the reporting States average in 2005 (Figure 2.21), with a combined average rate of 89.5%.
- Sixteen States[xiv] were significantly below the reporting States average in 2005, with a combined average rate of 82.4%.

[xiii] The States are Alaska, Arizona, California, Colorado, Connecticut, Florida, Illinois, Iowa, Maine, Maryland, Massachusetts, Michigan, Missouri, Nebraska, Nevada, New Hampshire, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Rhode Island, South Carolina, Utah, Virginia, Washington, and Wisconsin.

[xiv] The States are Arkansas, District of Columbia, Georgia, Hawaii, Indiana, Kansas, Kentucky, Louisiana, Mississippi, Montana, New Mexico, Oklahoma, Tennessee, Texas, Wyoming, and Puerto Rico.

HIV and AIDS

Importance and Measures

Mortality

Number of deaths among persons with AIDS (2005) . . . . . 17,011[17]

Prevalence

Number of persons in the United States living with HIV (2005) . . . . . 215,346[17]

Number of persons in the United States living with AIDS (2005) . . . . . 421,873[17]

Incidence

New AIDS cases (2005). . . . . 40,608[17]

Cost

Federal spending on HIV/AIDS care (2006). . . . . $17.9 billion[18]

Note: Statistics may vary from previous years due to revised and updated source statistics or addition of new data sources.

Measures

This section highlights one core report measure focusing on quality of preventive care for HIV-infected individuals:

- New AIDS cases.

In addition, four supplemental measures related to prevention are also presented: one measure on prevention of opportunistic infections in HIV patients from the HIV Research Network and three measures focusing on testing for HIV from the National Survey of Family Growth:

- Testing for HIV infection.[xv]
- Eligible AIDS patients receiving prophylaxis for *Pneumocystis* pneumonia (PCP) and *Mycobacterium avium* complex (MAC).

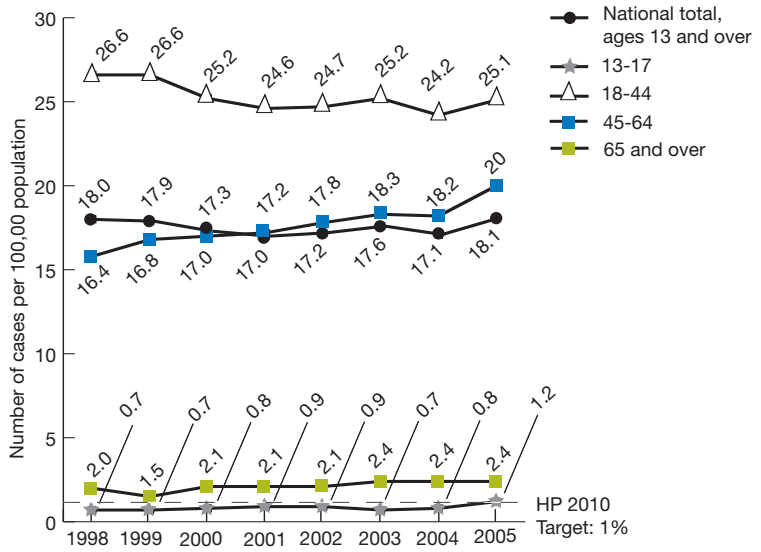
[xv] Includes the following three measures: (1) testing for HIV outside of blood donation; (2) women completing a pregnancy with an HIV test as part of prenatal care; and (3) people with any HIV risk behavior in the last 12 months who had an HIV test outside of blood donation.

Findings

Prevention: New AIDS Cases

Changes in HIV infection rates reflect changes in behavior by at-risk individuals that may only partly be influenced by the health care system. However, individual and community programs have shown progress in influencing behavior change. Changes in the incidence of new AIDS cases are affected by changes in HIV infection rates and by the availability of appropriate treatments for HIV-infected individuals. Improved treatments that extend life for those with the disease are reflected in the fact that the number of deaths due to AIDS fell from about 18,000 to 16,000 between 2003 and 2005, after showing no change for the previous three years.[17]

Figure 2.22. New AIDS cases per 100,000 population age 13 and over, 1998-2005



Source: Centers for Disease Control and Prevention, National Center for HIV, STD, and TB Prevention, HIV/AIDS Reporting System, 1998-2005.

Reference population: U.S. population age 13 and over.

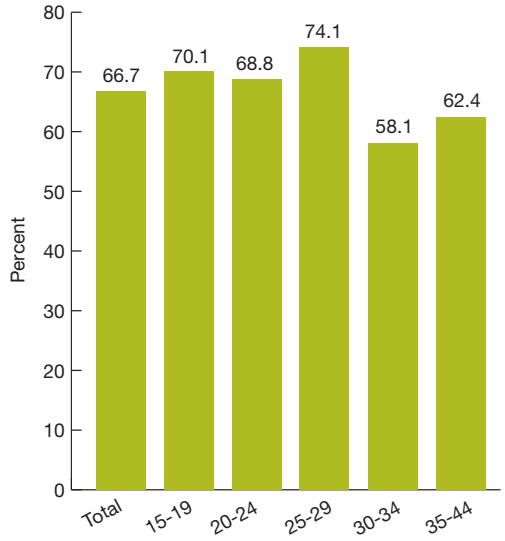
- The overall rate of new AIDS cases per 100,000 did not improve between 1998 and 2005. However, during that same time span, the rate of new AIDS cases decreased for adults ages 18-44 while increasing for children ages 13-17, adults ages 45-64, and adults age 65 and over (Figure 2.22).
- The 2005 national rate of 18.1 new AIDS cases per 100,000 persons is well above the Healthy People 2010 target of 1.0 new case per 100,000 persons. If current trends continue, the target will not be met.

Prevention: HIV Testing

Routine voluntary HIV testing is recommended by the Centers for Disease Control and Prevention as part of normal medical practice in all health care settings.[19] HIV infection is a serious health disorder that can be diagnosed before symptoms develop. HIV can be detected by reliable, inexpensive, and noninvasive screening tests. Although blood donations are routinely tested for HIV, it is important to track HIV testing in a health care setting to determine the impact of preventive care for the population. HIV-infected patients have years of life to gain if treatment is initiated early, before symptoms develop.

To normalize HIV testing as a routine part of medical care, in September 2006, the Centers for Disease Control and Prevention published revised recommendations that all patients ages 13-64 be tested on a voluntary basis. The revised recommendations also expanded the existing recommendations for screening pregnant women.

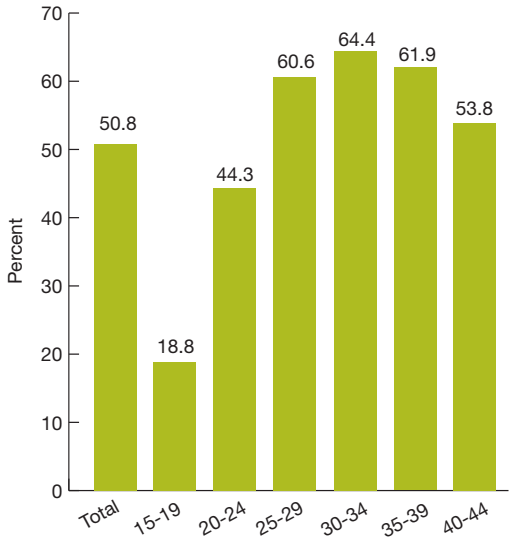
Figure 2.23. Women ages 15-44 who completed a pregnancy in the last 12 months and had an HIV test as part of prenatal care, by age group, 2002



Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Survey of Family Growth, 2002.

- In 2002, the proportion of pregnant women ages 15-44 who had an HIV test as part of prenatal care was 66.7% (Figure 2.23).
- Among pregnant women ages 15-44, the rate of HIV testing as part of prenatal care was highest for women ages 25-29 (74.1%) and lowest for women ages 30-34 (58.1%).

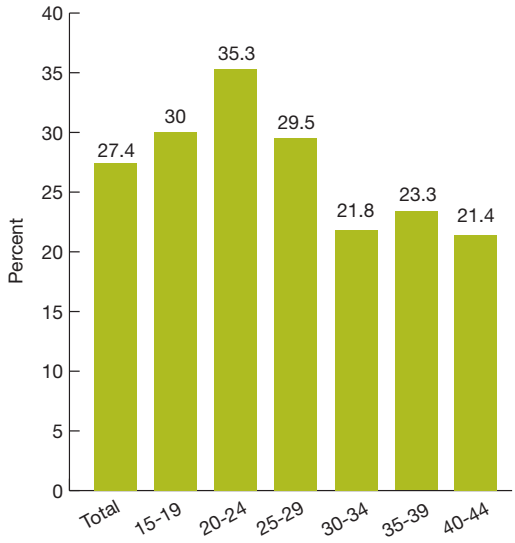
Figure 2.24. Persons ages 15-44 who ever had an HIV test outside of blood donation, by age group, 2002



Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Survey of Family Growth, 2002.

- In 2002, just over half of people ages 15-44 ever had an HIV test outside of blood donation (Figure 2.24).
- People ages 30-34 had the highest rate of HIV testing (64.4%) and those ages 15-19 had the lowest rate (18.8%).

Figure 2.25. Persons ages 15-44 with any HIV risk behaviors in the last 12 months who had an HIV test outside of blood donation in the last 12 months, 2002



Note: This table is based on a composite measure of HIV risk as defined by the Centers for Disease Control and Prevention in *Advance Data*.[20, 21] The statistics in this table represent 6.55 million women and 7.81 million men ages 15-44 who fulfilled the definition. A survey respondent (R) was included if she/he reported any of the following in the 12 months before interview: crack cocaine or illicit intravenous drug use, five or more opposite-sex sexual partners, any same-sex partners (if R is male), a partner with intravenous drug use, a male partner who has had sex with males (if R is female), an HIV-positive partner, sex exchanged for money or drugs, or treatment for sexually transmitted disease.

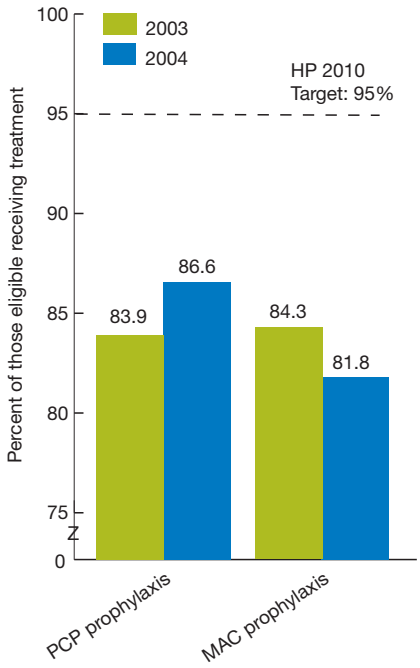
Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Survey of Family Growth, 2002.

- In 2002, 27.4% of people ages 15-44 with any HIV risk behaviors in the last 12 months had an HIV test outside of blood donation (Figure 2.25).
- Among people ages 15-44 with any HIV risk behaviors in the last 12 months, those ages 20-24 had the highest rate of HIV testing (35.3%). Those ages 40-44 had the lowest rate (21.4%).

Prevention: PCP and MAC Prophylaxis

Management of chronic HIV disease includes outpatient and inpatient services. Without adequate treatment, as HIV disease progresses, CD4 cell counts fall and patients become increasingly susceptible to opportunistic infections. When CD4 cell counts fall below 200, medicine to prevent development of PCP is routinely recommended; when CD4 cell counts fall below 50, medicine to prevent development of disseminated MAC infection is routinely recommended.[22] Because national data on HIV care are not routinely collected, HIV measures tracked in the NHQR come from the HIV Research Network, which consists of 18 medical practices across the United States that treat large numbers of HIV patients.[xvi]

Figure 2.26. Eligible AIDS patients age 18 and over receiving PCP and MAC prophylaxis, 2003 and 2004



Source: HIV Research Network, 2003 and 2004.

Key: PCP = *Pneumocystis* pneumonia; MAC = *Mycobacterium avium* complex.

Reference population: Adult patients with AIDS with CD4 cell counts below 200 (PCP) or CD4 cell counts below 50 (MAC).

Note: Data from the HIV Research Network are not nationally representative of the level of care received by all Americans living with HIV. Participation in this network is voluntary, and network data represent only patients who are actually receiving care. Furthermore, data shown above are not representative of the HIV Research Network as a whole because they represent only a subset of network sites that have the best quality data. (For more information on the HIV Research Network, see: www.ahrq.gov/data/hivnet.htm.)

- Of eligible patients (3,157 AIDS patients with at least two CD4 cell counts below 200), 86.6% received PCP prophylaxis in 2004 (Figure 2.26), which is a significant increase compared with 2003 but still below the Healthy People 2010 target of 95%.
- Of eligible patients (966 AIDS patients with at least two CD4 cell counts below 50), 81.8% received MAC prophylaxis in 2004, which is not significantly different from 2003 and is below the Healthy People 2010 target of 95%.

[xvi] Although program data are collected from all Ryan White HIV/AIDS Program grantees, the aggregate nature of the data makes it difficult to assess the quality of care provided by Ryan White HIV/AIDS Program providers.

Maternal and Child Health

Importance and Measures

Mortality

Number of maternal deaths (2004) . . . . . 540[23]

Number of infant deaths (2004) . . . . . 27,896[2]

Demographics

Number of children under 18 (2005) . . . . . 73,469,984[24]

Number of babies born in United States (2004) . . . . . 4,115,590[25]

Cost

Total cost of health care for children (2002) . . . . . $79 billion[26]

Cost effectiveness of vision screening for children . . . . . $0-$14,000[5]

Cost effectiveness of childhood immunization series[xvii] . . . . . cost saving[5]

Note: Statistics may vary from previous years due to revised and updated source statistics or addition of new data sources.

Measures

The NHQR tracks several prevention and treatment measures related to maternal and child health care throughout the report. The core report measures highlighted in this section are:

- Receipt of prenatal care in the first trimester.
- Receipt of all recommended immunizations by young children.
- Dental visits by children.
- Counseling parents about healthy eating in children.
- Hospital admissions for pediatric gastroenteritis.

In addition, one supplemental measure is presented:

- Weight monitoring of overweight[xviii] children.

[xvii] The childhood immunization series includes vaccinations for diphtheria-tetanus-pertussis; measles-mumps-rubella; inactivated polio virus; *Haemophilus influenzae* type B; hepatitis B; and varicella.

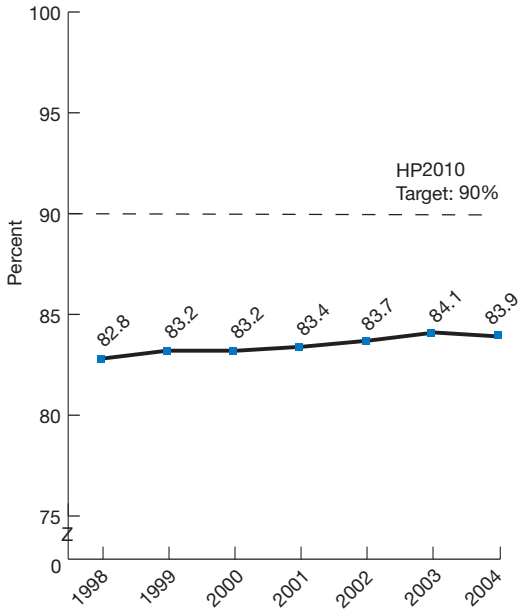
[xviii] Children and youth can be categorized as acceptable, underweight, at risk of overweight, or overweight. Children with body mass index values at or above the 95th percentile of the sex-specific body mass index growth charts are categorized as overweight.

Findings

Prevention: Prenatal Care in the First Trimester

Pregnant women are at risk for high blood pressure, gestational diabetes, and other disorders. Prenatal care is a preventive service intended to identify and manage risk factors in pregnant women and their unborn children in order to improve the chances of a healthy mother and child during pregnancy, birth, and early childhood. Prenatal care is recommended during the first trimester and throughout pregnancy.

Figure 2.27. Women of all ages delivering live births who received prenatal care in the first trimester of pregnancy, 1998-2004



Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Vital Statistics System - Natality, 1998-2004.

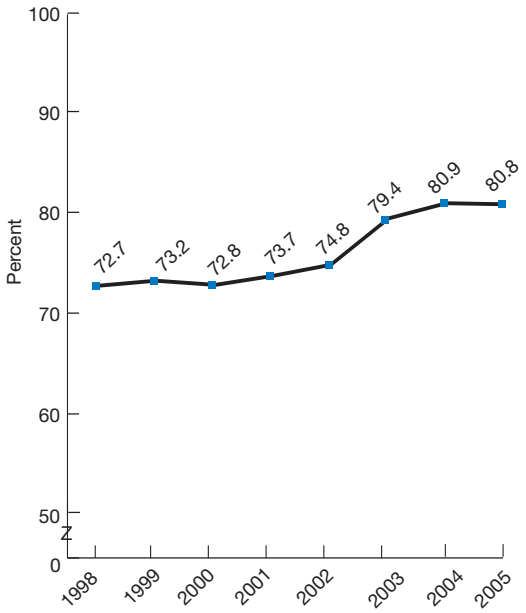
Reference population: Women with live births.

- The percentage of women who received prenatal care in the first trimester of pregnancy increased gradually from 82.8% in 1998 to 83.9% in 2004 (Figure 2.27).
- As of 2004, the percentage of women who received prenatal care in the first trimester of pregnancy had not yet achieved the Healthy People 2010 target of 90%. At the current average annual rate of change, this target is not projected to be met.

Prevention: Receipt of All Recommended Immunizations by Young Children

Immunizations are important for reducing mortality and morbidity. They protect recipients, as well as others in the community who cannot be vaccinated, from illness and disability. Recommended vaccines for children ages 19-35 months include four doses of diphtheria-tetanus-pertussis vaccine, three doses of polio vaccine, one dose of measles-mumps-rubella vaccine, three doses of *H. influenzae* type B vaccine, and three doses of hepatitis B vaccine.

Figure 2.28. Children ages 19-35 months who received all recommended vaccines, 1998-2005



Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Immunization Survey, 1998-2005.

Reference population: U.S. civilian noninstitutionalized population: children ages 19-35 months.

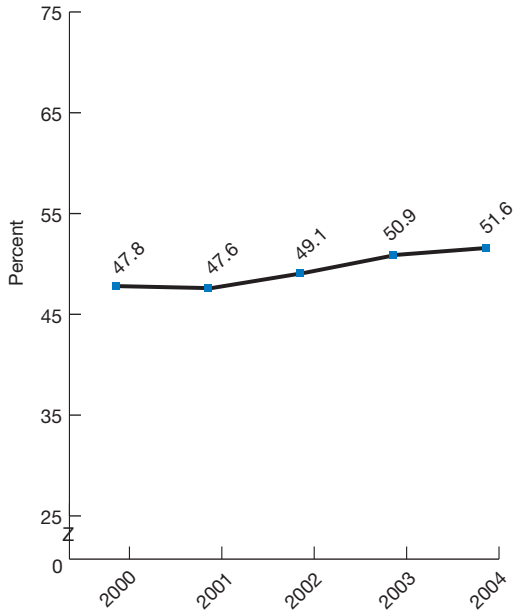
Note: The vaccines included in this measure are based on the corresponding Healthy People 2010 objective, which does not include varicella vaccine or vaccines added to the recommended schedule after 1998 for children up to 35 months of age. More information can be found in the Measure Specifications Appendix.

- From 1998 to 2005, the percentage of children ages 19-35 months who received all recommended vaccines increased from 72.7% to 80.8% (Figure 2.28).

Prevention: Children's Dental Care

According to the National Institute of Dental and Craniofacial Research, presence of dental caries is the single most common chronic disease of childhood, occurring five to eight times as frequently as asthma, the second most common chronic disease in children.[27] Regular dental visits help to improve overall oral health and prevent dental caries.

Figure 2.29. Children ages 2-17 with a dental visit in the past year, 2000-2004



Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2000-2004.

Reference population: U.S. civilian noninstitutionalized population: children ages 2-17.

Note: Rates are age adjusted. Dental visit is based on event data.

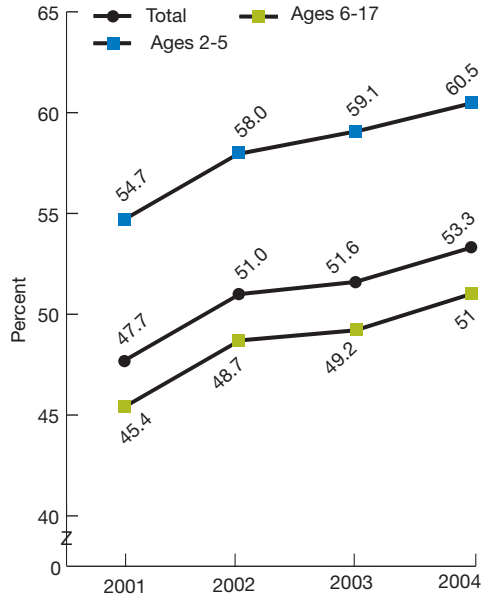
- The percentage of children ages 2-17 who visited a dentist in the past year improved from 47.8% in 2000 to 51.6% in 2004 (Figure 2.29).

Prevention: Counseling Parents About Healthy Eating in Children

Childhood represents a period when healthy, life-long habits of diet and exercise can be formed, and physicians play an important role in encouraging these healthy behaviors in children. Overweight and obesity during childhood often persist into adulthood, with consequences that are numerous and costly. Unfortunately, the prevalence of overweight and obesity among children has risen dramatically in recent decades.[28]

The American Academy of Pediatrics recommends that pediatricians discuss and promote healthy diets with their patients.[28]

Figure 2.30. Children ages 2-17 for whom a doctor or other health care provider ever gave advice about healthy eating, by age group, 2001-2004



Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2001-2004.

Reference population: U.S. civilian noninstitutionalized population: children ages 2-17.

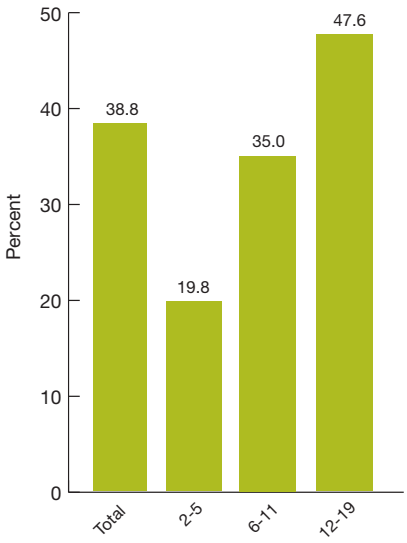
Note: Rates are age adjusted.

- Parents of only just over half of all children reported receiving advice on healthy eating. However, from 2001 to 2004, the proportion of children for whom a doctor or other health care provider ever gave advice about healthy eating improved from 47.7% to 53.3% (Figure 2.30).
- The proportion of children for whom a doctor or other health care provider ever gave advice about healthy eating rose from 2001 to 2004 for both age groups—children ages 2-5 (from 54.7% to 60.5%) and children ages 6-17 (from 45.4% to 51.0%).
- In all four data years, advice about healthy eating from a doctor or health provider was less likely for children ages 6-17 than for children ages 2-5.

Prevention: Weight Monitoring of Overweight Children

Pediatricians are advised to monitor body mass index and excessive weight gain in children in order to recognize and address cases of overweight and obesity.[28] When health care providers alert young patients and their parents about their overweight status, a new opportunity is created to develop healthy dietary and exercise habits that may be carried into adulthood.[29]

Figure 2.31. Overweight children and adolescents ages 2-19 whose parents were told by a doctor or health professional that the child was overweight, by age group, 1999-2004



Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Health and Nutrition Examination Survey, 1999-2004.

Reference population: Civilian noninstitutionalized population ages 2-19.

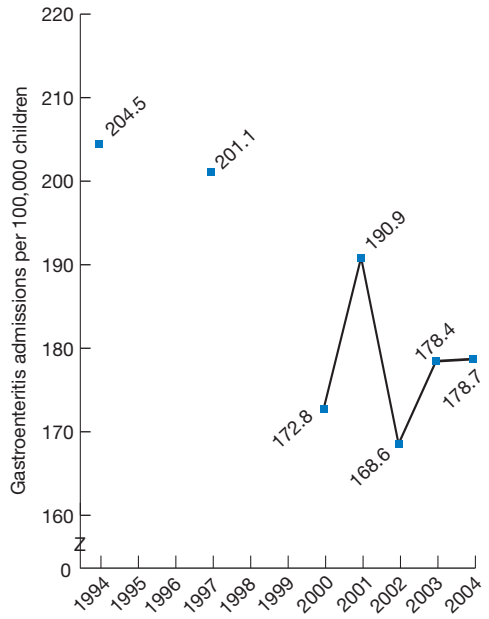
Note: Overweight children are identified using age- and sex-specific reference data from the 2000 Centers for Disease Control and Prevention body mass index (BMI) for age growth charts. Children and youth can be categorized as acceptable, underweight, at risk of overweight, or overweight. Children with BMI values at or above the 95th percentile of the sex-specific BMI growth charts are categorized as overweight.

- During 1999-2004, 38.8% of overweight children and teens ages 2-19 were told by a doctor or health professional that they were overweight (Figure 2.31).
- During 1999-2004, overweight children ages 2-5 (19.8%) and 6-11 (35.0%) were less likely than overweight children ages 12-19 (47.6%) to be told by a provider that they were overweight.

Treatment: Hospital Admissions for Pediatric Gastroenteritis

Pediatric gastroenteritis can develop into a life-threatening condition due to dehydration, especially among infants. Proper outpatient treatment of gastroenteritis may prevent hospitalization, and lower hospitalization rates may reflect access to better quality care.

Figure 2.32. Hospital admissions for pediatric gastroenteritis per 100,000 population, 1994, 1997, and 2000-2004



Source: Agency for Healthcare Research and Quality, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 1994, 1997, and 2000-2004.

Denominator: U.S. population under age 18.

Note: Adjusted by age and gender to the total U.S. population for 2000 as the standard population. Data were analyzed for two selected historical years (1994, 1997) and annually with each NHQR (2000-2004).

- From 1994 to 2004, admissions for pediatric gastroenteritis fell from 204.5 to 178.7 per 100,000 children (Figure 2.32).

Mental Health and Substance Abuse

Importance and Measures

Mortality

Rank among causes of death in the United States – suicide (2004) . . . . . 11th[2]

Alcohol-related motor vehicle deaths (2005). . . . . 16,885[30]

Students grades 9-12 who have seriously considered suicide (2005) . . . . . 16.9%[31]

Prevalence

People 12 and over with alcohol and/or illicit drug dependence or abuse (2005) . . . . . 22.2 million (9.1%)[32]

Adults age 18 and over with serious psychological distress (2005) . . . . . 24.6 million (11.3%)[32]

Adults age 18 and over with serious psychological distress and substance dependence or abuse (2005) . . . . . 5.2 million (21.3%)[32]

Adults with a major depressive episode during the past year (2005) . . . . . 15.8 million (7.3%)[32]

Lifetime prevalence of major depressive disorder (2005). . . . . 30.8 million (14.2%)[32]

Lifetime prevalence of dysthymic disorder. . . . . 2.5%[32]

12-month prevalence estimates (2001-2003) for adults with:

- Any mental disorder . . . . . 28.1%[33]
- Anxiety disorders. . . . . 18.7%[33]
- Mood disorders . . . . . 9.7%[33]
- Impulse-control disorders . . . . . 10.4%[33]
- Substance abuse disorders. . . . . 7.2%[33]

Cost

Direct medical expenditures for substance abuse and mental disorders (2001 est.). . . . . $104 billion[34]

Cost effectiveness of problem drinking screening and brief counseling. . . . . $14,000-$35,000/QALY[5]

Note: Statistics may vary from previous years due to revised and updated source statistics or addition of new data sources.

Measures

The NHQR tracks measures for the treatment of diagnosable mental disorders in general, substance abuse, and major depression. Mental health treatment is defined as counseling, inpatient care, outpatient care, or prescription medications for problems with emotions or anxiety and does not include alcohol or drug treatment. Because improved outcomes are correlated with treatment completion and length of stay in substance abuse treatment, the measure of the quality of substance abuse treatment presented in this report is

the rate of persons who complete all parts of their treatment plan. This section highlights three core measures of mental health and substance abuse treatment:

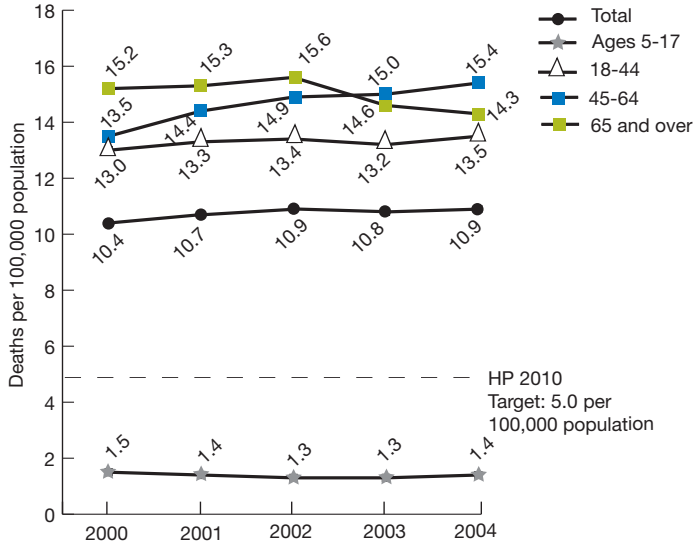
- Suicide death rate.
- Receipt of treatment for illicit drug use.
- Receipt of treatment for depression.

Findings

Prevention: Suicide Deaths

Suicide is often the result of untreated depression and may be prevented when its warning signs are detected and treated.

Figure 2.33. Suicide deaths per 100,000 population, 2000-2004



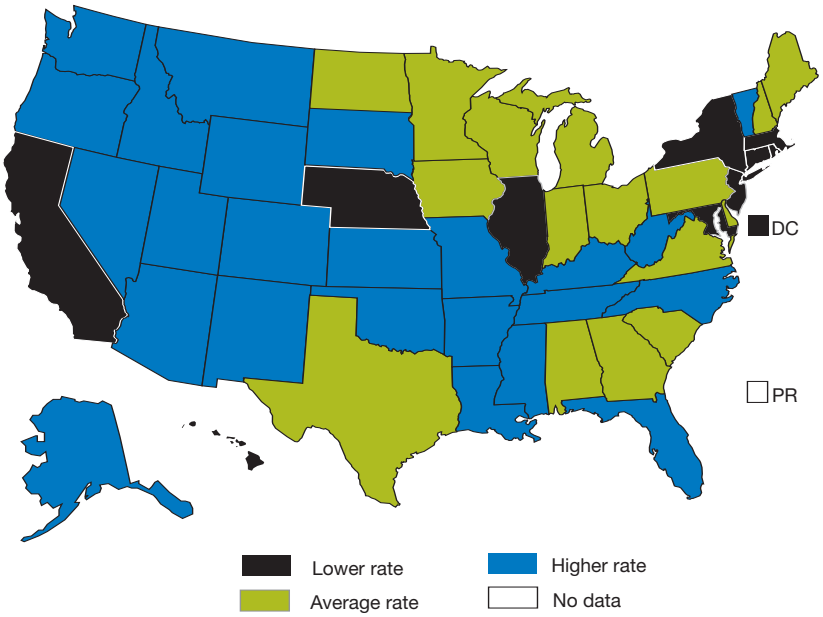
Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Vital Statistics System – Mortality, 2000-2004.

Reference population: Age 5 and over.

Note: Total rate is age adjusted to the 2000 U.S. standard population.

- From 2000 to 2004, the suicide death rate increased for the population as a whole (from 10.4 to 10.9 deaths per 100,000 population), moving further away from the Healthy People 2010 target of 5.0 suicide deaths per 100,000 population (Figure 2.33).
- From 2000 to 2004, the rate of suicide deaths per 100,000 population for children ages 5-17 remained relatively stable. During the same period, the rate decreased for adults age 65 and over (from 15.2 to 14.3) and increased for adults ages 45-64 (from 13.2 to 15.4).
- In all five data years, the rate of suicide deaths was higher for adults age 65 and over than for adults ages 18-44, and lower for children ages 5-17 than for adults ages 18-44.
- Continuation of these or similar rates could account for at least 160,000 deaths resulting from suicide over the period from 2005 to 2010.

Figure 2.34. State variation: Suicide deaths per 100,000 population, 2004



Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Vital Statistics System – Mortality, 2004.

Key: Above average = rate is significantly above the reporting States average in 2004. Below average = rate is significantly below the reporting States average in 2004.

Reference population: U.S. population.

Note: Rates are age adjusted to the 2000 standard population. The "reporting States average" is the average of all reporting States (51 in this case, including the District of Columbia), which is a separate figure from the national average.

- The State rates of suicide deaths per 100,000 population ranged from a low of 5.7 to a high of 23.4 (Figure 2.34).
- In 2004, 11 States[xix] had rates of suicide deaths that were lower than the reporting States average of 10.8 per 100,000 population, with a combined average rate of 7.8 per 100,000 population. No State has yet reached the Healthy People 2010 goal of 5.0 per 100,000 population.
- In 2004, 24 States[xx] had rates of suicide deaths that were higher than the reporting States average, with a combined average rate of 15.3 per 100,000 population.
- Michigan is the only State that showed a significant change in the rate of suicide deaths from 1999 to 2004. Over this period, the rate of suicide deaths in Michigan increased from 9.9 to 10.8 per 100,000 population.

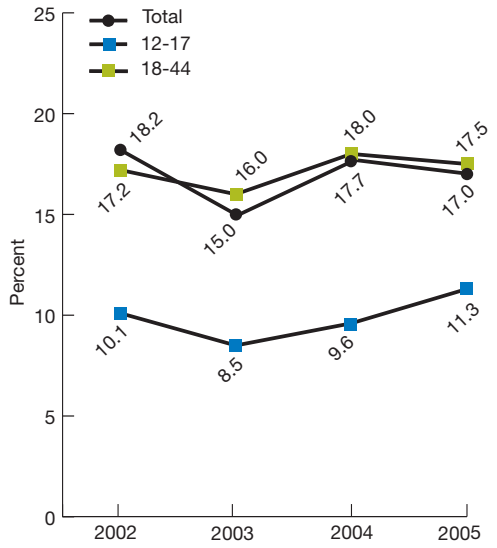
[xix] The States are California, Connecticut, District of Columbia, Hawaii, Illinois, Maryland, Massachusetts, Nebraska, New Jersey, New York, and Rhode Island.

[xx] The States are Alaska, Arizona, Arkansas, Colorado, Florida, Idaho, Kansas, Kentucky, Louisiana, Mississippi, Missouri, Montana, Nevada, New Mexico, North Carolina, Oklahoma, Oregon, South Dakota, Tennessee, Utah, Vermont, Washington, West Virginia, and Wyoming.

Treatment: Receipt of Needed Treatment for Illicit Drug Use

Substance abuse is a medical problem that requires timely treatment, not only because of its health effects but also because drug use is associated with other adverse effects, such as violent behavior. In addition, because overall health care costs may be reduced by effective substance abuse and mental health treatment,[35, 36] appropriate receipt and completion of treatment have both clinical and economic implications.

Figure 2.35. Persons ages 12-44 who received needed treatment for illicit drug use, 2002-2005



Source: Substance Abuse and Mental Health Services Administration, National Survey on Drug Use and Health, 2002-2005.

Reference population: Civilian noninstitutionalized population ages 12-44 who needed treatment for any illicit drug use.

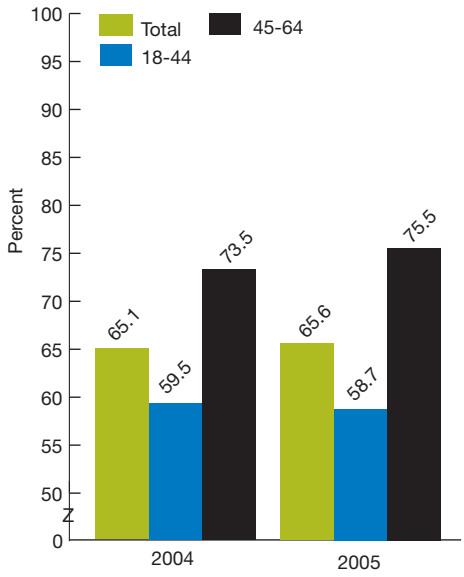
Note: Treatment refers to treatment at a specialty facility, such as a drug and alcohol inpatient and/or outpatient rehabilitation facility, inpatient hospital care, or a mental health center.

- Overall, 17.0% of persons ages 12-44 who met criteria for needing treatment for illicit drug use actually received it in 2005. This rate has not changed significantly since 2002 (Figure 2.35).
- Of people who needed treatment for illicit drug use in 2005, only 17.5% of adults ages 18-44 and 11.3% of children ages 12-17 received it. These rates remain statistically unchanged from 2002.
- In all four data years, children ages 12-17 who needed illicit drug treatment were less likely than adults ages 18-44 to receive such treatment.

Treatment: Receipt of Treatment for Depression

Almost 10% of the U.S. population will have a major depressive episode in their lifetime. Treatment can be very effective in reducing symptoms and associated illnesses and returning individuals to a productive lifestyle.

Figure 2.36. Adults ages 18-64 with a history of major depressive episode in the past year who received treatment for depression in the past year, by age group, 2004 and 2005



Source: Substance Abuse and Mental Health Services Administration, National Survey on Drug Use and Health, 2004 and 2005.

Reference population: U.S. civilian noninstitutionalized population ages 18-64.

- In 2005, 65.6% of adults ages 18-64 with a major depressive episode received treatment for depression (Figure 2.36). There was no significant improvement in this measure compared with 2004.
- In 2005, among adults who experienced a major depressive episode, those ages 45-64 (75.5%) were more likely than those ages 18-44 (58.7%) to receive treatment for depression. The 45-64 age group was also more likely to receive treatment in 2004.

Respiratory Diseases

Importance and Measures

Mortality

Number of deaths due to lung diseases (2003) . . . . . 243,000[37]

Number of deaths, influenza and pneumonia combined (2004) . . . . . 59,664[2]

Cause of death rank, influenza and pneumonia combined (2004) . . . . . 8th[2]

Prevalence

People 18 and over who have asthma (2005) . . . . . 15,697,000[38]

People under 18 who have asthma (2005) . . . . . 6,531,000[39]

Incidence

Annual number of cases of the common cold (est.) . . . . . >1 billion[40]

Annual number of pneumonia cases due to *Streptococcus pneumoniae* . . . . . 500,000[41]

New cases of tuberculosis (2006) . . . . . 13,767[42]

Cost

Total cost of lung diseases (2006 est.) . . . . . $144.2 billion[4]

Direct medical costs of lung diseases (2006 est.) . . . . . $87.0 billion[4]

Total approximate cost of upper respiratory infections (annual) . . . . . $40 billion[43]

Total cost of asthma (2004) . . . . . $16.1 billion[37]

Direct medical costs of asthma (2004) . . . . . $11.5 billion[37]

Cost effectiveness of influenza immunization . . . . . $0-$14,000/QALY[5]

Note: Statistics may vary from previous years due to revised and updated source statistics or addition of new data sources.

Measures

The NHQR tracks several quality measures for prevention and treatment of this broad category of illnesses that includes influenza, pneumonia, asthma, upper respiratory infection, and tuberculosis. The five core report measures highlighted in this section are:

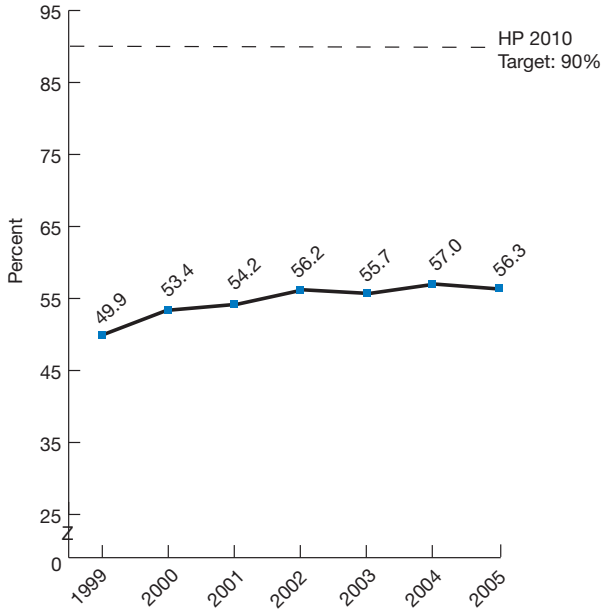
- Pneumococcal vaccination.
- Receipt of recommended care for pneumonia.
- Receipt of antibiotics for the common cold.
- Completion of tuberculosis therapy.
- Hospital admissions for pediatric asthma.

Findings

Prevention: Pneumococcal Vaccination

Vaccination is a cost effective strategy for reducing illness and death associated with pneumococcal disease of the lungs (pneumonia) and influenza.

Figure 2.37. Noninstitutionalized adults age 65 and over who ever received pneumococcal vaccination, 1999-2005



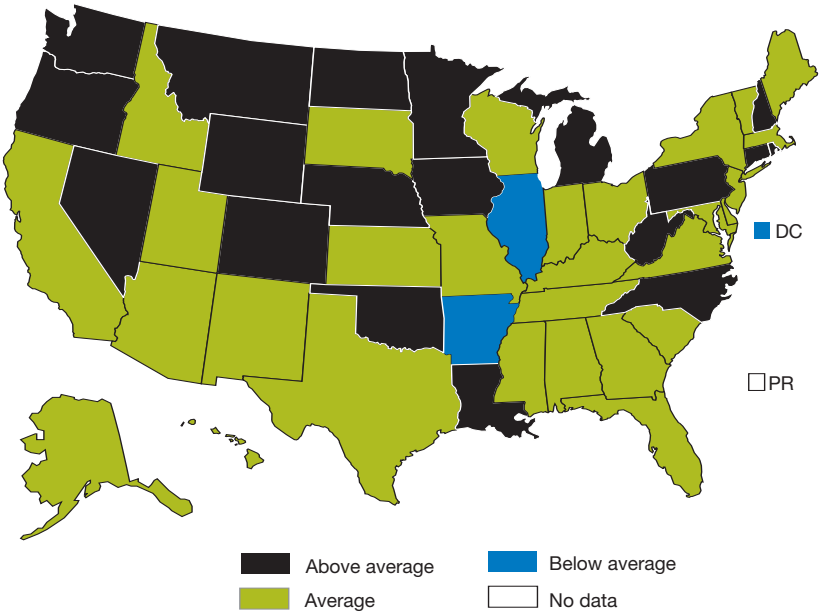
Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Health Interview Survey, 1999-2005.

Reference population: Civilian noninstutionalized population age 65 and over.

Note: Age adjusted to the 2000 U.S. standard population.

- The percent of adults age 65 and over who ever received a pneumococcal vaccination increased from 49.9% in 1999 to 56.3% in 2005 (Figure 2.37). The Healthy People 2010 target of 90% is unlikely to be met until after 2020 at this rate of change.

Figure 2.38. State variation: Adults age 65 and over who ever received pneumococcal vaccination, 2005



Source: Centers for Disease Control and Prevention, Behavioral Risk Factor Surveillance System, 2005.

Reference population: Civilian noninstitutionalized population age 65 and over.

Key: Above average = rate is significantly above the reporting States average in 2005. Below average = rate is significantly below the reporting States average in 2005.

Note: Age adjusted to the 2000 U.S. standard population. "Reporting States average" is the average of all reporting States (51 in this case, including the District of Columbia), which is a separate figure from the national average.

- In 2005, the reporting States average of adults 65 and over who had ever received a pneumococcal vaccination was 64.1%, with a range from 51.4% to 71.7% (Figure 2.38).
- Nineteen States[xxi] were significantly above the reporting States average in 2005, with a combined average rate of 69.3%.
- Three States[xxii] were significantly below the reporting States average in 2005, with a combined average rate of 55.2%.
- Eighteen States showed improvement between 2001 and 2005 in the number of adults age 65 and over who had ever received a pneumococcal vaccination.[xxiii] No State showed a significant decrease on this measure over this time period.

[xxi] The States are Colorado, Connecticut, Iowa, Louisiana, Michigan, Minnesota, Montana, Nebraska, Nevada, New Hampshire, North Carolina, North Dakota, Oklahoma, Oregon, Pennsylvania, Rhode Island, Washington, West Virginia, and Wyoming.

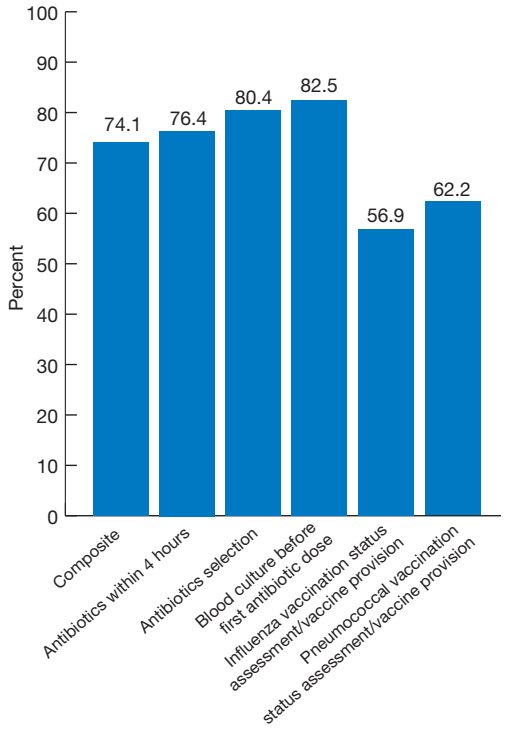
[xxii] The States are Arkansas, District of Columbia, and Illinois.

[xxiii] The States are Connecticut, Indiana, Kentucky, Louisiana, Michigan, Minnesota, Mississippi, Missouri, Nebraska, New Hampshire, New Jersey, North Dakota, Oklahoma, Pennsylvania, South Carolina, South Dakota, Tennessee, and West Virginia.

Treatment: Receipt of Recommended Care for Pneumonia

Recommended care for patients with pneumonia includes receipt of: (1) initial antibiotics within 4 hours of hospital arrival; (2) antibiotics consistent with current recommendations; (3) blood culture before antibiotics are administered; (4) influenza vaccination status assessment/vaccine provision; and (5) pneumonia vaccination status assessment/vaccine provision. The NHQR tracks receipt of this care for each measure and as an overall composite.

Figure 2.39. Patients with pneumonia who received recommended care for pneumonia: Overall composite and five components, 2005



Source: Centers for Medicare & Medicaid Services, Quality Improvement Organization Program, 2005.

Denominator: Patients hospitalized with a principal diagnosis of pneumonia or a principal diagnosis of either septicemia or respiratory failure and secondary diagnosis of pneumonia.

Note: Beginning in 2005, the data collection method changed from the abstraction of randomly selected medical records for Medicare beneficiaries to the receipt of hospital self-reported data for all payer types.

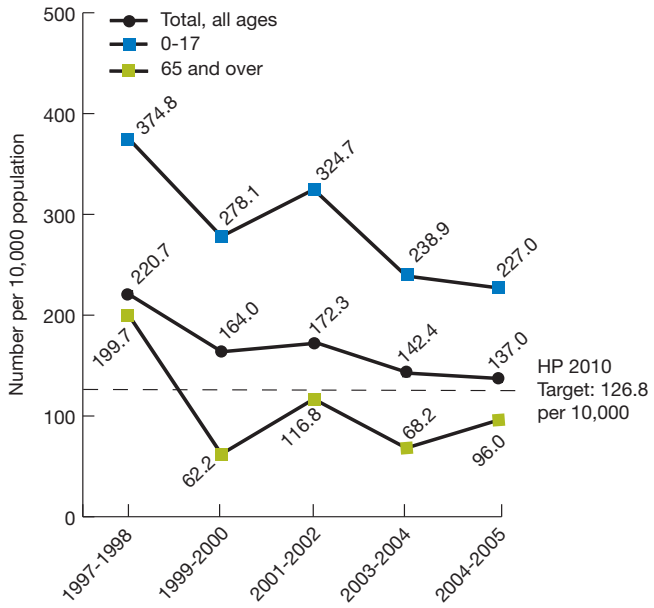
- In 2005, 74.1% of adult patients with pneumonia received the recommended care included in the overall pneumonia treatment composite measure (Figure 2.39).
- Among the five components of the composite measure, patients were most likely to receive blood cultures when clinically appropriate (82.5%) and least likely to have their influenza vaccination status assessed and receive the vaccine if indicated (56.9%).
- Revisions to two component measures related to recommended care for pneumonia should be noted:
  - The individual measure of appropriate antibiotic selection for community-acquired pneumonia was changed to exclude patients with health-care-associated pneumonia from the denominator used in the calculation.

- The individual measure for the collection of samples for blood culture within 24 hours of hospital arrival was changed so that only those patients who were admitted to the intensive care unit within 24 hours of hospital arrival are included in the denominator.

Treatment: Receipt of Antibiotics for the Common Cold

Taking antibiotics does not treat or relieve symptoms of the common cold and may lead to the development of antibiotic-resistant bacteria. Although antibiotic prescribing patterns are slowly improving, overuse of antibiotics is still a concern.[44] Children have the highest rates of antibiotic use and the highest rates of infection with antibiotic-resistant bacterial pathogens.[45]

Figure 2.40. Rate of antibiotic drug utilization at ambulatory care visits with a diagnosis of common cold per 10,000 population, overall, for children under age 18, and for adults 65 and over, 1997-2005



Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Ambulatory Medical Care Survey and National Hospital Ambulatory Medical Care Survey, 1997-1998, 1999-2000, 2001-2002, 2003-2004, and 2004-2005.

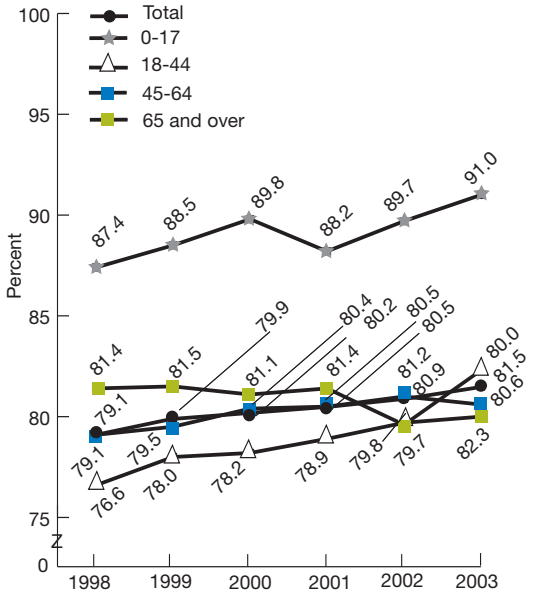
Denominator: U.S. noninstitutionalized population.

- In 2004-2005, the overall rate of antibiotics prescribed at visits with a diagnosis of the common cold stood at 137.0 per 10,000, above the Healthy People 2010 target of 126.8 per 10,000 (Figure 2.40). However, if current trends continue, this target will be achieved before the year 2010.
- From 1997-1998 to 2004-2005, the rate of antibiotic prescription at visits with a diagnosis of common cold decreased overall for persons of all ages and for children under age 18. The rate did not change significantly for adults under age 65 (data not shown).

Treatment: Completion of Tuberculosis Therapy

In order to be effective for individuals as well as the public, tuberculosis therapy must be taken to its completion. Failure to complete tuberculosis therapy puts patients at increased risk for treatment failure and for spreading the disease to others. Even worse, it may result in the development of drug-resistant strains of the disease.[46]

Figure 2.41. Completion of tuberculosis therapy within 1 year, by age group, 1998-2003



Source: Centers for Disease Control and Prevention, National TB Surveillance System, 1998-2003.

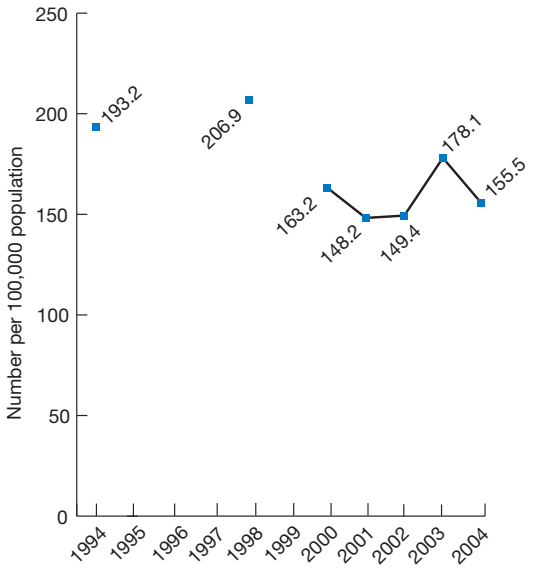
Reference population: U.S. civilian noninstitutionalized population.

- From 1998 to 2003, the rate of completion of tuberculosis therapy within 1 year rose from 79.1% to 81.5% (Figure 2.41).
- Children under age 18 and adults ages 18-44 showed a significant increase in completion of tuberculosis therapy. The percentages for these groups rose from 87.4 % and 76.6% in 1998 to 91.0% and 80.0% in 2003, respectively.
- In all six data years, children under age 18 were more likely than adults ages 18-44 to complete tuberculosis therapy within 1 year.

Management: Hospital Admissions for Pediatric Asthma

Asthma can be effectively controlled over the long term with recommended medications (depending on the severity of the disease), routine checkups, education of patients, and use of asthma management plans. Preventing hospital admissions for asthma is one measure of successful management of asthma at the population level.

Figure 2.42. Pediatric hospital admissions for asthma per 100,000 population ages 2-17, 1994, 1997, and 2000-2004



Source: Agency for Healthcare Research and Quality, Healthcare Cost and Utilization Project Nationwide Inpatient Sample, 1994, 1997, and 2000-2004.

Denominator: Children ages 2-17.

Note: Rates are adjusted by age and gender, using the total U.S. population for 2000 as the standard population. The estimates in this chart differ from those reported in the 2006 NHQR and have been updated for the 2007 NHQR. The 2006 NHQR estimates included children ages 0-17. Data were analyzed for two selected historical years (1994, 1997) and annually with each NHQR (2000-2004).

- In 2004, there were 155.5 admissions for asthma per 100,000 children ages 2-17. This rate was less than the rate of 193.2 per 100,000 in 1994 but not significantly different from the rates in 2000 to 2003 (Figure 2.42).

Nursing Home, Home Health, and Hospice Care

Importance and Measures

Demographics

Number of nursing home residents (2004) . . . . . 1,442,503[47]

Number of home health patients (2000) . . . . . 1,355,290[48]

Number of current hospice care patients (2000) . . . . . 105,496[49]

Discharges from nursing homes (1998-1999) . . . . . 2,500,000[47]

Discharges from home health agencies (2000) . . . . . 7,179,000[48]

Discharges from hospice care (2000) . . . . . 621,100[49]

Cost

Total costs of nursing home services (2005) . . . . . $121.9 billion[50]

Total costs of home health services (2005) . . . . . $47.5 billion[50]

Annual national expenditures for hospice care for decedents (1992-1996) . . . . . $1.232 billion[51]

Percent of health care expenditures for hospice care in last 6 months of life . . . . . 74%[51]

Note: Statistics may vary from previous years due to revised and updated source statistics or addition of new data sources. Cost estimates for nursing home and home health services include only costs for freestanding skilled nursing facilities, nursing homes, and home health agencies, and not those that are hospital based.

Measures

The NHQR tracks 14 measures of nursing home care. Care is tracked among both short-stay and long-stay residents. Short-stay residents commonly have a brief stay in a nursing home after a hospitalization which, in turn, is usually followed by return to their home. Care for short-stay residents is often funded by the Medicare Skilled Nursing Facility benefit. Long-stay residents, in contrast, are expected to stay in the nursing home either permanently or for an extended period of time. The NHQR also tracks 12 measures for home health care that reflect improvement or deterioration during the course of care. Two core report measures on nursing home care and two core report measures on home health care are highlighted in this section:

- Use of restraints on long-stay nursing home residents.
- Presence of pressure ulcers in nursing home residents.
- Improvement in ambulation in home health episodes.
- Acute care hospitalization of home health patients.

In addition, this year the NHQR includes a supplemental measure from the 2004 National Nursing Home Survey:

- Pain management for nursing home residents.

Building on last year's first presentation of supplemental measures of quality of hospice care, this year's NHQR extends its analysis of this important area. Hospice care is delivered at the end of life to patients with a terminal illness or condition requiring comprehensive medical care as well as psychosocial and spiritual support for the patient and family. The goal of end-of-life care is to achieve a "good death," defined by the Institute of Medicine as one that is "free from avoidable distress and suffering for patients, families, and caregivers; in general accord with the patients' and families' wishes; and reasonably consistent with clinical, cultural, and ethical standards."[52]

The National Hospice and Palliative Care Organization's Family Evaluation of Hospice Care survey examines the quality of hospice care for dying patients and their family members. Family respondents report how well hospices respect patient wishes, communicate about illness, control symptoms, support dying on one's own terms, and provide family emotional support.[53, xxiv]

The two supplemental measures presented here from the National Hospice and Palliative Care Organization's Family Evaluation of Hospice Care are:

- Receipt of right amount of pain medicine.
- Receipt of care consistent with patient's stated end-of-life wishes.

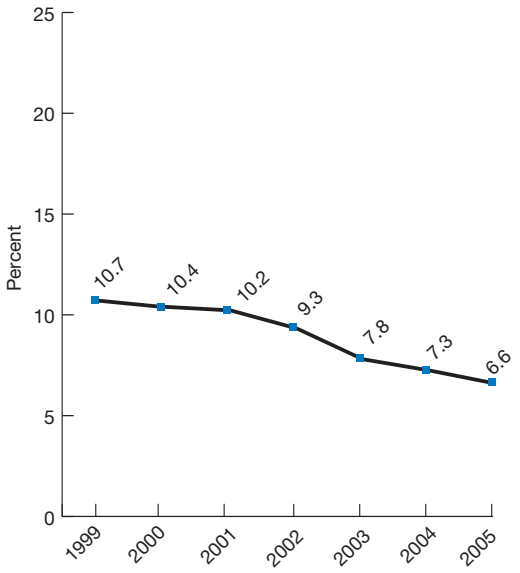
[xxiv] This survey provides unique insight into end-of-life care and captures information about a large proportion of hospice patients but is limited by nonrandom data collection and a response rate of about 40%. Survey questions were answered by family members of patients, who might not be fully aware of the patients' wishes and concerns. These limitations should be considered when interpreting these findings.

Findings

Management: Use of Restraints on Long-Stay Nursing Home Residents

A physical restraint is any device, material, or equipment that keeps a resident from moving freely. A resident who is restrained daily can become weak and develop other medical complications. The use of physical and pharmacological restraints can result in a variety of emotional, mental, and physical problems. According to regulations for the nursing home industry, restraints should be used only to ensure the physical safety of a nursing home resident.

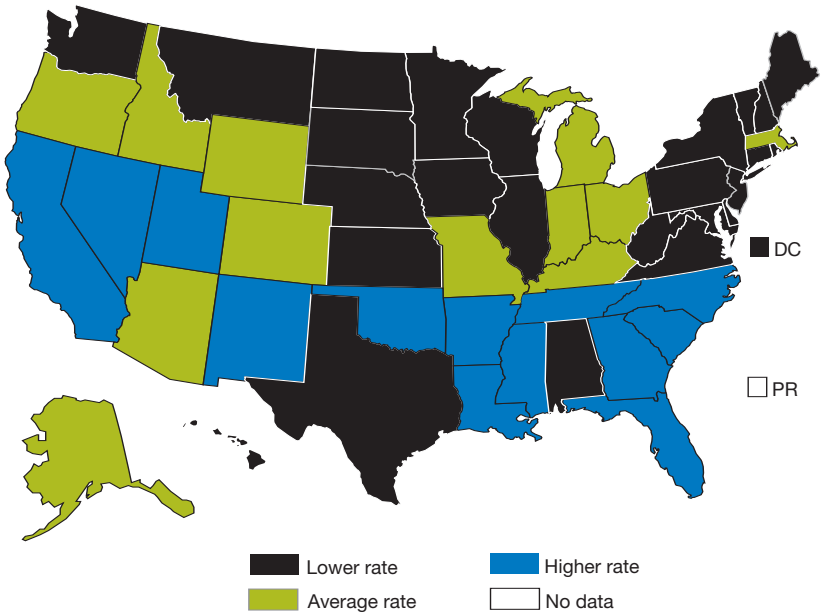
Figure 2.43. Long-stay nursing home residents with physical restraints, 1999-2005



Source: Centers for Medicare & Medicaid Services, Minimum Data Set, 1999-2005. Data are from the third quarter of each calendar year.
Denominator: All long-stay residents in Medicare or Medicaid certified nursing home facilities.
Note: Restraint use was determined based on a 7-day assessment period.

- The overall proportion of long-stay nursing home residents who are physically restrained decreased from 10.7% in 1999 to 6.6% in 2005 (Figure 2.43).
- Decreases in the use of physical restraints were also observed for all age groups (data not shown).

Figure 2.44. State variation: Long-stay nursing home residents with physical restraints, 2006



Source: Centers for Medicare & Medicaid Services, Minimum Data Set, Nursing Home Compare, 2006.

Denominator: All long-stay residents in Medicare or Medicaid certified nursing and long-term care facilities.

Key: Higher rate = State has rate in use of restraints higher than the reporting States average in 2006. Lower rate = State has rate in use of restraints lower than the reporting States average in 2006.

Note: The "reporting States average" is the average of all reporting States (51 in this case, including the District of Columbia), which is a separate figure from the national average.

- The reporting States average on this measure improved between 2002 and 2006, dropping from 9.7% to 5.9% during this time period. There was considerable variation in this measure among States in 2006. States ranged from a low of 1.3% to a high of 13.4% in 2006 (Figure 2.44).
- Twenty-six States[xxv] outperformed the reporting States average (i.e., less use of physical restraints on long-stay nursing home residents), with a combined average rate of 3.0% in 2006.
- Thirteen States[xxvi] had rates higher than the reporting States average (i.e., greater use of restraints), with a combined average rate of 9.5% in 2006.
- In seven States,[xxvii] the rate of long-stay nursing home residents with physical restraints did not improve from 2002 to 2006 (data not shown).

[xxv] The States are Alabama, Connecticut, Delaware, District of Columbia, Hawaii, Illinois, Iowa, Kansas, Maine, Maryland, Minnesota, Montana, Nebraska, New Hampshire, New Jersey, New York, North Dakota, Pennsylvania, Rhode Island, South Dakota, Texas, Vermont, Virginia, Washington, West Virginia, and Wisconsin.

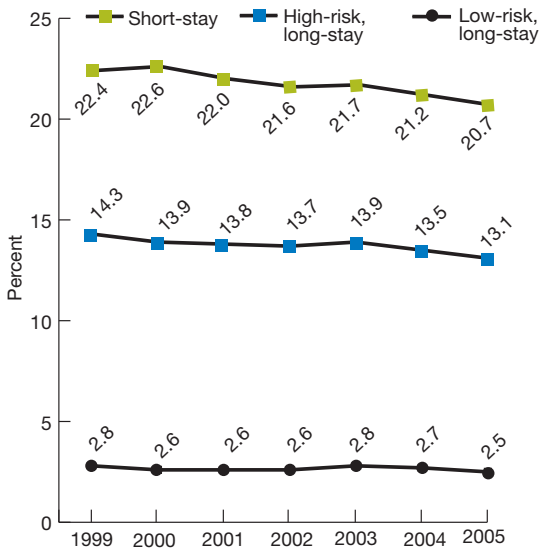
[xxvi] The States are Arkansas, California, Florida, Georgia, Louisiana, Mississippi, Nevada, New Mexico, North Carolina, Oklahoma, South Carolina, Tennessee, and Utah.

[xxvii] The States are Alaska, Delaware, Florida, New Jersey, New Mexico, Oklahoma, and Utah.

Management: Presence of Pressure Ulcers in Nursing Home Residents

A pressure ulcer, or pressure sore, is an area of broken down skin caused by sitting or lying in one position for an extended period of time. Pressure sores can be painful, take a long time to heal, and cause other complications such as skin or bone infections. Pressure sores are classified into four stages (stages 1 through 4, with stage 4 being the most severe) according to the depth or type of tissue damage. The measures presented here include all four stages.

Figure 2.45. Short-stay and long-stay nursing home residents with pressure ulcers, by type of resident, 1999-2005



Source: Centers for Medicare & Medicaid Services, Minimum Data Set, 1999-2005.

Denominator: All residents in Medicare or Medicaid certified nursing and long-term care facilities.

- There were only minor improvements in pressure sore measures for all three types of nursing home residents between 1999 and 2005.
- From 1999 to 2005, the rate of short-stay residents with pressure ulcers fell from 22.4% to 20.7% (Figure 2.45).[xxviii] For high-risk, long-stay residents, the rate fell from 14.3% to 13.1%, and for low-risk, long-stay residents, the rate fell from 2.8% to 2.5%.[xxix]
- High-risk, long-stay residents have a fivefold greater risk of having pressure sores than low-risk, long-stay residents.

[xxviii] Short-stay refers to residents who are admitted to a facility and stay fewer than 30 days; these admissions, also referred to as "post-acute," typically follow an acute care hospitalization and involve high-intensity rehabilitation or clinically complex care.

[xxix] Long-stay (also know as "chronic care") refers to residents who enter a nursing facility typically because they are no longer able to care for themselves at home; they tend to remain in the facility from several months to several years. High-risk residents are those who are in a coma, who do not get or absorb the nutrients they need, or who cannot move or change position on their own. Conversely, low-risk residents can be active, can change positions, and are getting and absorbing the nutrients they need.

Management: Pain Management for Nursing Home Residents

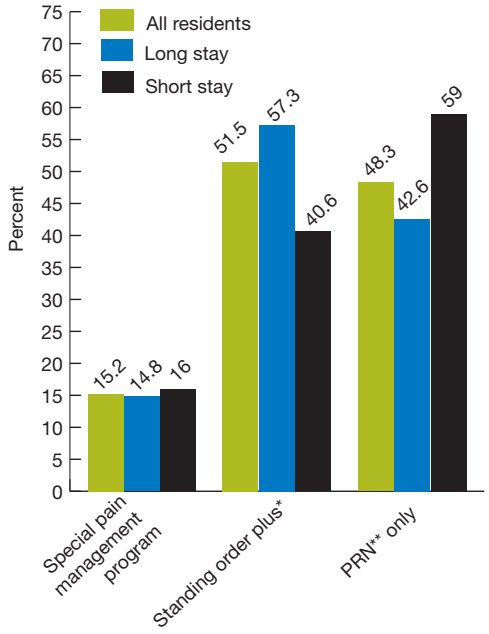
Adequate pain management is an important indicator of quality of care and quality of life. Untreated and under-treated pain are common problems among the elderly living in the community[54] as well as in nursing homes.[55] Assessment and management of pain in this population is complex and is made more difficult with high prevalence of multiple chronic conditions, dementia, and other impairments.[54, 56]

The percentage of residents with moderate or severe pain has been reported as a quality measure in the Centers for Medicare & Medicaid Services (CMS) Nursing Home Compare Web site and in data tables for previous NHQRs. However, corresponding national information about how pain is managed was not previously available. The 2004 National Nursing Home Survey, a national probability survey of 1,174 nursing facilities, collected information from patient records and other sources used to document the occurrence, intensity, and management[xxx] of pain over the past week. For this analysis, residents were divided into groups according to length of stay in order to approximate pain measures from Nursing Home Compare (which uses CMS Minimum Data Set data). Short stay was defined as less than 100 days and long stay as 100 days or more.

Among residents with moderate, severe, or excruciating pain, the use of an as-needed *(pro re nata* [PRN]) pain management strategy varies by sex, age, and condition. Regardless of these demographic or clinical differences, medication only as needed is a common management strategy for intense pain. Use of a PRN-only pain management strategy, although appropriate in some cases, should largely be viewed as less than optimal care, particularly for those reporting higher levels of pain. For these patients, pain management strategies that include treatment according to a regular schedule (i.e., standing order or special pain management program) are more likely to be appropriate care.

[xxx] Administration of medication only as needed, by standing order, or by use of nonpharmacologic strategies.

Figure 2.46. Pain management for nursing home residents with moderate, severe, or excruciating pain, by type of resident, 2004



* Standing order plus PRN and other nonpharmacologic methods.

** PRN = *pro re nata* and refers to the administration of medication only as needed.

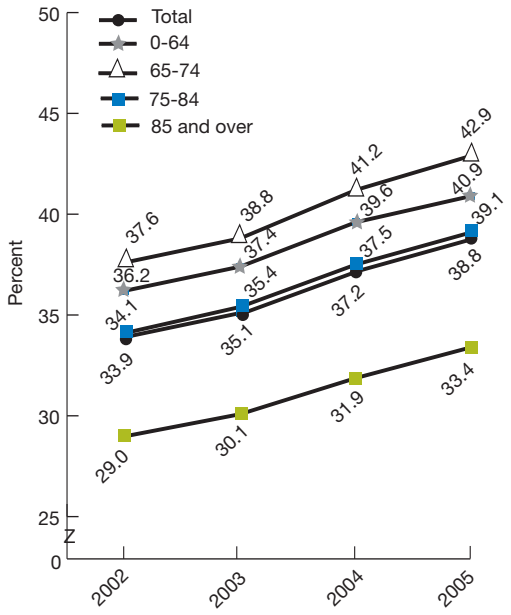
Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Nursing Home Survey, 2004

- Despite reporting similar levels of pain, a greater percentage of short-stay than long-stay residents with moderate, severe, or excruciating pain had a PRN-only strategy (59.0% versus 42.6%; Figure 2.46).
- Overall, 23% of residents reported having some level of pain (data not shown). A significantly higher percentage of short-stay residents than long-stay residents reported having pain (35% versus 19%) and having moderate, severe, or excruciating pain (26% versus 13%).
- More men than women (53% versus 47%) and more people under age 65 than age 65 and over (58% versus 47%) with moderate, severe, or excruciating pain had a PRN-only management strategy (data not shown).
- A large percentage of residents (43%-58%) with diagnoses or conditions strongly associated with pain—cancer, musculoskeletal disorders, fractures, and posthospital care—had a PRN-only pain management strategy (data not shown).

Management: Improvement in Ambulation in Home Health Episodes

Improvement in ambulation/locomotion is demonstrated by an increase in the percentage of patients who improve walking or mobility with a wheelchair. Many patients receiving home health care may need help to walk safely. This assistance can come from another person or from equipment, such as a cane. Patients who use a wheelchair may have difficulty moving around safely, but if they can perform this activity with little assistance, they are more independent, self-confident, and active. In cases of patients with some neurological conditions, such as progressive multiple sclerosis or Parkinson's disease, ambulation may not improve even when the nursing home or home health service provides good care.

Figure 2.47. Home health episodes showing ambulation/locomotion improvement, by age group, 2002-2005



Source: Centers for Medicare & Medicaid Services, Outcome and Assessment Information Set (OASIS), 2002-2005.

Denominator: Episodes for adult nonmaternity patients receiving at least some skilled home health care and not already performing at the highest level according to the OASIS question on ambulation.

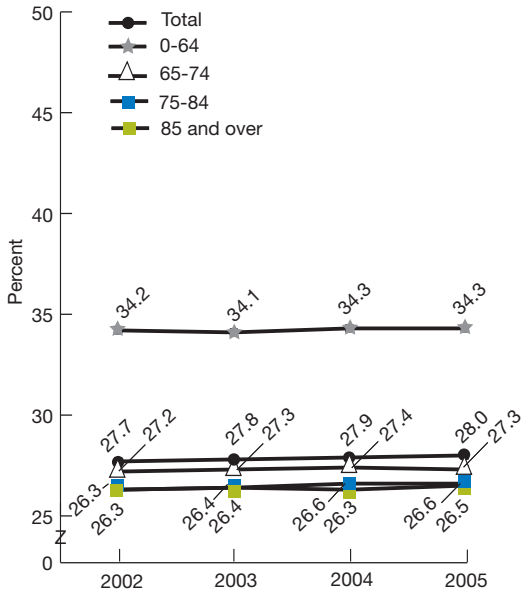
- From 2002 to 2005, the proportion of home health episodes[xxxi] showing improvement in ambulation/locomotion increased (Figure 2.47) from 33.9% to 38.8%.
- The proportion of home health episodes showing ambulation/locomotion improvement also increased for every age group.

[xxxi] An "episode" is the time during which a patient is under the direct care of a home health agency. It starts with the beginning/resumption of care and finishes when the patient is discharged or transferred to an inpatient facility. The same patient may be involved in multiple episodes. An episode is a 60-day time period.

Management: Acute Care Hospitalization of Home Health Patients

Improvement in acute care hospitalization of home health patients is demonstrated by a decrease in the percentage of patients who had to be admitted to the hospital. Patients may need to go into the hospital while they are getting home health care. Depending on the severity of the patient's condition, this may not be avoidable even with good home health care.

Figure 2.48. Home health episodes with acute care hospitalization, by age group, 2002-2005



Source: Centers for Medicare & Medicaid Services, Outcome and Assessment Information Set, 2002-2005.

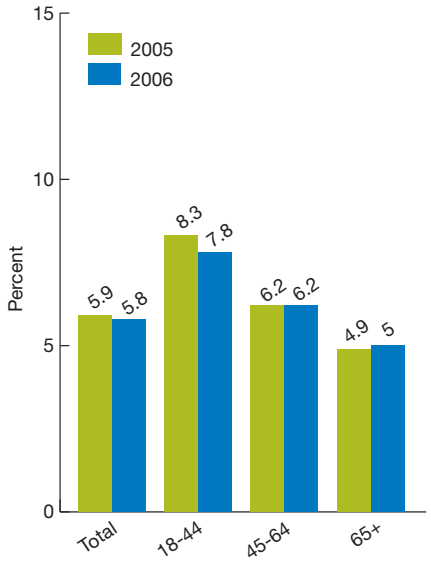
Denominator: Episodes for adult nonmaternity patients receiving at least some skilled home health care.

- In 2005, 28.0% of home health episodes ended in hospitalization (Figure 2.48).
- Between 2002 and 2005, the rate did not improve for the entire population or for any age group.
- In all four data years, home health patients under 65 years of age were more likely than patients ages 65-74 to require hospitalization. This may be related to the fact that home health patients under age 65 tend to have different characteristics, such as greater degrees of disability and illness.

Management: Receipt of Right Amount of Pain Medicine by Hospice Patients

Addressing the comfort aspects of care, such as relief from pain, fatigue, and nausea, is an important component of hospice care.[xxxii]

Figure 2.49. Hospice patients age 18 and over who did not receive the right amount of medicine for pain, by age group, 2005 and 2006



Source: National Hospice and Palliative Care Organization, Family Evaluation of Hospice Care, 2005 and 2006.

Denominator: Adult hospice patients.

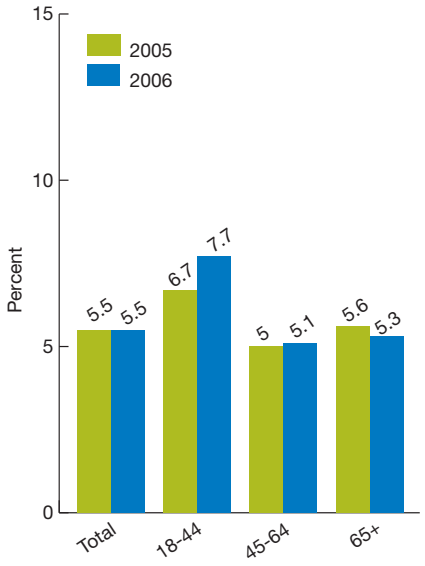
- The proportion of hospice patients whose families reported that they did not receive the right amount of medicine for pain was 5.8% in 2006 (Figure 2.49).
- Families of hospice patients ages 18-44 and ages 45-64 were more likely to report the patient did not receive the right amount of pain medicine (7.8% and 6.2%, respectively) in 2006 compared with families of patients age 65 and over (5.0%).
- Between 2005 and 2006, the proportion of hospice patients whose families reported that they did not receive the right amount of medicine for pain did not improve significantly overall or for any adult age groups (18-44, 45-64, 65 and over).

[xxxii] This measure is based on responses from a family member of the deceased. In interpreting it, it should be noted that family members may or may not be able to determine whether the right amount of medicine for pain was administered.

Management: Receipt of Care Consistent With Patient's Stated End-of-Life Wishes

End-of-life care should respect a patient's stated end-of-life wishes. This includes shared communication and decision-making between providers and hospice patients and their family members and respect for cultural beliefs.

Figure 2.50. Hospice patients age 18 and over who did not receive care consistent with their stated end-of-life wishes, by age group, 2005 and 2006



Source: National Hospice and Palliative Care Organization, Family Evaluation of Hospice Care, 2005 and 2006.

Denominator: Adult hospice patients.

- The proportion of hospice patients whose families reported that they did not receive end-of-life care consistent with their stated wishes was 5.5% in 2006 (Figure 2.50).
- In 2006, hospice patients ages 18-44 were less likely than patients ages 45-64 and 65 and over to receive end-of-life care consistent with their wishes.
- Between 2005 and 2006, the proportion of hospice patients whose families reported that they did not receive end-of-life care consistent with their stated wishes did not improve significantly overall or for any adult age groups (18-44, 45-64, 65 and over).

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Chapter 3. Patient Safety

The Institute of Medicine defined patient safety in its 1999 report, *To Err Is Human*, as freedom from accidental injury due to medical care or medical errors.[1]

Importance and Measures

Mortality

Number of Americans who die each year from medical errors (1999 est.) . . . . . 44,000-98,000[1]

Number of Americans who die in the hospital each year due to 18 types of medical injuries (2000 est.) . . . . . at least 32,000[2]

Cost

Cost attributable to medical errors (in lost income, disability, and health care costs) (1999 est.) . . . . . $17 billion-$29 billion[1]

Measures

Much progress has been made in recent years in raising awareness, developing event reporting systems, and developing national standards for data collection. Data remain incomplete for a comprehensive national assessment of patient safety.[3] Nevertheless, several measures are available to provide insight into the level of patient safety in the United States.

This year's chapter highlights six core measures relating to postoperative complications, other complications of hospital care, and complications of medications:

- Postoperative care composite: pneumonia, urinary tract infection, and/or venous thromboembolic event.
- Appropriate timing of antibiotics to prevent infections in surgical patients.
- Adverse events associated with central venous catheters.
- Deaths following complications of care.
- Adverse drug events in the hospital.
- Prescription of inappropriate medications to the elderly.

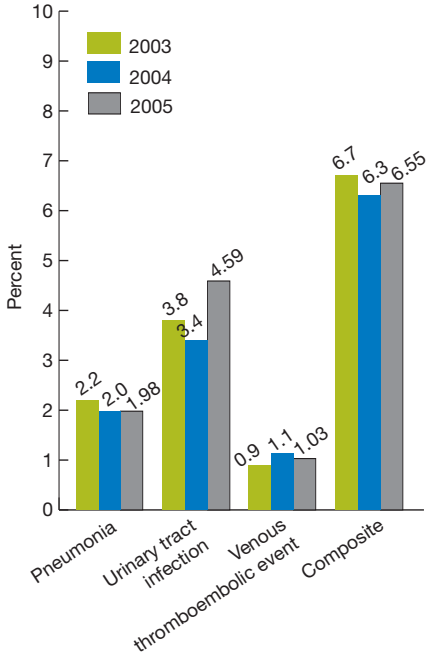
Findings

Postoperative Complications

Adverse health events can occur during episodes of care, especially during and right after surgery. Although some of the events may be related to a patient's underlying condition, many of them can be avoided if appropriate care is provided.

Postoperative care composite: pneumonia, urinary tract infection, or venous thromboembolic event. Complications after surgery may include, but are not limited to, pneumonia, urinary tract infection, and blood clots.

Figure 3.1. Medicare surgical patients with postoperative pneumonia, urinary tract infection, and venous thromboembolic event and composite, 2003-2005



Source: Centers for Medicare & Medicaid Services, Medicare Patient Safety Monitoring System, 2003-2005.

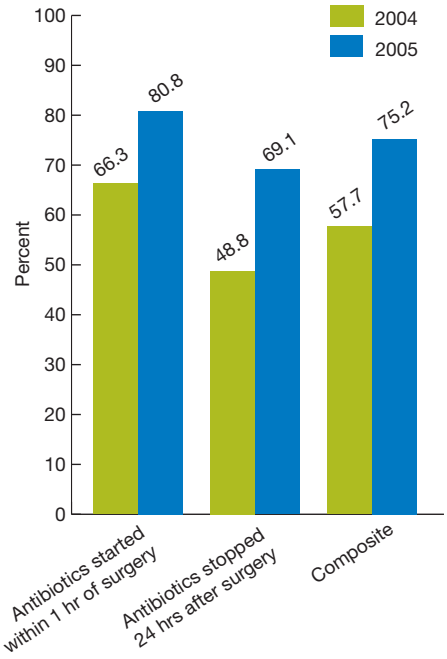
Denominator: Hospitalized Medicare patients having major surgery and meeting specific criteria for each measure.

Note: In 2005, the measure for postoperative urinary tract infection was refined to include only major surgery patients with catheter-associated urinary tract infection. Standard errors for estimates of the percentages of surgical patients with postoperative complications in 2003 were imputed, based on standard errors for estimates in 2005.

- From 2003 to 2005, the percentage of surgical patients with postoperative pneumonia or a venous thromboembolic event did not change significantly (Figure 3.1). The percentage of surgical patients who developed a urinary tract infection did show a slight increase; however, it should be noted that this measure changed in 2005 to include only patients with catheter-associated urinary tract infection.

Appropriate timing of antibiotics among surgical patients. Infections acquired during hospital care (nosocomial infections) are one of the most serious safety concerns. A common hospital-acquired infection is a wound infection following surgery. Hospitals can reduce the risk of wound infection after surgery by making sure patients get the right antibiotics at the right time on the day of their surgery. Research shows that surgery patients who get antibiotics within the hour before their operation are less likely to get wound infections; getting an antibiotic earlier, or after surgery begins, is not as effective. However, taking these antibiotics for more than 24 hours after routine surgery is usually not necessary and can increase the risk of side effects such as stomach aches, serious types of diarrhea, and antibiotic resistance. Among adult Medicare patients having surgery, the NHQR tracks receipt of antibiotics within 1 hour prior to surgical incision, discontinuation of antibiotics within 24 hours after end of surgery, and a composite of these two measures.

Figure 3.2. Appropriate timing of antibiotics received by adult patients having surgery, overall composite and two components, 2004 and 2005



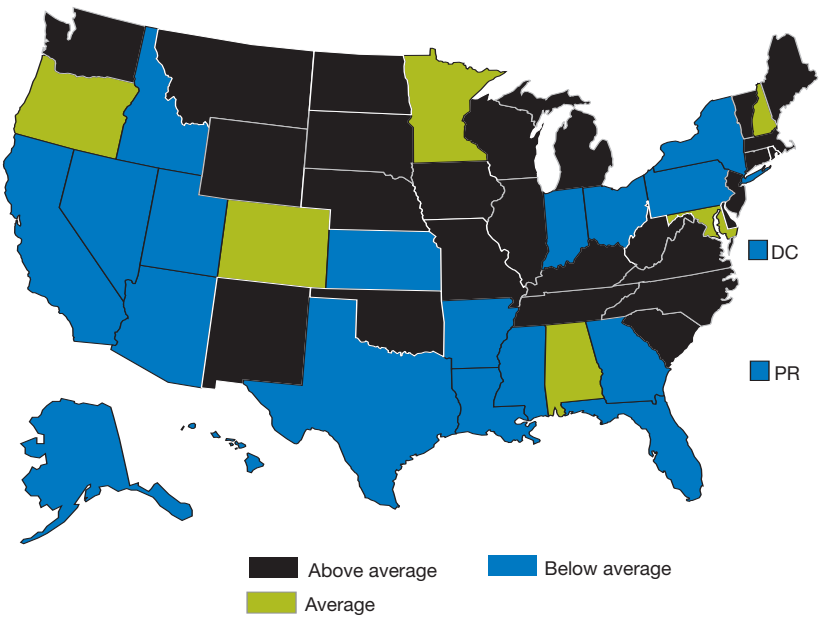
Source: Centers for Medicare & Medicaid Services, Quality Improvement Organization Program, 2004 and 2005.

Denominator: Hospitalized patients having surgery.

Note: Beginning in 2005, the data collection method changed from the abstraction of randomly selected medical records for Medicare beneficiaries to the receipt of hospital self-reported data for all payer types.

- In 2005, 80.8% of adult patients having surgery received antibiotics within 1 hour of surgery, and 69.1% had their antibiotics stopped within 24 hours of surgery (Figure 3.2).
- Appropriate timing of antibiotics received by adult patients having surgery improved significantly between 2004 (57.7%) and 2005 (75.2%), both overall and for the two components of the composite measure.

Figure 3.3. State variation: Appropriate timing of antibiotics received by adult patients having surgery, 2005



Source: Centers for Medicare & Medicaid Services, Quality Improvement Organization Program, 2005.

Key: Above average = appropriate timing of prophylactic antibiotics is significantly above the all States average in 2005. Below average = appropriate timing of prophylactic antibiotics is significantly below the all States average in 2005.

Denominator: Hospitalized patients having surgery.

Note: "All States average" is the average of all responding States (52 in this case, including the District of Columbia and Puerto Rico), which is a separate figure from the national average.

- Variation was seen among States in the overall timing of prophylactic antibiotics (Figure 3.3). In 2005, the all States average was 75.2% and ranged from 54.6% to 89.8%.
- Twenty-six States[i] were significantly above the all States average in 2005, with a combined average rate of 80.8%.
- Twenty States[ii] were significantly below the all States average in 2005, with a combined average rate of 67.6%.

[i] The States were Connecticut, Delaware, Illinois, Iowa, Kentucky, Maine, Massachusetts, Michigan, Missouri, Montana, Nebraska, New Jersey, New Mexico, North Carolina, North Dakota, Oklahoma, Rhode Island, South Carolina, South Dakota, Tennessee, Vermont, Virginia, Washington, West Virginia, Wisconsin, and Wyoming.

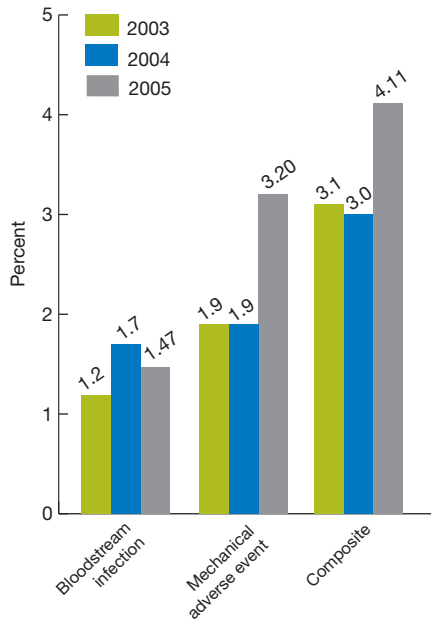
[ii] The States were Alaska, Arizona, Arkansas, California, District of Columbia, Florida, Georgia, Hawaii, Idaho, Indiana, Kansas, Louisiana, Mississippi, Nevada, New York, Ohio, Pennsylvania, Puerto Rico, Texas, and Utah.

Other Complications of Hospital Care

Besides surgery, other types of care delivered in hospitals can place patients at risk for injury or death.

Adverse events associated with central venous catheters. Patients who require a central venous catheter to be inserted into the great vessels leading to the heart tend to be severely ill. However, the placement and use of these catheters can result in infections and other complications.

Figure 3.4. Central venous catheter placements with bloodstream infection or associated mechanical adverse events among Medicare patients, overall composite and two components, 2003-2005



Source: Centers for Medicare & Medicaid Services, Medicare Patient Safety Monitoring System, 2003-2005.

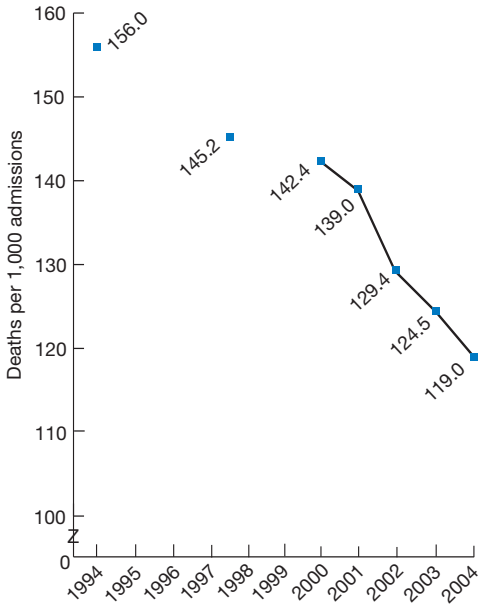
Denominator: Hospitalized Medicare patients with central venous catheter placement.

Note: Mechanical adverse events include allergic reaction, tamponade, perforation, pneumothorax, hematoma, shearing off of the catheter, air embolism, misplaced catheter, thrombosis/embolism, knotting of the pulmonary artery catheter, and certain other events.

- From 2004 to 2005, there were significant increases in the percentage of central venous catheter placements with associated complications overall (Figure 3.4).
- This increase in the composite measure is due to the significant increase in mechanical adverse events, since the rate of bloodstream infections associated with central venous catheters did not change significantly between 2004 and 2005.

Deaths following complications of care. Many complications that arise during hospital stays cannot be prevented. However, rapid identification and aggressive treatment of complications may prevent these complications from leading to death. This indicator, also called "failure to rescue," tracks deaths among patients whose hospitalizations are complicated by pneumonia, thromboembolic event, sepsis, acute renal failure, gastrointestinal bleeding or acute ulcer, shock, or cardiac arrest.

Figure 3.5. Deaths following complications of care per 1,000 admissions of adults ages 18-74, 1994, 1997, and 2000-2004



Source: Agency for Healthcare Research and Quality, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 1994-2004.

Denominator: Patients ages 18-74 years from U.S. community hospitals whose hospitalizations are complicated by pneumonia, thromboembolic event, sepsis, acute renal failure, gastrointestinal bleeding or acute ulcer, shock, or cardiac arrest.

Notes: Rates are adjusted for age, sex, diagnosis-related groups, and comorbidities. Data were analyzed for two selected historical years (1994, 1997) and annually with each NHQR (2000-2004).

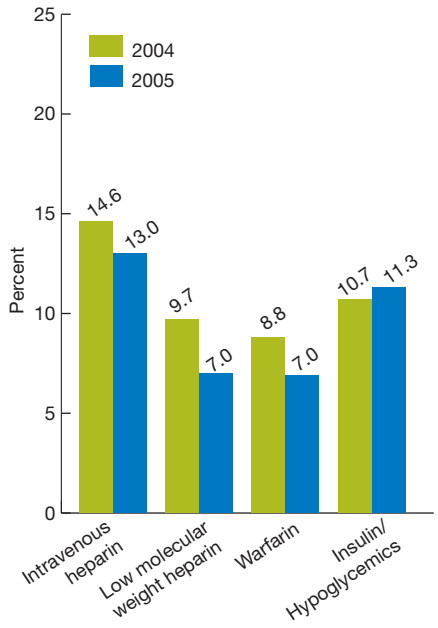
- From 1994 to 2004, the rate of deaths following complications of care declined from 156 to 119 per 1,000 admissions of adults ages 18-74 (Figure 3.5).

Complications of Medications

Complications of medications are common safety problems. Some, but not all, adverse drug events may be related to misuse of medication. However, prescribing medications that are inappropriate for a specific population may increase the risk of adverse drug events.

Adverse drug events in the hospital. Some medications used in hospitals can cause serious complications. The Medicare Patient Safety Monitoring System tracks a number of adverse drug events, including serious bleeding associated with intravenous heparin, low-molecular-weight heparin, or warfarin and hypoglycemia associated with insulin or oral hypoglycemics.

Figure 3.6. Medicare patients with adverse drug events, 2004 and 2005



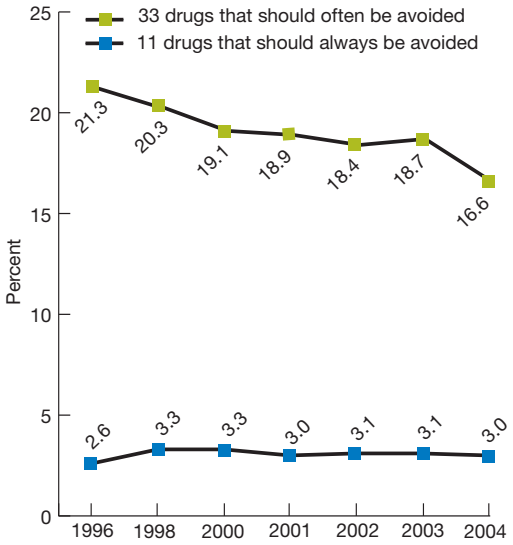
Source: Centers for Medicare & Medicaid Services, Medicare Patient Safety Monitoring System, 2004 and 2005.

Denominators: Hospitalized Medicare patients receiving specified medication.

- In 2005, adverse drug events in the hospital related to some frequently used medications ranged from 6.89% of Medicare patients who received warfarin to 13.0% of Medicare patients who received intravenous heparin (Figure 3.6).
- The rates of adverse events associated with low-molecular-weight heparin and warfarin decreased significantly between 2004 and 2005.

Inappropriate medication use among the elderly. Some drugs are considered potentially harmful for elderly patients but nevertheless were prescribed to them.[iii, 4]

Figure 3.7. Inappropriate medication use by the elderly, 1996-2004



Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 1996-2004.

Reference population: Civilian noninstitutionalized population age 65 and over.

- From 1996 to 2004, the percentage of elderly Americans who reported using at least one inappropriate drug decreased significantly, from 21.3% to 16.6 % (Figure 3.7).
- The use of drugs that should always be avoided remained relatively stable over the 1996-2004 time period at about 3%.

[iii] Drugs that should always be avoided for elderly patients include barbiturates, flurazepam, meprobamate, chlorpropamide, meperidine, pentazocine, trimethobenzamide, belladonna alkaloids, dicyclomine, hyoscyamine, and propantheline. Drugs that should often be avoided for elderly patients include carisoprodol, chlorzoxazone, cyclobenzaprine, metaxalone, methocarbamol, amitriptyline, chlordiazepoxide, diazepam, doxepin, indomethacin, dipyridamole, ticlopidine, methyldopa, reserpine, disopyramide, oxybutynin, chlorpheniramine, cyproheptadine, diphenhydramine, hydroxyzine, promethazine, and propoxyphene.

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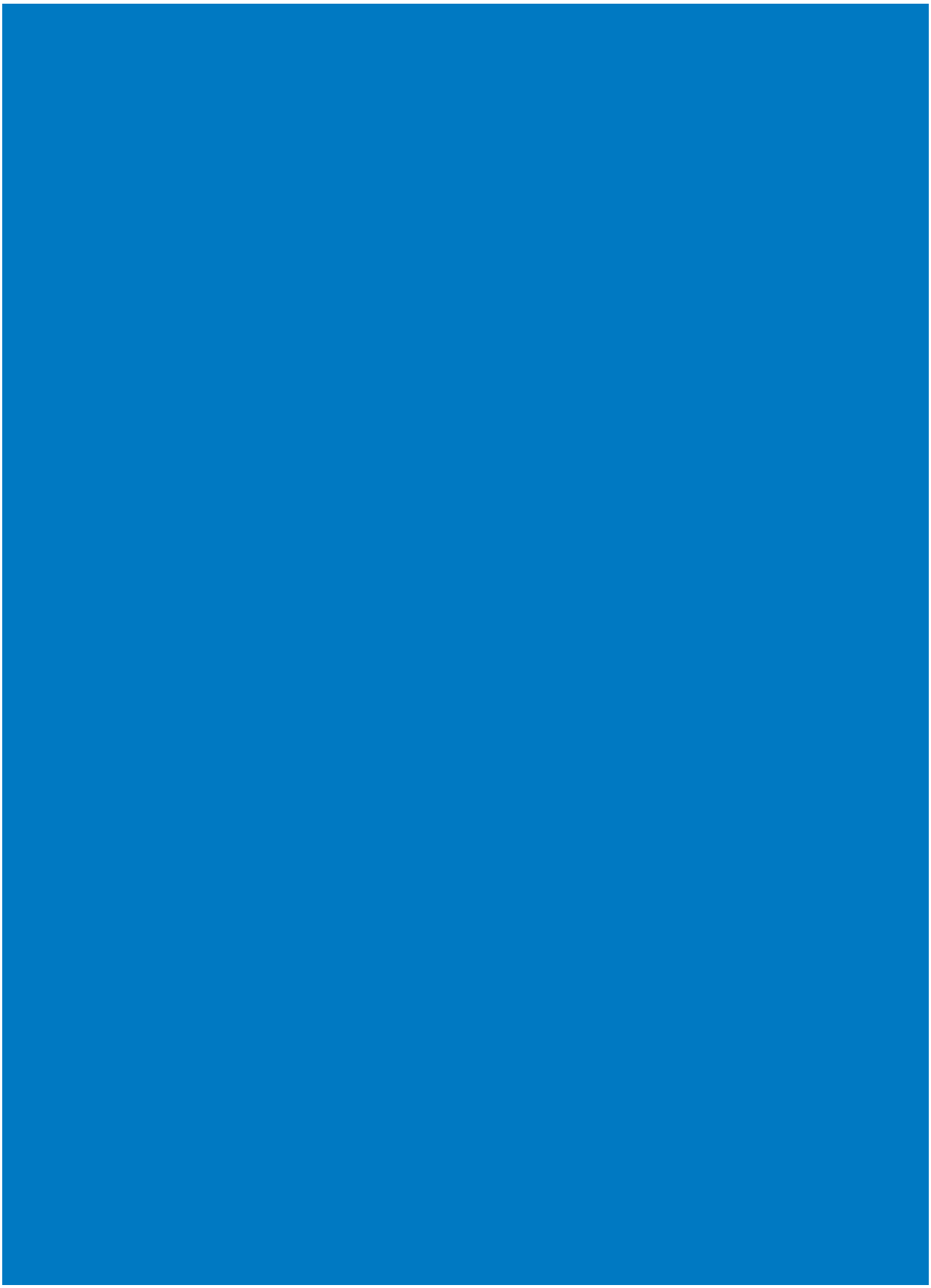


Chapter 4. Timeliness

Timeliness is the health care system's capacity to provide health care quickly after a need is recognized. Timeliness is one of the six dimensions of quality established by the Institute of Medicine as a priority for improvement in the health care system.[1] Measures of timeliness include waiting time spent in doctors' offices and emergency departments (EDs) and the interval between identifying a need for specific tests and treatments and actually receiving those services.

Importance and Measures

Morbidity and Mortality

- Lack of timeliness can result in emotional distress, physical harm, and higher treatment costs for patients.[2, 3]
- Stroke patients' mortality and long-term disability are largely influenced by the timeliness of therapy.[4, 5]
- Timely delivery of appropriate care can also help reduce mortality and morbidity for chronic conditions such as chronic kidney disease.[6]
- Timeliness in childhood immunizations helps maximize the protection from vaccine-preventable diseases, while minimizing risks to the child and reducing the chance of disease outbreaks.[7]
- Timely antibiotic treatments are associated with improved clinical outcomes.[8]

Cost

- Early care for comorbid conditions has been shown to reduce hospitalization rates and costs for Medicare beneficiaries.[9]
- Some research suggests that, over the course of 30 years, the costs of treating diabetic complications can approach $50,000 per patient.[10] Early care for complications in patients with diabetes can reduce overall costs of the disease.[11]
- Timely outpatient care can reduce admissions for pediatric asthma, which in 2003 accounted for more than $1.25 billion in total hospitalization charges.[12, 13]

Measures

This report focuses on three core report measures related to timeliness of primary, emergency, and hospital care:

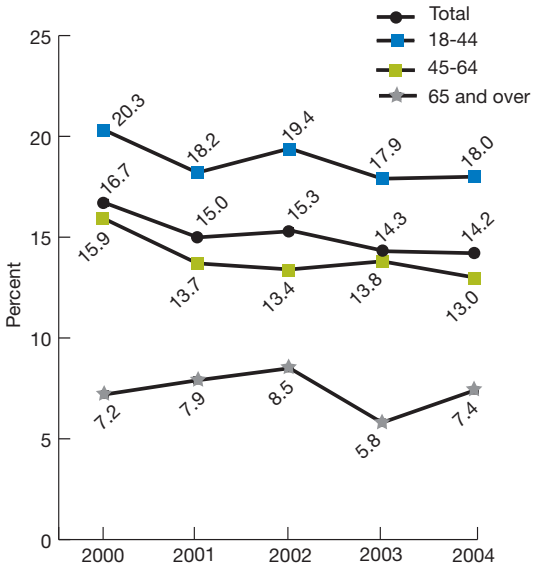
- Getting care for illness or injury as soon as wanted.
- Emergency department visits in which the patient left without being seen.
- Time to initiation of thrombolytic therapy for heart attack patients.

Findings

Getting Care for Illness or Injury As Soon As Wanted

A patient's primary care provider should be the point of first contact for most illnesses and injuries. The ability of patients to receive treatment for illness and injury in a timely fashion is a key element in a patient-focused health care system.

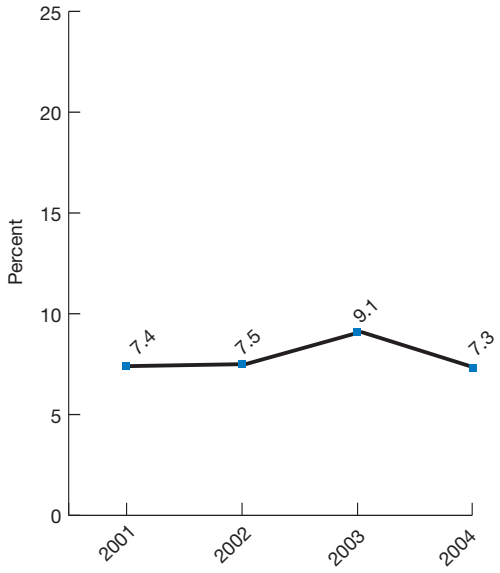
Figure 4.1. Adults who reported sometimes or never getting care for illness or injury as soon as wanted in the last 12 months, by age group, 2000-2004



Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2000-2004.

Reference population: Civilian noninstitutionalized population age 18 and over.

Figure 4.2. Children whose parents reported that they sometimes or never got care for illness or injury as soon as wanted in the last 12 months, 2001-2004



Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2001-2004.

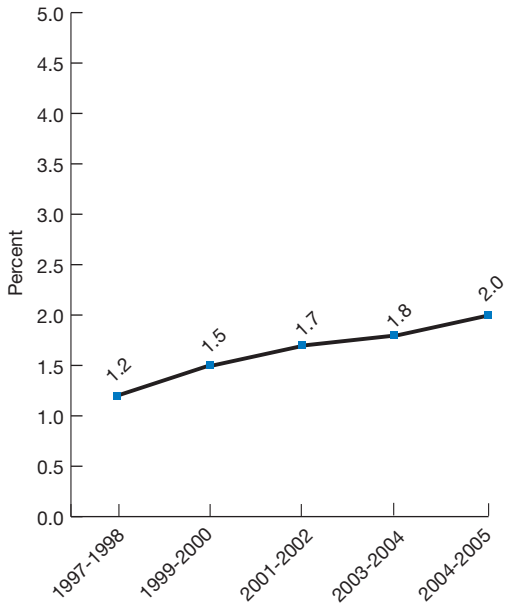
Reference population: Civilian noninstitutionalized population under age 18.

- From 2000 to 2004, the percentage of adults who reported that they sometimes or never got care for illness or injury as soon as wanted in the last 12 months improved overall, decreasing from 16.7% to 14.2% (Figure 4.1). Adults ages 45-64 were the only age subgroup for which a modest improvement was observed in this measure between 2000 and 2004 (15.9% to 13.0%).
- In all five data years, the proportion of adults who reported that they sometimes or never got care for illness or injury as soon as wanted was lower among those ages 45-64 and age 65 and older than those ages 18-44.
- Among children who had appointments reported for illness or injury during the last 12 months, 7.3% sometimes or never got care as soon as wanted in 2004 (Figure 4.2). This rate did not improve between 2001 and 2004.
- From 2001 to 2004, there was no significant difference on this measure between children under age 6 and children ages 6-17 (data not shown).

Emergency Department Visits in Which the Patient Left Without Being Seen

In 2004, patients visiting emergency departments (EDs) in the United States spent an average of 47.4 minutes waiting to be seen by a physician. This may be a result of the 18% increase in ED visit volumes over a 10-year period as the number of ED facilities decreased by 12.4%.[14] Although many factors may lead a patient seeking care in a hospital ED to leave without being seen, long waits tend to exacerbate this problem.

Figure 4.3. Emergency department (ED) visits in which the patient left without being seen, 1997-1998, 1999-2000, 2001-2002, 2003-2004, and 2004-2005



Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Hospital Ambulatory Medical Care Survey, 1997-1998, 1999-2000, 2001-2002, 2003-2004, and 2004-2005.

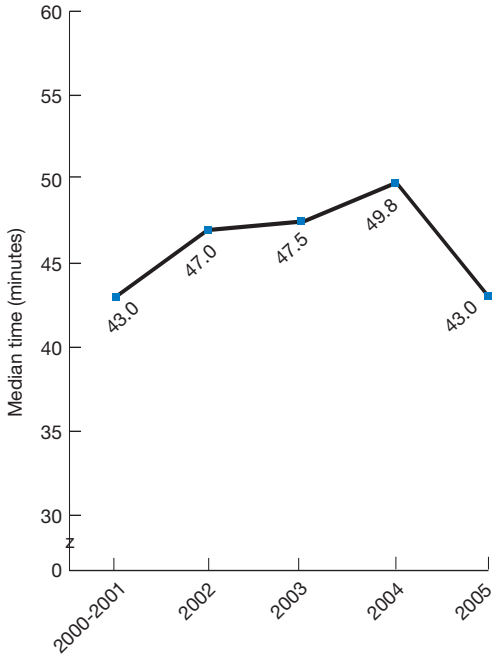
Denominator: Visits to EDs of general and short-stay hospitals.

- From 1997-1998 to 2004-2005, the overall percentage of ED visits in which the patient left before being seen increased from 1.2% to 2.0% (Figure 4.3).

Time to Initiation of Thrombolytic Therapy for Heart Attack Patients

The capacity to treat hospital patients in a timely fashion is especially important for emergency situations such as heart attacks. For patients suffering from a heart attack, early interventions—such as percutaneous coronary stenting and thrombolytic therapy—may reduce heart muscle damage and save lives.[15]

Figure 4.4. Median time (minutes) from arrival of heart attack patients to initiation of thrombolytic therapy, 2000-2005



Source: Centers for Medicare & Medicaid Services, Quality Improvement Organization Program, 2000-2005.

Denominator: Adult patients meeting all of the following criteria: (1) principal diagnosis of acute myocardial infarction; (2) ST segment elevation or left bundle branch block on the electrocardiogram performed closest to hospital arrival time; and (3) thrombolytic therapy during the hospital stay.

Notes: Beginning in 2005, the data collection method changed from the abstraction of randomly selected medical records for Medicare beneficiaries to the receipt of hospital self-reported data for all payer types.

- Among heart attack patients, the median time from hospital arrival to the initiation of thrombolytic therapy was 43 minutes in 2005. Although this represents an improvement compared to 2004, when the rate peaked at 49.8 minutes, it is unchanged from performance in 2000-2001 (Figure 4.4).
- The median time to the initiation of therapy with thrombolytic agents remains well above the national target of 30 minutes set by the American College of Cardiology and the American Heart Association.[16]

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Chapter 5. Patient Centeredness

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] An important dimension of quality, patient centeredness "encompasses qualities of compassion, empathy, and responsiveness to the needs, values, and expressed preferences of the individual patient."[2]

Importance and Measures

Morbidity and Mortality

- Patient centered approaches to care that rely on building a provider-patient relationship, improving communication techniques, fostering a positive atmosphere, and encouraging patients to actively participate in patient-provider interactions have been shown to improve the health status of patients.[3, 4]
- A patient centered approach has been shown to lessen the symptom burden on patients.[5]
- Patient centered care encourages patients to comply with and adhere to treatment regimens.[6]
- Patient centered care can reduce the chance of misdiagnosis due to poor communication.[7]

Cost

- Patient centeredness has been shown to reduce both underuse and overuse of medical services.[8]
- Patient centeredness can reduce the strain on system resources or save money by reducing the number of diagnostic tests and referrals.[5]
- Although some studies have shown that being patient centered reduces costs and use of health service resources, others have shown that patient centeredness increases costs to providers, especially in the short run.[9]

Measures

The NHQR tracks four measures of the patient experience of care. The core report measure is a composite of these measures—patient assessments of how often their provider listened carefully to them, explained things clearly, respected what they had to say, *and* spent enough time with them.

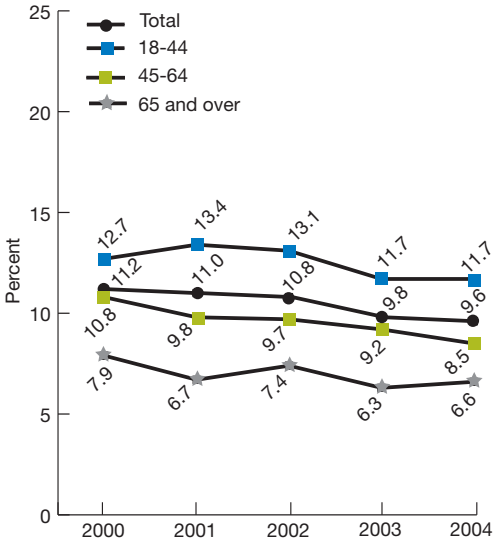
In addition, as in the 2006 NHQR, the 2007 NHQR presents four composite supplemental measures from the Hospital Consumer Assessment of Healthcare Providers and Systems (H-CAHPS), the hospital version of CAHPS®, that focus on the quality of communication that patients experience during their hospital stay. This is important not only because effective patient-provider communication can help ensure that medical decisions are consistent with the patient's needs and preferences, but also because patients can help providers avoid problems with medications and problems that may arise after they are discharged.

Findings

Patient Experience of Care—Adults

Optimal health care requires good communication between patients and providers, yet barriers to patient-provider communication are common. To provide all patients with the best possible care, providers must be able to understand patients' diverse health care needs and preferences and communicate clearly with patients about their care.

Figure 5.1. Ambulatory patients age 18 and over who reported poor communication with health providers,* by age group, 2000-2004



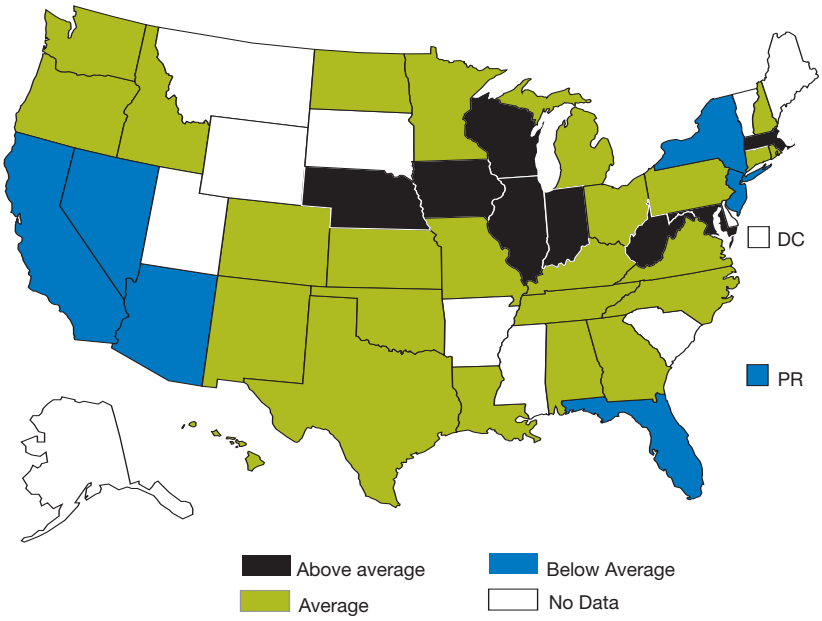
* Average percentage of adults who had a doctor's office or clinic visit in the last 12 months and reported poor communication with health providers (i.e., that their health providers *sometimes or never* listened carefully, explained things clearly, showed respect for what they had to say, and spent enough time with them).

Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2000-2004.

Denominator: Civilian noninstitutionalized population age 18 and over who visited a doctor's office or clinic to get health care in the last 12 months.

- In 2004, 9.6% of adults who had a doctor's office or clinic visit in the last 12 months reported poor communication (Figure 5.1).
- Between 2000 and 2004, the average percentage of adults with a doctor's office or clinic visit who reported poor communication decreased for the total population from 11.2% to 9.6%. Most of this improvement occurred between 2002 and 2003.
- Improvements were also seen from 2000 to 2004 for adults ages 45-64. There was no significant change in the percentages for adults ages 18-44 or 65 and over.
- In all five data years, the average percentage of adults with doctor's office or clinic visits who reported poor communication was lowest among adults 65 and over.

Figure 5.2. State variation: Ambulatory patients who reported good communication with health providers,* 2005



* Average percentage of adults who had a doctor's office or clinic visit in the last 12 months and reported good communication with health providers (i.e., that their health providers *always* listened carefully, explained things clearly, showed respect for what they had to say, and spent enough time with them).

Source: Agency for Healthcare Research and Quality, National CAHPS® Benchmarking Database.

Key: Higher rate = rate is significantly above the all States average in 2006. Lower rate = rate is significantly below the all States average in 2006.

Denominator: Adults with Medicare fee-for-service benefits who visited a doctor's office or clinic in the past 12 months.

Note: "All States average" is the average of all responding States (40 in this case, including Puerto Rico), which is a separate figure from the national average.

- In 2005, individual State scores for this composite measure[i] of communication with health providers ranged from a low (i.e., worse communication) of 60.4% to a high of 74.8%.
- In 2005, seven States[ii] were above (i.e., better communication) the all States average of 70.2% for this composite measure of communication with health providers (Figure 5.2).
- Seven States[iii] were below (i.e., worse communication) the all States average for this measure in 2005.

[i] Note that respondents were asked to choose between "sometimes," "never," "usually," or "always." In contrast to Figure 5.1, the map shown in Figure 5.2 displays results for respondents answering "always."

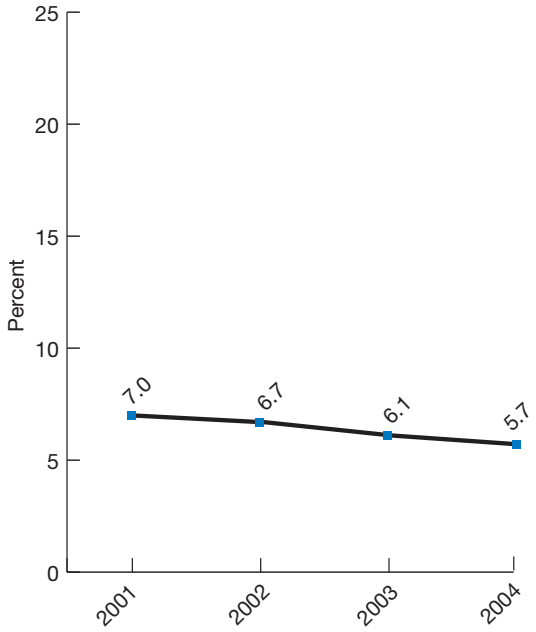
[ii] The States were Illinois, Indiana, Iowa, Massachusetts, Nebraska, West Virginia, and Wisconsin.

[iii] The States were Arizona, California, Florida, Nevada, New Jersey, New York, and Puerto Rico.

Patient Experience of Care—Children

Communication in children's health care can pose a particular challenge as children are often less able to express their health care needs and preferences, and a third party (i.e., a parent or guardian) is involved in communication and decision-making. Optimal communication in children's health care can therefore have a significant impact on receipt of high quality care and subsequent health status.

Figure 5.3. Children under age 18 with ambulatory visits whose parents reported poor communication with health providers,* 2001-2004



* Average percentage of children who had a doctor's office or clinic visit in the last 12 months and were reported to have had poor communication with health providers (i.e., that their health providers *sometimes or never* listened carefully, explained things clearly, showed respect for what they had to say, and spent enough time with them).

Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2001-2004.

Denominator: Civilian noninstitutionalized population under 18 years who visited a doctor's office or clinic to get heath care in the last 12 months.

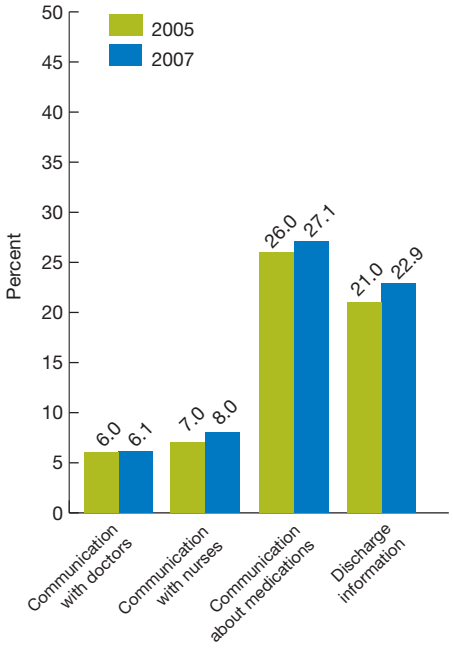
- In 2004, 5.7% of parents of children who had a doctor's office or clinic visit in the last 12 months reported poor communication with health providers. This rate, although low overall, did not improve significantly over the 2001-2004 time period (Figure 5.3).

Focus on Patient Centeredness in Hospitals

To capture information about patient perceptions of care when they are hospitalized, the Centers for Medicare & Medicaid Services and AHRQ partnered to develop a standardized instrument, the CAHPS® Hospital Survey (H-CAHPS). In 2005, 254 U.S. hospitals volunteered to use this survey. In total, completed surveys were received from 84,779 respondents with an average response rate of 44%. Although it is not nationally representative, the sample of hospitals and respondents is comparable with the national distribution of hospitals registered with the American Hospital Association.[10]

The 2007 NHQR presents four composite measures from H-CAHPS: "Communication with doctors" summarizes responses to three questions examining how often patients were treated with courtesy and respect by their doctors, how often doctors listened carefully, and how often doctors explained things in a way that patients were able to understand. "Communication with nurses" combines the same three questions in relation to nurses. "Communication about new medications" combines responses from two questions: how often hospital staff told patients the purpose of a new medicine and how often hospital staff described possible side effects in a way that patients could understand. "Discharge information" combines responses from two questions: whether hospital staff spoke with patients about whether they would have the help they needed after leaving the hospital and whether patients reported receiving written information on symptoms or health problems of which they should be aware after discharge.

Figure 5.4. Adult hospital patients who reported poor communication* with doctors, with nurses, about new medications, and about discharge information, 2005 and 2007



*Responded *"sometimes," "never,"* or *"no"* to any question in the set of survey questions for each measure.

Communication with doctors/nurses:

"During this hospital stay, how often did doctors/nurses treat you with courtesy and respect?", "During this hospital stay, how often did doctors/nurses listen carefully to you?", and "During this hospital stay, how often did doctors/nurses explain things in a way you could understand?"

Communication about new medications:

"Before giving you any new medicine, how often did hospital staff tell you what the medicine was for?" and "Before giving you any new medicine, how often did hospital staff describe possible side effects in a way you could understand?"

Discharge information:

"During this hospital stay, did doctors, nurses or other hospital staff talk with you about whether you would have the help you needed when you left the hospital?" and "During this hospital stay, did you get information in writing about what symptoms or health problems to look out for after you left the hospital?"

Source: Agency for Healthcare Research and Quality, Consumer Assessment of Healthcare Providers and Systems (CAHPS) Hospital Survey, 2005 and 2007.

Denominator: Hospital patients age 18 years and over

Notes: Data are not necessarily nationally representative. The hospitals providing data in these two periods are not the same, and the data are not adjusted for mode and patient mix, so comparisons over time must be interpreted with caution.

- Communication between hospital patients and doctors and nurses and about new medications and discharge information did not improve and, for some age groups, worsened between 2005 and 2007. During this period, the percentage of hospital patients who reported poor communication with their doctors during their stay remained relatively unchanged (Figure 5.4).
- Significantly higher (worse) percentages of hospital patients reported poor communication with nurses and about new medications and discharge information in 2007 compared with 2005 (8.0% versus 7.0%, 27.1% versus 26.0%, and 22.9% versus 21.0%, respectively).

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Chapter 6. Efficiency

Few issues within American health care policy today are as extensively debated as how to obtain better value for money. And the debate about how to improve efficiency is equally matched by the debate about how best to measure it. The existence of varying perspectives and definitions of "efficiency" in the health care marketplace and the lack of consensus on what constitutes appropriate measurement of efficiency have stymied efforts to report on this area. It is the only one of the Institute of Medicine's set of six quality aims[1] that the NHQR and NHDR have not yet addressed.

The issue of how to improve efficiency in the Nation's health care system is at the heart of the mission of Secretary Mike Leavitt and the Department of Health and Human Services to increase transparency in health care with better information on quality and cost. In support of this mission, this year's NHQR provides an initial look at potential information sources and findings on efficiency in the U.S. health care system.

The focus on efficiency in this year's NHQR is a first attempt to outline the varying perspectives on efficiency and to offer potential methods for measuring efficiency at the national level that respond to the NHQR's mandate—that is, to provide information on health care performance for lawmakers in Congress. This chapter does not attempt to provide a definitive framework for efficiency, nor does it provide an exhaustive list of potential measures of efficiency. The examples provided should be viewed as preliminary, and no conclusions about efficiency in the U.S. health care system should be drawn. Rather, the Agency for Healthcare Research and Quality (AHRQ) hopes that this chapter will stimulate further productive discussions in the area of health care efficiency. AHRQ intends this chapter to be the first in an evolving national discussion on measuring efficiency in the U.S. health care system that will be reviewed, revised, and presented in future reports.

Background and Measures

In its landmark report, *Crossing the Quality Chasm: A New Health System for the 21st Century,*[1] the Institute of Medicine (IOM) presented six "aims" for the health care system: effectiveness, safety, timeliness, patient centeredness, equity, and efficiency. AHRQ, in its reauthorization legislation of 2001, was given the task of developing two national health care reports that would track quality and prevailing disparities in the Nation's health care.

IOM provided guidance[2, 3] on the development of these two national health care reports and suggested that the framework for the reports be linked to the six aims presented in *Crossing the Quality Chasm*. At the same time, however, IOM stated that AHRQ should not try to address the issue of efficiency in the first national reports, but rather should examine its inclusion in future reports or in a stand-alone report.

With guidance from an HHS Interagency Work Group brought together to advise on the development of the reports, AHRQ developed the first NHQR and NHDR in 2003 without addressing the topic of efficiency. In 2004, the Interagency Work Group encouraged AHRQ to examine possible approaches to including efficiency in future reports. This followed advice by AHRQ's National Advisory Committee (NAC) of external experts from the private sector, academia, and the Federal sector. The NAC had, at AHRQ's request, formed a

subcommittee, led by Dr. Don Berwick, that provided advice on the NHQR and NHDR. That subcommittee recommended that AHRQ develop a chapter on efficiency for the reports.

To respond to these NAC and Interagency Work Group requests, AHRQ formed a subgroup of its Interagency Work Group in 2004 to address the issue of efficiency. This subgroup held two meetings in 2005, during which it reviewed documents from previous reports and discussed possible ways to further this effort. The subgroup concluded at that time that there was insufficient consensus on the perspective from which to conceptualize and measure efficiency.

AHRQ had previously commissioned the RAND Corporation to systematically review measures of efficiency and their potential for tracking and reporting at various levels. The efficiency subgroup, therefore, decided to wait until that report was submitted to AHRQ to develop any further plans. The final version of this recently completed report summarizes the knowledge base on efficiency measures as follows:

- Few analyses about the reliability and validity ("scientific soundness") of published and unpublished measures have been conducted.
- Both the published literature measures and the vendor measures focus on intermediate outcomes (e.g., inpatient stays), not final outcomes (e.g., functional status, measures of health).
- Consensus has yet to emerge on which approaches constitute acceptable measures of efficiency.[4]

The RAND report provides a typology of efficiency measures that emphasizes the multiple perspectives on efficiency and points out that measures must be considered from the standpoint of what the measuring organization is and what its goal is in assessing efficiency. The typology distinguishes between:

- Society as a whole (i.e., the "population" level).
- Health care firms (i.e., hospitals and other providers).
- Individuals.

Another recent (2006) report examined the question of efficiency from the point of view of the cost of waste; in that report, the authors outline another common typology for efficiency measurement—the tracking of overuse, underuse, and misuse in the health care system.[5]

This chapter first presents a general set of trends on costs and quality levels in the U.S. health care system. Then a selection of potential measures on health care efficiency is presented that summarizes information at the population and provider level. The measures used are:

- Change in expenditures and quality of care for cancer, diabetes, and heart disease (overview).
- Trends in avoiding unnecessary hospitalizations and costs (population perspective).
- Trends in hospital efficiency (provider perspective).

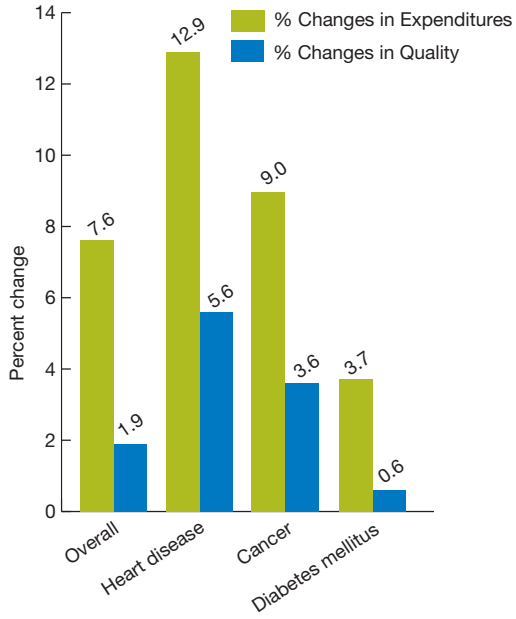
Because consensus has yet to emerge about the appropriate framework and acceptable measures of efficiency, the examples provided should be viewed as preliminary and designed to stimulate productive ongoing discussions about health care efficiency.

Findings

Change in Expenditures and Quality of Care for Cancer, Diabetes, and Heart Disease

Data from AHRQ's Medical Expenditure Panel Survey (MEPS) are used to provide a preliminary overview and to suggest possible national trends in health care cost and quality. MEPS collects health care expenditures by all payers for nearly all types of health care utilization—including outpatient visits, hospital inpatient stays, emergency department visits, prescribed medicines, dental visits, and home health care—for the civilian noninstitutionalized population. Summary data are presented here on the rate of change in total annual expenditures for all persons and for persons with three high-priority conditions—cancer, diabetes, and heart disease—from 2001 to 2004. This presentation enables comparison of rates of expenditure change with the summary measure of percent change in quality that has been presented in previous NHQRs. The data presented here are summarized in terms of the annualized percent change in the NHQR measures from 2001 to 2004 nationally for the entire measure set and for each condition area.[i]

Figure 6.1. Overall example: Average annualized percent changes in national health care expenditures and quality for all persons and persons with selected conditions, 2001-2004



Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2001 and 2004. See Measure Specifications Appendix for list of measures included in each category.

Reference population: Civilian noninstitutionalized population.

Note: Average annualized percent change in total expenditures adjusted for inflation using the Gross Domestic Product implicit price deflator (Bureau of Economic Analysis).

[i] This annualized percent change is the same metric as is used in the Highlights section of this report and is explained in detail in Chapter 1, Introduction and Methods. A list of the measures used for these calculations is available in the NHQR Measure Specifications Appendix.

- From 2001 to 2004, total annual health care expenditures have been increasing at a rate that is four times the rate of the increase in the summary measure of quality of care. Annual total health care expenditures rose 7.6% (in 2004 dollars).[ii] During this same time period, quality increased at a rate of 1.9%.
- For heart disease, cancer, and diabetes individually, quality increased at a rate of 5.6%, 3.6%, and 0.6% annually. Expenditures increased at an annual rate of 12.9%, 9.0%, and 3.7%, respectively (Figure 6.1).

Figure 6.1 may seem to suggest that improvements in overall quality are outpaced by increases in expenditures. However, such a conclusion cannot be drawn and the statistics should be viewed with caution, as these are comparisons of percent changes of two very different measures. First, expenditures are comprehensively measured, but quality is not. Figure 6.1 presents a summary of all available quality measures in this report, rather than a catalog of all clinical care for all conditions and patients. The quality measures track both processes of care and outcomes of care. The indicators selected for inclusion in the NHQR/DR measure set are considered the most scientifically sound and clinically important markers of whether we are achieving appropriate performance in health care. However, many aspects of care are not captured in these indicators of quality. A comprehensive assessment may never be feasible, as technical aspects of care are changing more rapidly than can be captured through broad, consensus-based quality measurement vehicles such as the NHQR. Moreover, it would be difficult to collect measures of quality for rare conditions. In addition, the summary measure of quality is composed of measures calculated on a per person basis, but total annual expenditures increase in part due to population growth. Finally, these statistics are provided without estimates of variability (i.e., without confidence intervals). Statistical testing for these sorts of comparisons is complex, and future versions of the NHQR will examine more refinements to such statistical testing.[iii]

The statistics illustrated above suggest many questions about efficiency. They are not provided to suggest causation between costs and quality. Providing higher quality care may cost more than providing lower quality care, and achieving increasingly higher quality goals may require even higher expenditures to reach an additional person. Some types of quality care might reduce expenditures, particularly by reducing hospitalizations. Furthermore, the factors that caused the changes in expenditures may be different from the factors that caused improvement in quality. More research is needed to investigate these issues.

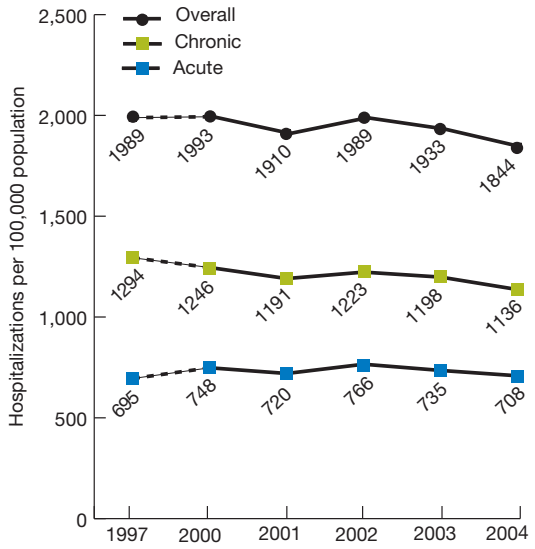
[ii] Expenditures in 2001 were adjusted to 2004 dollars using the Gross Domestic Product implicit price deflator.

[iii] The creation of confidence intervals for expenditures using MEPS data is possible and was conducted for this analysis. The estimates with their confidence intervals are: (a) heart disease 12.9% (3.7–22.1); (b) cancer 9.0% (-2.4–20.4); and (c) diabetes 3.7% (-4.2–11.6).

Trends in Avoiding Potentially Unnecessary Hospitalizations and Costs

To address the population perspective of avoiding potentially unnecessary hospitalizations and costs, data on ambulatory-care-sensitive conditions are summarized here using the AHRQ Prevention Quality Indicators (PQIs). While not every one of the hospitalizations tracked by the AHRQ PQIs is preventable, ambulatory-care-sensitive conditions are those for which good outpatient care can prevent the need for hospitalization or for which early intervention can prevent complications or more severe disease.[6] The AHRQ PQIs track these conditions using hospital discharge data. For this analysis, total hospital charges were converted to costs using Healthcare Cost and Utilization Project (HCUP)[iv] cost-to-charge ratios based on hospital accounting reports from the Centers for Medicare & Medicaid Services.

Figure 6.2. Population example: National trends in potentially avoidable hospitalization rates, by type of hospitalization, 1997 and 2000-2004

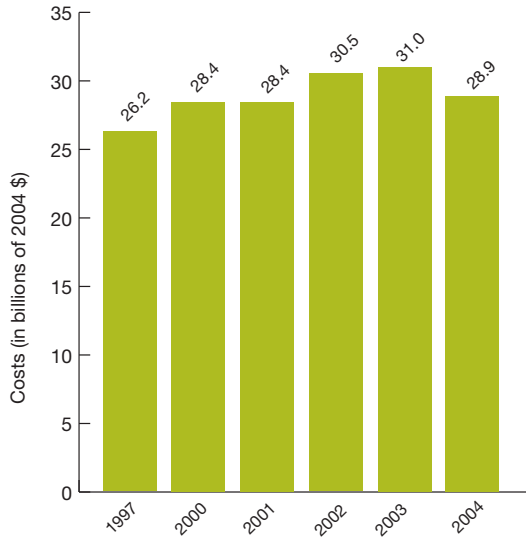


Source: Agency for Healthcare Research and Quality, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 1997 and 2000-2004.

Note: Data are for adults age 18 and over.

[iv] The Healthcare Cost and Utilization Project (HCUP) is a family of health care databases and related software tools and products developed through a Federal-State-industry partnership and sponsored by AHRQ. Additional information is provided in the NHQR Measure Specifications Appendix in the "Data Sources" section.

Figure 6.3 Population example: Total national costs associated with potentially avoidable hospitalizations, 1997 and 2000-2004



Source: Agency for Healthcare Research and Quality, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 1997 and 2000-2004.

Note: Data are for adults age 18 and over.

- Avoidable hospitalization rates have decreased gradually but significantly between 1997 and 2004 (Figure 6.2). Overall, Americans were hospitalized for conditions that can be effectively managed in the outpatient setting 7.75% less frequently in 2004 than in 1997 (1,989 hospitalizations per 100,000 in 1997 versus 1,844 hospitalizations per 100,000 in 2004).
- Avoidable hospitalizations are more frequent for chronic conditions. However, avoidable hospitalizations for acute conditions have slightly increased since 1997 (695 per 100,000 in 1997 versus 708 per 100,000 in 2004).
- Although avoidable hospitalization rates have decreased overall since 1997, total national hospital costs associated with avoidable hospitalizations have increased since 1997 (Figure 6.3). Avoidable hospitalizations cost the Nation's health care system nearly $29 billion in 2004, which was 10% greater than what they cost in 1997 when adjusted for inflation ($26.2 billion).[v]

These figures provide some preliminary measures of the potential for improvement in one dimension of efficiency.

[v] The inflation adjustment was done based on the change in Gross Domestic Product.

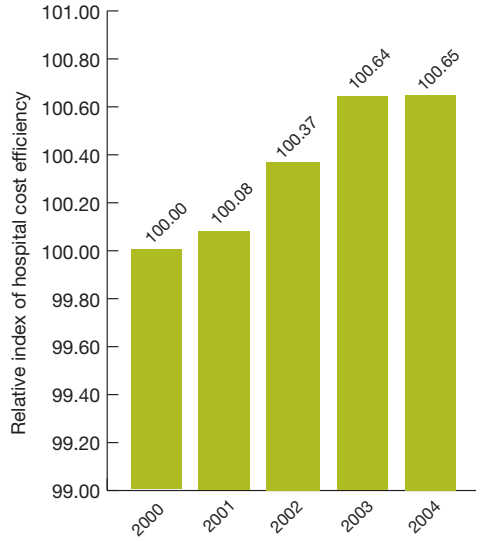
Trends in Hospital Efficiency

Significant attention has been paid to cost variations across providers and across the country. Yet it is often difficult to separate out costs due to differences among providers in outputs, casemix, or quality of care. To address the provider perspective, hospital cost efficiency is examined using a technique from the field of econometrics that can account for such differences.[vi] This analysis uses data from the American Hospital Association Annual Survey, the Medicare Cost Reports, and quality indicators from the application of the AHRQ Quality Indicator software to data from the Healthcare Cost and Utilization Project.

Here, the efficiency of a hospital is defined as the ratio of best-practice costs to total observed costs. For example, given the types and quantities of outputs a hospital produces, the input prices it pays, its casemix, its quality, and the characteristics of its market, a theoretical best-practice hospital might incur expenses amounting to $90 million. A comparison hospital in an identical situation with total expenses of $100 million would have an estimated cost efficiency of 90%.

Cost efficiency estimates have been converted to index numbers with a base of 100 for the year 2000 as a way to place less emphasis on the specific magnitude of estimated cost efficiency than on its general trend.

Figure 6.4. Provider example: Average estimated relative hospital cost efficiency index for a selected sample of urban general, community hospitals, 2000-2004



Source: Agency for Healthcare Research and Quality. Analysis based on 1,266 urban general, community hospitals with data in the Healthcare Cost and Utilization Project, State Inpatient Databases. See Chapter 1, Introduction and Methods, for further details.

[vi] Stochastic frontier analysis (SFA) is the technique that is used in this analysis. SFA can estimate best-practice costs as the value total costs would be if full efficiency were attained. The hospital-level "cost efficiency" estimates produced by SFA measure whether output is obtained using the fewest inputs (i.e., technical efficiency), as well as whether output is produced using the optimal mix of inputs, given prices (i.e., allocative efficiency), the size of a hospital's operations (i.e., scale efficiency), and the range of a hospital's operations (i.e., scope efficiency), including possible overspecialization or overdiversification.[7]

- Estimated urban hospital cost efficiency increased slightly from 2000 to 2004 for a selected sample of urban general, community hospitals (Figure 6.4).
- The most cost-efficient hospitals (i.e., hospitals in the highest quartile of estimated cost efficiency) compared favorably with the least cost-efficient hospitals (i.e., hospitals in the lowest quartile of estimated cost efficiency) on a number of important variables. Cost-efficient hospitals had lower costs and fewer full-time equivalent employees per casemix-adjusted admission, as well as a shorter average length of stay (Table 6.1).
- The most cost-efficient hospitals had a higher operating margin than the least cost-efficient hospitals (Table 6.1).

Table 6.1. Provider example: Correlates of hospital cost efficiency

Measure	Estimate	Standard deviation
Cost per casemix-adjusted admission:		
Top quartile of hospital cost efficiency	$4,224.55	$1,212.55
Bottom quartile of hospital cost efficiency	$6,345.03	$2,652.23
Full-time equivalent employees per casemix-adjusted admission:		
Top quartile of hospital cost efficiency	0.042673	0.013120
Bottom quartile of hospital cost efficiency	0.057556	0.022444
Average length of stay (days):		
Top quartile of hospital cost efficiency	5.45	2.36
Bottom quartile of hospital cost efficiency	5.76	3.59
Operating margin:		
Top quartile of hospital cost efficiency	0.0123	0.1314
Bottom quartile of hospital cost efficiency	-0.0946	0.2603

It is important to note that the figures reported above are not national estimates and that no conclusions about national trends should be inferred. However, the hospitals in the analysis represent about 52% of all urban general, community hospitals and therefore provide an indication of the general trend that cost efficiency may be following.

Next Steps on Efficiency Reporting

These brief examinations of efficiency clearly show that a significant amount of information about the study of efficiency and its measurement is not fully developed. In part, this is because the relationship between quality and efficiency is not straightforward. Past work examining variations in Medicare spending and its relationship to quality has shown clearly that higher cost providers do not necessarily provide higher quality care.[8] The preliminary examination of efficiency in this chapter is only a first step. Tracking efficiency in the health care system over the long term will require ongoing and future efforts to improve the specificity of quality measures, as well as efficiency measures.

A number of major efforts are underway within both the public and private sectors in the U.S. health care system to advance our knowledge of efficiency. Since 2006, the National Committee on Quality Assurance (NCQA) has published measures of resource utilization for use in conjunction with quality measures for six chronic care conditions. Other private sector organizations, such as the Bridges to Excellence Program, the Leapfrog Group, and the Commonwealth Fund, have been active in supporting efforts to examine improved provider reporting on efficiency. Most recently, the National Quality Forum (NQF), as part of its Priority

Setting Project, has developed a framework for efficiency measurement. The framework acknowledges the multiple perspectives on efficiency but concludes that the patient's perspective should be the focus of future work. This necessitates a focus across episodes of care, which presents distinct challenges from a data perspective. Current national data systems are extremely limited in their ability to produce the data needed to satisfy criteria developed for the NQF's efficiency framework. However, AHRQ plans to work closely with its Federal and private sector partners to develop the efficiency reporting in the NHQR to include, where possible, cross-episode accounting of efficiency.

One of the primary areas on which AHRQ and its HHS partners will be concentrating in the realm of improving efficiency measurement is the Secretary's Value-Driven Health Care Initiative. The Value-Driven Health Care Initiative is an effort by HHS Secretary Mike Leavitt and HHS to provide public information about the quality and cost of services delivered by health care providers. Such information is not widely available today. There is little information to help consumers compare doctors and hospitals based on measures of quality and cost. Providers themselves have limited information for comparing their performance based on accepted standards of care. Yet such information is crucial for delivering the best treatment and the best value in health care. As part of the initiative, volunteer participants commit to four objectives, called the "cornerstones" of value-driven health care. One of the cornerstones is "Reporting on Quality," whereby participants commit to public reporting on the performance of doctors, hospitals, and other providers. For more information about the Value-Driven Health Care Initiative, go to: http://www.hhs.gov/valuedriven/.

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List of Core Report Measures

Measure	Measure number 2007	Year of most recent data	National estimate	National database	State database
EFFECTIVENESS OF CARE					
CANCER					
Screening for breast cancer:					
Women age 40 and over who reported they had a mammogram within the past 2 years (percent)	1.1	2005	66.6	NHIS	BRFSS
Rate of breast cancer incidence per 100,000 women age 40 and over diagnosed at advanced stage (regional, distant stage, or local stage w/tumor greater than 2 cm)	1.2	2004	92.8	SEER	NPCR
Cancer treatment:					
Breast cancer deaths per 100,000 female population per year	1.11	2004	24.4	NVSS-M	NVSS-M
DIABETES					
Management of diabetes:					
Composite measure: Percent of adults age 40 and over with diagnosed diabetes who had all three exams in the past year: hemoglobin A1c test, a retinal eye examination, and a foot examination	1.16	2004	46.7	MEPS	BRFSS
Hospital admissions for lower extremity amputations per 1,000 adult patients with diabetes	1.28	2003-2005	4.1	NHDS	HCUP SID
END STAGE RENAL DISEASE					
Management of end stage renal disease:					
Percent of dialysis patients registered on the waiting list for transplantation	1.33	2003	15.0	USRDS	USRDS
Percent of hemodialysis patients with urea reduction ratio 65% or higher	1.35	2005	88	ESRD Clinical Performance Measures Project	U.Michigan

Measure	Measure number 2007	Year of most recent data	National estimate	National database	State database
HEART DISEASE					
Counseling on risk factors:					
Percent of smokers receiving advice to quit smoking	1.41	2004	63.7	MEPS	BRFSS
Percent of obese adults age 18 and older who were given advice about exercise	1.63	2004	58.8	MEPS	n.a.
Treatment of acute myocardial infarction (AMI):					
Composite measure: Percent of adult patients who received recommended hospital care for heart attack	1.42	2005	93.5	QIO	QIO+HC
Treatment of acute heart failure:					
Composite measure: Percent of adult patients who received recommended hospital care for heart failure	1.51	2005	86.9	QIO	QIO+HC
Heart disease treatment:					
Deaths per 1,000 adult admissions with acute myocardial infarction	1.60	2004	81.7	HCUP NIS	n.a.
HIV and AIDS					
AIDS prevention:					
New AIDS cases per 100,000 population age 13 and over	1.65	2005	18.1	CDC AIDS	n.a.
MATERNAL AND CHILD HEALTH					
Maternity care:					
Percent of pregnant women receiving prenatal care in first trimester	1.72	2004	83.9	NVSS-N	NVSS-N
Infant mortality per 1,000 live births, birthweight <1,500 grams	1.74	2004	244.5	NVSS-I	NVSS-I
Immunization, childhood:					
Percent of children 19-35 months who received all recommended vaccines	1.76	2005	80.8	NIS	NIS

Measure	Measure number 2007	Year of most recent data	National estimate	National database	State database
Treatment of pediatric gastroenteritis:					
Hospital admissions for pediatric gastroenteritis per 100,000 population less than 18 years of age	1.77	2004	178.7	HCUP NIS	HCUP SID
Childhood preventive care:					
Percent of children age 2-17 for whom a doctor or other health provider gave advice about healthy eating	1.80	2004	53.3	MEPS	n.a.
Percent of children age 2-17 with a dental visit in the past year	1.81	2004	51.6	MEPS	n.a.
MENTAL HEALTH AND SUBSTANCE ABUSE					
Treatment of depression:					
Deaths due to suicide per 100,000 population	1.91	2004	10.9	NVSS-M	NVSS-M
Percent of adults age 18-64 with past year major depressive episode who received treatment for the depression in the past year	1.92	2005	65.6	SAMHSA	n.a.
Treatment of substance abuse:					
Percent of persons age 12 or older who needed treatment for any illicit drug use and who received such treatment at a specialty facility in the past year	1.94	2005	17.0	SAMHSA-NSDUH	n.a.
Percent of persons age 12 or older who received substance abuse treatment who completed treatment course	1.95	2004	44.2	TEDS	n.a.
RESPIRATORY DISEASES					
Immunization, pneumonia:					
Percent of persons age 65 and over who ever received a pneumococcal vaccination	1.100	2005	56.3	NHIS	BRFSS
Treatment of pneumonia:					
Composite measure: Percent of adult patients who received recommended hospital care for pneumonia	1.101	2005	74.1	QIO	QIO

Measure	Measure number 2007	Year of most recent data	National estimate	National database	State database
Treatment of upper respiratory infection (URI):					
Visit rates where antibiotics were prescribed for a diagnosis of common cold per 10,000 population	1.108	2004-2005	137	NAMCS-NHAMCS-	n.a.
Management of asthma:					
Hospital admissions for pediatric asthma per 100,000 population age 2-17	1.110	2004	155.5	HCUP NIS	HCUP SID
Treatment of TB:					
Percent of patients who complete a curative course of TB treatment within 12 months of initiation of treatment	1.113	2003	81.5	CDC TB	n.a.
NURSING HOME, HOME HEALTH, AND HOSPICE CARE					
Nursing facility care:					
Percent of long-stay residents who were physically restrained	1.116	2005	6.6	CMS MDS	CMS MDS
Percent of high-risk residents who have pressure sores	1.121	2005	13.1	CMS MDS	CMS MDS
Percent of short-stay residents with pressure sores	1.127	2005	20.7	CMS MDS	CMS MDS
Home health care:					
Percent of home health care patients who get better at walking or moving around	1.136	2005	38.8	CMS OASIS	CMS OASIS
Percent of home health care patients who had to be admitted to the hospital	1.140	2005	28.0	CMS OASIS	CMS OASIS

Measure	Measure number 2007	Year of most recent data	National estimate	National database	State database
PATIENT SAFETY					
Postoperative complications:					
Composite measure: Surgical patients with postoperative pneumonia, urinary tract infection, and venous thromboembolic event (percent)	2.1	2005	6.55	MPSMS	n.a.
Composite measure: Appropriate timing of antibiotics received by adult Medicare patients having surgery (percent)	2.5	2005	75.2	QIO	QIO+HC
Composite measure: Complications of central venous catheters (percent)	2.18	2005	4.1	MPSMS	n.a.
Complications of medication:					
Percent of community dwelling elderly who had at least 1 prescription (from a list of 11 medications and from a list of 33 medications) potentially inappropriate for the elderly	2.35	2005	16.6	MEPS	n.a.
TIMELINESS					
Getting appointments for care:					
Percent of adults age 18 and over who reported sometimes or never getting care for illness or injury as soon as wanted	2.35	2004	14.2	MEPS	NCBD
Waiting time: Percent of emergency department (ED) visits in which the patient left before being seen	3.11	2004-2005	2.0	NAMCS-NHAMCS	n.a.
PATIENT CENTEREDNESS					
Patient experience of care:					
Composite measure: Percent of adults whose health providers sometimes or never listened carefully, explained things, showed respect, and spent enough time with them	4.1	2004	9.6	MEPS	NCBD
Composite measure: Percent of children whose health providers sometimes or never listened carefully, explained things, showed respect, and spent enough time with them	4.2	2004	5.7	MEPS	NCBD

Key to abbreviations:

AHRQ-QI = AHRQ Quality Indicators
BRFSS = Behavioral Risk Factor Surveillance System
CDC AIDS = Centers for Disease Control and Prevention HIV/AIDS Surveillance System
CDC TB = Centers for Disease Control and Prevention National Tuberculosis Surveillance System
CMS = Centers for Medicare & Medicaid Services
CMS OASIS = Centers for Medicare & Medicaid Services Outcome and Assessment Information Set
HCUP NIS = Healthcare Cost and Utilization Project Nationwide Inpatient Sample
HCUP SID = Healthcare Cost and Utilization Project State Inpatient Databases
HP2010 = Healthy People 2010
ESRD = End Stage Renal Disease
MEPS = Medical Expenditure Panel Survey
MPSMS = Medicare Patient Safety Monitoring System
MDS = Minimum Data Set
NAMCS-NHAMCS = National Ambulatory Medical Care Survey-National Hospital Ambulatory Medical Care Survey
NCBD = National CAHPS® Benchmarking Database
NCQA = National Committee for Quality Assurance HEDIS® measure set
NHDS = National Hospital Discharge Survey
NHIS = National Health Interview Survey
NIS = National Immunization Survey
NNIS = National Nosocomial Infections Surveillance
NPCR = National Program of Cancer Registries
NSDUH = National Survey on Drug Use and Health
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
OASIS = Outcome and Assessment Information Set
QIO = Quality Improvement Organization program
QIO+HC = Quality Improvement Organization program + Hospital Compare
SAMSHA = Substance Abuse and Mental Health Services Administration
SEER = Surveillance, Epidemiology, and End Results Program
TEDS = Treatment Episode Data Set
USRDS = United States Renal Data System
U.Michigan = University of Michigan Kidney Epidemiology and Cost Center
n.a. = Not applicable

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