

2005

National
Healthcare
Quality
Report



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**U.S. Department of
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Key Themes and Highlights From the National Healthcare Quality Report

The National Healthcare Quality Report (NHQR) is a comprehensive national overview of the quality of health care in the United States. It is a companion report to the National Healthcare Disparities Report (NHDR), which is a comprehensive national overview of disparities in health care affecting racial, ethnic, and socioeconomic groups and priority populations. The 2005 NHQR presents the third annual opportunity to measure the Nation's health care quality and to track trends over time—the primary intent of Congress's mandate to the Agency for Healthcare Research and Quality (AHRQ) to produce the NHQR.

The NHQR is built on 179 measures assembled 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 46 “core” report measures which represent the most important and scientifically credible measures of quality for the Nation, as selected by the Department of Health and Human Services (HHS) Interagency Work Group.ⁱ The distillation of 46 core measures for the 2005 report provides a more readily understandable summary and explanation of the key results derived from the data.ⁱⁱ Also included in the report are four new composite measures, which summarize data from a collection of individual measures. Composite measures were created for heart attack, heart failure, pneumonia, and patient centered care, in addition to an overall measure of the state of health care quality improvement.

Four themes that emerge from the 2005 NHQR extend the meaning of those from the 2003 and 2004 reports and add new dimensions on understanding change over time:

- Health care quality continues to improve at a modest pace across most measures of quality.
- Health care quality improvement is variable, with notable areas of high performance.
- Health care quality is improving, but more remains to be done to achieve optimal quality.
- Sustained rates of quality improvement are possible.

ⁱThe HHS Interagency Work Group, which represents 18 HHS agencies and offices, was formed to provide advice and support to the report team.

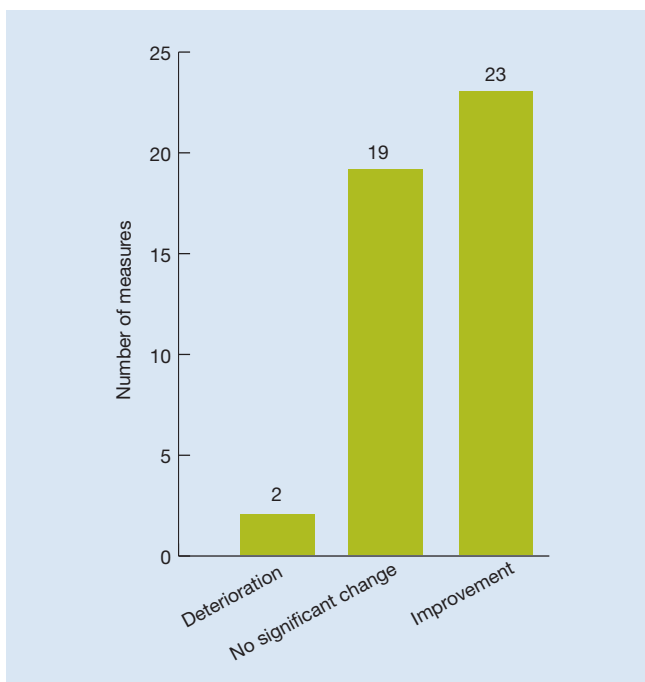
ⁱⁱData on all NHQR measures are available in the Data Tables Appendix at www.qualitytools.ahrq.gov.

Health Care Quality Continues To Improve at a Modest Pace Across Most Measures of Quality

Most measures of quality demonstrate improvement over the 2004 NHQR:

- Of the 44 core report measures with trend data, 23 showed significantⁱⁱⁱ improvement, 2 showed significant deterioration, and 19 stayed the same (Figure H.1).
- Measures that improved significantly outnumbered those that deteriorated significantly by a large margin of over 10 to 1.
- A sizable percentage of the measures (43%) showed no significant change.

Figure H.1. Number of NHQR core measures showing significant improvement, no significant change, or deterioration over multiple years (n=44)



Note: The average annual improvement for each measure is reported here. For trend analyses of the core measures in this report, 3 years of data are presented; for a few, only 2 years are shown; and for others, more than 3 years are presented.

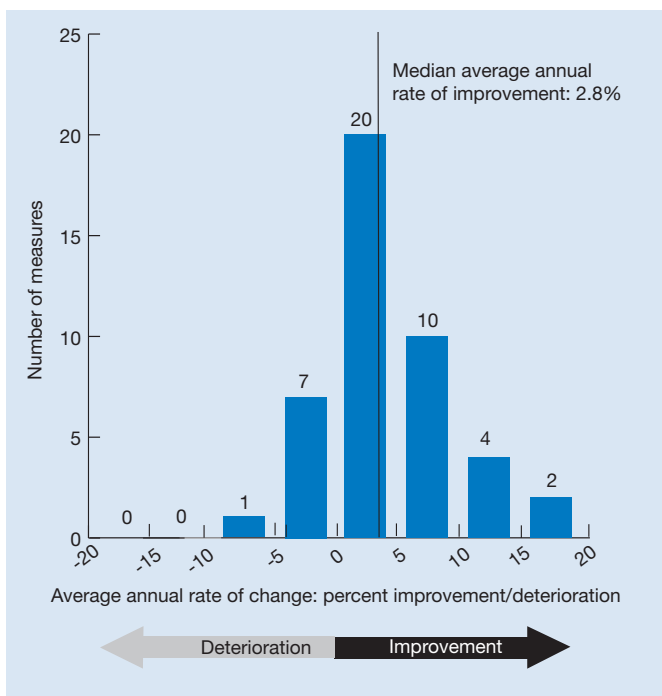
ⁱⁱⁱSignificance is defined as a statistical difference with a p value less than 0.05 and with an average change of 1% or more per year over a period of 2 or more years, depending on the measure. For more detail, see Chapter 1, Introduction and Methods.

Highlights

However, the pace of improvement overall is modest. Of the 44 core report measures with trend data:

- The frequency distribution of the average annual rate of change for all core measures is skewed toward improvement such that there were 36 measures that showed some improvement (significant and not significant) and 8 that deteriorated (Figure H.2).
- The median rate of annual change for the 44 core measures is a 2.8% improvement. This is the same rate of improvement as reported in the 2004 NHQR.^{iv}
- Six measures showed annual improvement of more than 10% whereas no measure showed deterioration of greater than 10%.

Figure H.2. Frequency distribution of the number of core measures by annual rate of change (n=44)



Note: For trend analyses of the core measures in the 2005 reports, 3 or more years of data are available for most measures in the measure sets; for a few, only 2 years are available.

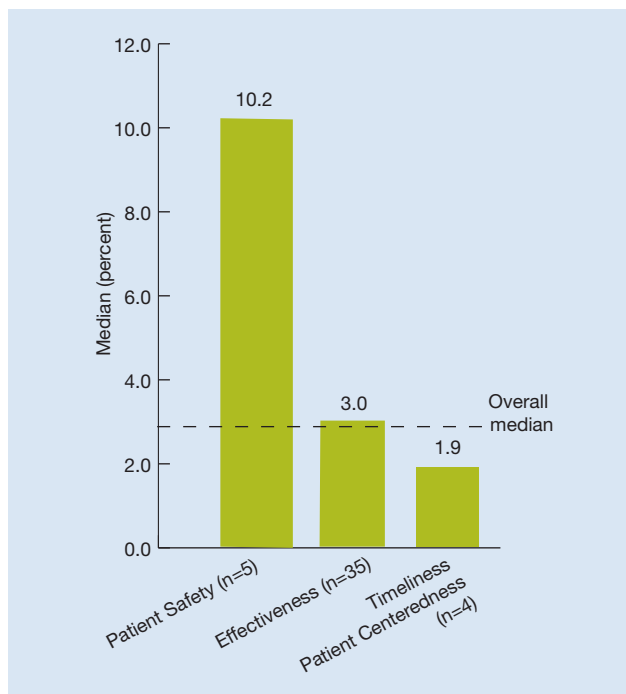
^{iv}Different methods were used to determine the median rate of improvement in this report versus the 2004 report. This year, the NHQR reports on core versus all measures with two data points, annual change versus report-to-report change, and the geometric average versus arithmetic average in determining annual change. For more details, see Chapter 1, Introduction and Methods.

Health Care Quality Improvement Is Variable, With Notable Areas of High Performance

Of the four dimensions of health care quality, measures of patient safety showed the greatest improvement:

- The five core measures of patient safety improved by an overall median of 10.2%, with a range of 2% to 39% (Figure H.3).
- The patient safety improvement rate is 3.4 times the rate for effectiveness measures (3.0%) and over 5 times the rate for patient centeredness and timeliness measures combined (1.9%).

Figure H.3. Median rate of improvement, by health care dimension



Highlights

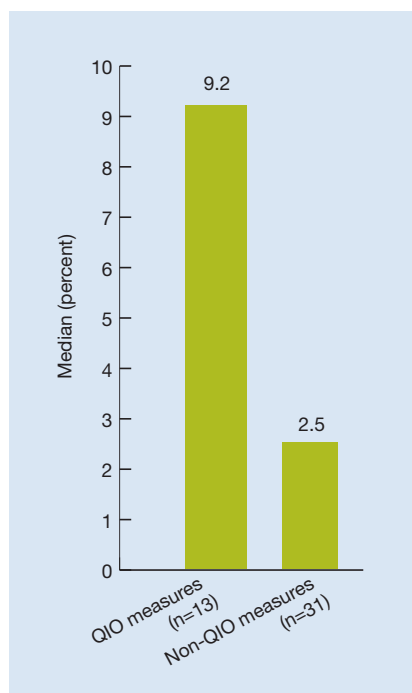
Within the effectiveness component, a subset of measures of care for certain measure areas contribute most to overall improvement:

- The diseases and populations which showed the most improvement in quality measures are diabetes, heart disease, respiratory conditions, nursing home care, and maternal and child health care. The overall rate of change for these measures was 5.4%.
- The diseases and populations which showed the least improvement in quality measures are HIV and AIDS, cancer, end stage renal disease, mental health and substance abuse, and home health care. The overall rate of change for these measures was 0.3%.

Medicare's Quality Improvement Organization (QIO)^v measures for the treatment of heart disease and pneumonia showed a much higher rate of improvement than non-QIO measures:

- Medicare's QIO measures for heart disease and pneumonia showed a combined rate of improvement (9.2%) that was almost four times the combined rate for all the other measures (2.5%) (Figure H.4).

Figure H.4. Improvement rate for QIO measures versus non-QIO measures



^vFor more information about Medicare's Quality Improvement Organizations, see www.cms.hhs.gov/qio/.

Health Care Quality Is Improving, but More Remains To Be Done To Achieve Optimal Quality

Many measures showing significant improvement are far from meeting Healthy People 2010^{vi} objectives, such as:

- **Breast cancer.** Between 1999 and 2002, the number of age-adjusted breast cancer deaths per 100,000 population decreased significantly from 26.6 to 25.6. At this pace, the Healthy People 2010 target of 22.3 will not be met. Even when this target is met, approximately 40,000 women will still die from breast cancer annually.
- **End stage renal disease.** The percentage of dialysis patients on the waiting list for transplantation improved from 14.7% in 1998 to 15.9% in 2002. The rate is well below the Healthy People 2010 target of 66%. At this pace, the target will not be met for 70 years.
- **High blood pressure.** Among those treated for high blood pressure, the proportion who have it under control increased significantly from 23% in 1988-1994 to 29% in 1999-2002. The Healthy People 2010 target is 50%. At this pace, the target will not be met for 20 years.
- **Pneumonia.** The percentage of adults age 65 and over who ever received pneumococcal vaccination increased significantly from 49.9% in 1999 to 55.7% in 2003. The Healthy People 2010 target is 90%. At this pace of change, it will take 15 years to meet the target.

Many measures are slow to change and present significant challenges to quality improvement. Examples include:

- **Breast cancer.** The overall rate of late stage breast cancer has not changed over the past 10 years.
- **AIDS.** The rate of new AIDS cases has not changed over the past 5 years and remains 17 times higher than the Healthy People 2010 target.
- **Smoking.** Over a third of patients hospitalized with a heart attack who smoke report that their doctor did not advise them to quit smoking. This rate has not changed over the last 3 years.
- **Overuse of antibiotics.** The rate of outpatient visits for the common cold in which antibiotics were prescribed has not changed over the past 5 years and is 35% higher than the Healthy People 2010 target.
- **Heart attack.** Among Medicare heart attack patients, the median time from arrival to the initiation of thrombolytic therapy has not changed over the past 3 years and is 50% longer than the national target.
- **Medication errors.** The percentage of elderly that had 1 of 11 drugs that should always be avoided by the elderly remained unchanged at about 3% over the past 6 years.

^{vi} Healthy People 2010 is the Department of Health and Human Services “statement of national health objectives designed to identify the most significant preventable threats to health and to establish national goals to reduce these threats.” For more information, see www.healthypeople.gov/.

Sustained Rates of Quality Improvement Are Possible

Improvement on Selected Measures

A subset of the core measure set with 4 or more years of data provides an opportunity to highlight examples of areas where significant and sustained improvement is evident. In future NHQRs, it will be possible to enlarge this subset of measures. The following measures showed an average rate of annual improvement of at least 2.5% over 4 or more years:

Measure	Average annual percent improvement
Adolescents age 13-15 years who received 3 or more doses of hepatitis vaccine	13.2
Children age 19-35 months who received all recommended vaccines	5.5
Hospital admissions for pediatric gastroenteritis	4.2
Acute myocardial infarction (AMI) mortality rate	3.0
Hospital admissions for pediatric asthma	2.5

It is noteworthy that four of these measures relate to health care quality for children. These are substantial accomplishments for children and adolescents. For example, if the current rate of improvement for adolescents who receive the hepatitis B vaccine were to continue, nearly every adolescent in the Nation will receive this recommended care within the next 4 years.

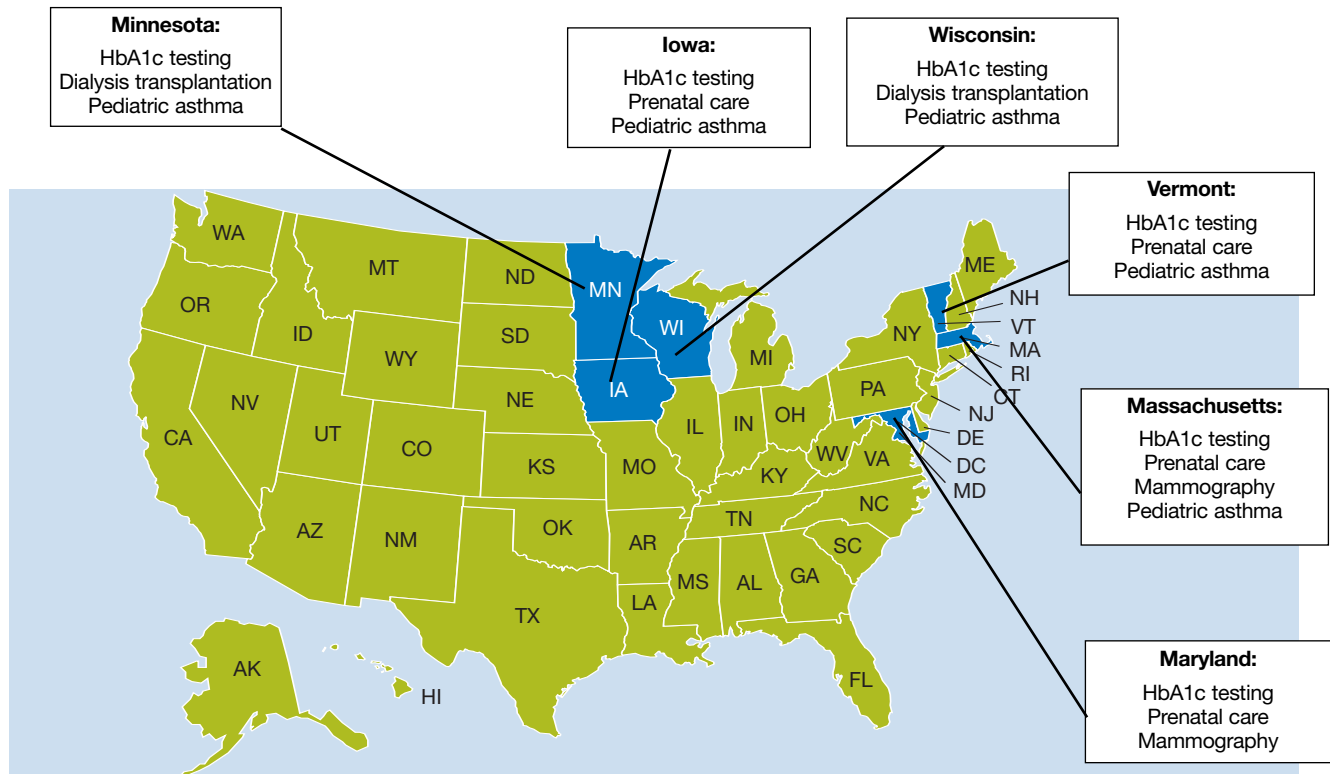
Sustained Improvement by States

Chapter 2, Effectiveness presents data on States which have demonstrated sustained, high quality health care on a variety of measures. Six States—Iowa, Maryland, Massachusetts, Minnesota, Vermont, and Wisconsin—showed performance that was significantly above the average for 2 or more years on at least three of the following core measures—mammography screening, hemoglobin A1c (HbA1c) testing,^{vii} dialysis patients on transplantation waiting list, early prenatal care, and pediatric asthma hospitalization rate (Figure H.5). As more data become available, future NHQRs will continue to track broad and sustained quality improvement by States with more measures and over longer periods of time.

^{vii}The HbA1c test measures average blood glucose.

Highlights

Figure H.5. States demonstrating sustained, high quality health care improvement on selected measures



Sources: HbA1c testing: Centers for Disease Control and Prevention, Behavioral Risk Factor Surveillance System, 2001-2003. Dialysis transplantation: University of Michigan Kidney Epidemiology and Cost Center, 1999-2002. Pediatric asthma: Agency for Healthcare Research and Quality, HCUP State Inpatient Databases, 2000-2002. Prenatal care: National Vital Statistics System - Natality, 1999-2002. Mammography: Centers for Disease Control and Prevention, Behavioral Risk Factor Surveillance System, 2000, 2002.

Looking Forward

The National Healthcare Quality Report continues to present the broadest examination of quality of health care undertaken in the United States. As noted above, quality is improving across most measures, but the pace of change is slow overall and variable across the measures. Improvements have been demonstrated, such as those in patient safety and in care for certain diseases and populations. For too many measures, however, the current rate of change will not lead to optimal care in this generation. For a few measures and a few States, the evidence of sustained improvement demonstrates that dramatic change is possible and replicable.

The NHQR concentrates on the national view of health care quality and is descriptive and not prescriptive about how to achieve quality improvement. Quality improvements result from focused projects at the regional and local level and are supported by more detailed data to facilitate decisionmaking. Quality improvements for the whole Nation will result from coordinated actions at Federal, State, and local levels to extend the benefits of regional and local successes nationwide. During 2005, AHRQ released several information resources to help States target their quality improvement efforts^{viii} and launched *QualityConnect*, an initiative focused on improving health care in partnership with States. In the future, these tools and similar initiatives will help the Nation to accelerate ever further its rate of progress toward optimal health care quality for all.

^{viii}These resources include *Diabetes Care Quality Improvement: A Resource Guide for State Action* and its companion *Workbook* (see www.ahrq.gov/qual/diabqualoc.htm) and several online tools for States developed from the 2004 NHQR (see www.qualitytools.ahrq.gov/qualityreport/state).

Chapter 1. Introduction and Methods

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

The first National Healthcare Quality Report, released in 2003, was a comprehensive national overview of the quality of health care received by the general U.S. population. The second NHQR developed a second critical goal of the report series—tracking the Nation’s quality improvement progress.

This third NHQR meets these goals more completely and rigorously. New databases and measures are added to provide a more comprehensive assessment of health care quality in the Nation. While the 2005 report aims to include more data, efforts have been made to make this growing body of information more understandable. Thus, the most important and scientifically supported measures—identified as *core report measures*—have been selected from the full NHQR measure set; this year’s report begins annual tracking of these measures. Guided by a panel of experts, development of many new composite measures has also begun, and four are included in this report.

How This Report Is Organized

The basic structure of the NHQR is unchanged from last year and consists of the following:

- **Highlights** summarizes key themes from the 2005 report.
- **Chapter 1: Introduction and Methods** documents the organization, data sources, and methods used in the 2005 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 (HP2010) condition areas. Measures of 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 hospital-acquired infections, injuries or adverse events due to medical care, and medication safety.
- **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 for both routine and emergency services in order to incorporate the patient’s experience and perspective into the report.

Two appendixes are available online (www.qualitytools.ahrq.gov):

- **Measure Specifications Appendix** provides information about each database analyzed for the NHQR including data type, sample design, and primary content; detailed methods for select databases analyzed for the NHQR; and information about how to generate each measure. Measures highlighted in the report are described, as well as other measures that were examined but not included in the text of the report.
- **Data Tables Appendix** provides detailed tables for most measures analyzed for the NHQR, including both 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.

New in This Report

Consistent with the goal of improving quality of and access to health care for all Americans, a number of improvements in the quality and accessibility of the NHQR are introduced each year. Improvements include the selection of core report measures, changes to the measure set, addition of new composite measures, addition of new data sources, expanded analyses, and summary of quality.

Selection of Core Report Measures

With broad support across the Department of Health and Human Services, the 2004 NHQR and NHDR were restructured as chartbooks. In the 2005 reports, the presentation of information is further refined and standardized. The HHS Interagency Work Groups were again convened to select a group of measures from the full measure sets on which the reports would present findings each year. Focus on tracking these core report measures allows more detailed discussion of this subset of measures, which represent the most important and scientifically sound measures in the full measure sets. In addition, readers will be able to more readily observe changes in the same measures each year.

Measures in the full measure set must have met criteria based on importance, scientific soundness, and feasibility. The Interagency Work Groups established additional criteria for selecting the core report measures. Many of these criteria were based on criteria used to select the Healthy People 2010 Leading Health Indicators as well as criteria used last year to select measures to highlight in the 2004 reports. Primary, secondary, and balancing criteria are listed in Table 1.1. Primary criteria were given greater weight than secondary criteria. Balancing criteria were included to ensure that core report measures covered all conditions and sites of care included in the full measure sets. This process yielded 46 core report measures¹ of health care quality.

¹For a complete listing of these measures, see the List of Core Report Measures at the end of this report.

Table 1.1. Criteria for selecting core report measures

Primary criteria	<ul style="list-style-type: none"> • Importance/clinical significance/prevalence • Data reliable • Able to be tracked for multiple groups and at multiple levels/number of comparisons possible • Sensitive to change/evidence-based process measures favored over outcomes • Easy to interpret and understand/methodological simplicity • High utility for directing public policy
Secondary criteria	<ul style="list-style-type: none"> • Applicable to general population rather than unique to select population • Data available regularly/data available recently • Linkable to established indicator sets (i.e., Healthy People 2010 targets) • Data source supports multivariate modeling
Balancing criteria	<ul style="list-style-type: none"> • Balance across health conditions • Balance across sites of care • At least some State data • At least some multivariate models

Each section in the 2005 report begins with a description of the importance or impact of the section’s topic. Where possible, this introduction is now provided in a tabular format, which presents general statistics in two columns. Then, chart figures and accompanying findings highlight the core report measures relevant to this topic. Almost all core report measures include multiple years of data, and figures typically illustrate trends over time. As in last year’s report, findings presented in the text must meet report criteria for importanceⁱⁱ; comparisons not discussed in text do not meet these criteria.

The core report measures are generally representative of the full measure set when testing trends over time. For example, one test of the representativeness of the core report measures is to compare the median of the annual percent change for the full measure set and the core measure set. A panel of experts reviewed the core report measures in this way and concluded that the medians were approximately the same for both the core report measures and the full measure set.

Changes to the Measure Set

The measure sets used in the 2005 NHQR and NHDR have been improved in several ways. A handful of measures were modified to reflect more current standards of care. Also, a number of new measures were added to fill identified gaps, including:

- Two measures of quality of HIV care from the HIV Research Network:ⁱⁱⁱ
 - HIV patients with CD4 cell count <200 who received *Pneumocystis pneumonia* prophylaxis (core report measure).
 - HIV patients with CD4 cell count <50 who received disseminated *Mycobacterium avium* complex prophylaxis.

ⁱⁱCriteria for importance of trends include statistical significance at the alpha=0.05 level, two-tailed test, and a relative difference of at least 1% per year.

ⁱⁱⁱThe HIV Research Network is an AHRQ-sponsored tool that provides statistics on medical resource utilization by persons with HIV infection.

- Three measures of quality of mental health care from the Substance Abuse and Mental Health Services Administration’s (SAMHSA’s) National Survey on Drug Use and Health:
 - Adults with serious mental illness who received treatment or counseling.
 - Adults with serious mental illness receiving treatment who get better (core report measure).
 - People who needed treatment for substance abuse who received such treatment (core report measure).
- One measure of quality of substance abuse treatment from SAMHSA’s Treatment Episode Data Set:
 - Patients receiving substance abuse treatment who complete treatment (core report measure).

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

Addition of New Composite Measures

Composite measures can be used to facilitate understanding of information from many individual measures. Composite measures used in previous reports include the percentage of diabetics who receive a number of recommended services^{iv} and the percentage of children who receive all recommended vaccines. Because these composite measures were reported to be useful by a variety of policymakers, an effort was made to identify new composite measures for the 2005 and future reports.

A panel of experts consisting of health statisticians and health policymakers from the Federal and private sectors was convened to provide guidance. This panel made recommendations about the selection of appropriate models for different types of composite measures as well as for specific composite measures that could be crafted from the current report measure sets.

A number of these recommended composite measures were developed for the 2005 reports. These new composite measures utilize an “opportunities model.” The 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. For an opportunities model composite:

- The denominator is the total number of opportunities to receive appropriate care across a panel of process measures.
- The numerator is the sum of the opportunities for appropriate care that are actually delivered.

The composite measure is typically presented as the proportion of appropriate care that is delivered.

In addition, a composite measure of patient-provider communication developed for the CAHPS[®] (formerly known as Consumer Assessment of Health Plans¹) survey is included in this report. The composite measure averages four measures of patient centeredness used in previous NHQRs and NHDRs. The composite measure is typically presented as the proportion of respondents who reported that their doctors sometimes or never, usually, or always communicated well.

^{iv}This composite measure was modified between the 2004 and 2005 reports. The current composite measure on diabetes care focuses on receipt of the three processes for which the best data are available: HbA1c testing, retinal eye examination, and foot examination in the past year.

New composite measures included in the 2005 reports and the individual measures they aggregate are shown in Table 1.2. In response to feedback from policy stakeholders, future reports will include even more composite measures.

Table 1.2. New composite measures in the 2005 NHQR and NHDR

Composite measure	Individual measures forming composite
Recommended hospital care for heart attack	<ul style="list-style-type: none"> • Receipt of aspirin within 24 hours of hospitalization • Receipt of aspirin upon discharge • Receipt of beta-blocker within 24 hours of hospitalization • Receipt of beta-blocker upon discharge • Receipt of ACE inhibitor for left ventricular systolic dysfunction • Receipt of counseling about smoking cessation among smokers
Recommended hospital care for heart failure	<ul style="list-style-type: none"> • Receipt of evaluation of left ventricular ejection fraction • Receipt of ACE inhibitor for left ventricular systolic dysfunction
Recommended hospital care for pneumonia	<ul style="list-style-type: none"> • Receipt of initial antibiotics within 4 hours • Receipt of appropriate antibiotics • Receipt of culture before antibiotics • Receipt of influenza screening or vaccination • Receipt of pneumococcal screening or vaccination
Patient-provider communication problems	<ul style="list-style-type: none"> • Provider sometimes or never listened carefully to them • Provider sometimes or never explained things clearly • Provider sometimes or never showed respect for what they had to say • Provider sometimes or never spent enough time with them

Addition of New Data Sources

As in previous years, new sources of data were identified and added to help fill data gaps (Table 1.3). New data added this year come from:

- The Substance Abuse and Mental Health Services Administration’s Treatment Episode Data Set (TEDS), which provides information on about 1.5 million substance abuse treatment admissions annually.
- The Centers for Disease Control and Prevention’s (CDC’s) National Program of Cancer Registries (NPCR) (covering 45 States and the District of Columbia), which, together with data from the Surveillance, Epidemiology, and End Results (SEER) Program (9 States and 6 metropolitan areas), provides population-based cancer incidence data for the entire Nation.
- The Centers for Medicare & Medicaid Services (CMS) and the Hospital Quality Alliance’s Hospital Compare, which provides audited, near real-time information from 4,200 hospitals on care for heart attack, heart failure, and pneumonia.

Standardized suppression criteria were applied to all databases to support reliable estimates.^v

^vEstimates based on sample size fewer than 30 or with relative standard error greater than 30% were considered unreliable and suppressed. Databases with more conservative suppression criteria were allowed to retain them.

Expanded Analyses

In previous NHQRs and NHDRs, many measures were only tracked for 2 years, limiting the ability to detect trends. In the 2005 reports, 3 or more years of data are now presented for most measures in the measure sets. In addition, methods for assessing temporal change have been improved and standardized.

In the 2005 reports, estimates for the earliest year and most recent year for each measure are used to calculate average annual rate of change. Consistent with *Health, United States*,² the geometric rate of change, which assumes the same rate of change each year between the two time periods, has been calculated.

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 2005 reports.

Summary of Quality

In the 2005 NHQR, there have been a number of changes in measures, data, analysis, presentation, and emphasis. The focus on the Nation's progress in health care quality improvement is evident throughout the report. In the Highlights, the annual rate of quality improvement across all the core report measures is summarized; and, in Chapters 2-5 which follow, the rates of change for the core report measures are also examined in detail. As noted in Table 1.2, new composite measures are included for heart attack, heart failure, pneumonia, and patient-provider communication. These measures provide a summary description of the present state of quality as well as progress over time; these are complemented by information on each of the measures which comprise the composite. Statistical rules are used to characterize improvement in all the measures.

All of these changes have been made in response to requests from many constituencies who use the NHQR, including policymakers, clinicians, health system administrators, State and community leaders, and other users.

Introduction and Methods

Table 1.3. Databases used in the 2005 reports (new databases in italics)

Surveys collected from samples of civilian populations:

- AHRQ, Medical Expenditure Panel Survey (MEPS), 1999-2002
- CDC-National Center for Health Statistics (NCHS), National Health Interview Survey (NHIS), 1998-2003
- CDC-NCHS/National Immunization Program, National Immunization Survey (NIS), 1998-2003
- CMS, Medicare Current Beneficiary Survey (MCBS), 1998-2002
- Health Resources and Services Administration (HRSA), Community Health Center User Survey, 2002
- SAMHSA, National Survey on Drug Use and Health (NSDUH), 2002-2003

Data collected from samples of health care facilities and providers:

- CDC-NCHS, National Ambulatory Medical Care Survey (NAMCS), 1997-2002
- CDC-NCHS, National Hospital Ambulatory Medical Care Survey-Outpatient Department (NHAMCS-OPD), 1997-2002
- CDC-NCHS, National Hospital Ambulatory Medical Care Survey-Emergency Department (NHAMCS-ED), 1997-2002
- CDC-NCHS, National Hospital Discharge Survey (NHDS), 1998-2003
- CMS, End Stage Renal Disease Clinical Performance Measures Project (ESRD CPMP), 2001-2003

Data extracted from data systems of health care organizations:

- AHRQ, Healthcare Cost and Utilization Project, (HCUP), 1994-2002
- *CMS, Hospital Compare, 2004*
- CMS, Medicare Patient Safety Monitoring System, 2002-2003
- CMS, Nursing Home Minimum Data Set, 2002-2003
- CMS, Quality Improvement Organization (QIO) program, 2000-2003
- HIV Research Network data (HIVRN), 2001-2002
- Indian Health Service (IHS), National Patient Information Reporting System (NPIRS), 2002-2003
- National Committee for Quality Assurance (NCQA), Health Plan Employer Data and Information Set (HEDIS), 2001-2004
- National Institutes of Health (NIH), United States Renal Data System (USRDS), 1998-2002
- *SAMHSA, Treatment Episode Data Set (TEDS), 2002*

Data from surveillance and vital statistics systems:

- CDC, National Nosocomial Infections Surveillance, 1998-2003
- *CDC, National Program of Cancer Registries (NPCR), 2002*
- CDC-National Center for HIV, STD, and TB Prevention, HIV/AIDS Surveillance System, 2000-2003
- CDC-National Center for HIV, STD, and TB Prevention, TB Surveillance System, 1999-2001
- CDC-NCHS, National Vital Statistics System (NVSS), 1999-2002
- NIH-National Cancer Institute (NCI), Surveillance, Epidemiology, and End Results (SEER) program, 1992-2002

References

1. Hargraves J, Hays RD, Cleary PD. Psychometric properties of the Consumer Assessment of Health Plans Study (CAHPS) 2.0 adults core survey. *Health Serv Res* 2003 Dec;38(6 Pt 1):1509-27.
2. National Center for Health Statistics. *Health, United States, 2004. With Chartbook on Trends in the Health of Americans*. Hyattsville, MD: CDC, National Center for Health Statistics, 2004. Available at: <http://www.cdc.gov/nchs/data/hus/hus04.pdf>. Accessed October 11, 2005.

Chapter 2. Effectiveness

As noted in Chapter 1, 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 and home health 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.

To facilitate identifying the measures discussed below as related to the patient's need for preventive care, treatment of acute illness, or chronic disease management, the core measures highlighted on the following pages are categorized as follows:

Section	Measure
Prevention:	
Cancer	Mammography
Cancer	Newly diagnosed advanced stage breast cancer
Cancer	Breast cancer mortality
Heart disease	Counseling smokers to quit smoking
HIV and AIDS	New AIDS cases
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	Receipt of hepatitis B vaccine by adolescents
Maternal and child health	Untreated dental caries in children*
Maternal and child health	Dental visits by children
Maternal and child health	Receipt of counseling about physical activity by children
Respiratory diseases	Pneumococcal vaccination
Treatment:	
Heart disease	Receipt of recommended care for acute heart failure
Heart disease	Receipt of recommended care for heart attack
Heart disease	Inpatient mortality following heart attack
Maternal and child health	Hospital admissions for pediatric gastroenteritis
Mental health and substance abuse	Degree of helpfulness of mental health care
Mental health and substance abuse	Receipt of needed substance abuse treatment
Mental health and substance abuse	Completion of substance abuse treatment
Respiratory diseases	Receipt of recommended care for pneumonia
Respiratory diseases	Receipt of antibiotics for the common cold

Management:

Diabetes	Receipt of three recommended diabetic services
Diabetes	Controlled hemoglobin, cholesterol, and blood pressure
Diabetes	State variation in hemoglobin A1c testing*
End stage renal disease (ESRD)	Adequacy of hemodialysis
End stage renal disease (ESRD)	Registration for transplantation
Heart disease	Blood pressure monitoring and control*
Respiratory diseases	Hospital admissions for pediatric asthma
Nursing home and home health care	Use of restraints among chronic care nursing home residents
Nursing home and home health care	Presence of pressure ulcers among nursing home residents
Nursing home and home health care	Improvement in ambulation in home health episodes
Nursing home and home health care	Acute care hospitalization of home health patients

* Supplemental measure

Effectiveness**Cancer****Cancer****Importance and Measures****Mortality**

Number of deaths (2005 est.)	570,280 ¹
Cause of death rank (2003).....	2nd ²

Prevalence

Number of Americans that have been diagnosed with cancer (2001).....	9,800,000 ¹
----------------------------------------------------------------------	------------------------

Incidence

New cases (2005 est.)	1,372,910 ¹
New cases of breast cancer in women (2005 est.).....	211,240 ¹

Cost

Total cost ⁱ (2005)	\$209.9 billion ³
Direct costs ⁱⁱ (2005).....	\$74 billion ³

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. The 2004 NHQR highlighted colorectal cancer; this year's focus is on breast cancer—specifically, prevention. The core report measures are:

- Mammography
- Advanced stage breast cancer
- Breast cancer mortality

ⁱTotal cost is composed of the cost of medical care itself (direct cost), in addition to the indirect, economic costs of morbidity and mortality.

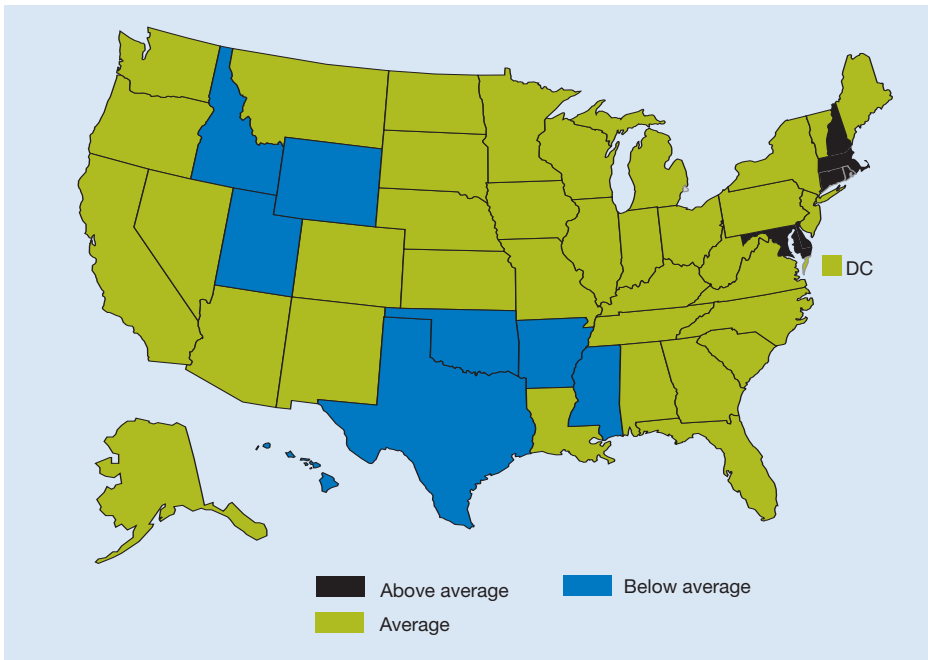
ⁱⁱDirect costs are defined as “personal health care expenditures for hospital and nursing home care, drugs, home care, and physician and other professional services.” National Heart, Lung, and Blood Institute. Fact Book Fiscal Year 2004. Bethesda, MD: U.S. Department of Health and Human Services, National Institutes of Health, National Heart, Lung, and Blood Institute.

Findings

Prevention: Mammography

Early detection of cancer increases treatment options and the chances for survival.¹ Mammography, the most effective method for detecting breast cancer at its early stages,⁴ 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 older.⁵

Figure 2.1. Women age 40 and over who report they had a mammogram within the past 2 years, 2000, 2002



Source: Centers for Disease Control and Prevention, Behavioral Risk Factor Surveillance System, 2000, 2002.

Key: Above average = mammography rate is significantly above the all-States average in both 2000 and 2002. Below average = mammography rate is significantly below the all-States average in both 2000 and 2002.

Note: "All-States average" is the average of all responding States (51 including DC), which is a separate figure from the national average.

- Six Statesⁱⁱⁱ were significantly above the average for all States in both 2000 and 2002, with a combined average mammography rate of 80.2% in 2002 (Figure 2.1).
- For 2003, the national mammography rate (received within the past 2 years) was 69.5% (National Health Interview Survey). This is very close to the Healthy People 2010 target of 70% but not significantly different from the national rate in 2000.

ⁱⁱⁱThe six States are New Hampshire, Massachusetts, Connecticut, Rhode Island, Maryland, and Delaware.

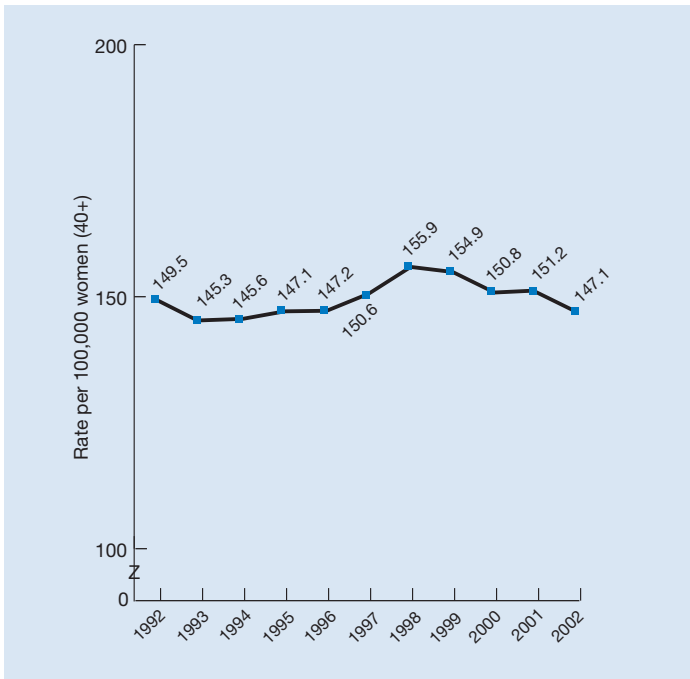
Effectiveness

Cancer

Prevention: Advanced Stage Breast Cancer

Cancers can be diagnosed at different stages of development. Monitoring the rate of cases of cancer that are diagnosed at late or advanced stages is a measure of the effectiveness of cancer screening efforts.

Figure 2.2. Age-adjusted rate of late stage (stage II or higher) breast cancer per 100,000 women age 40 and older, 1992-2002



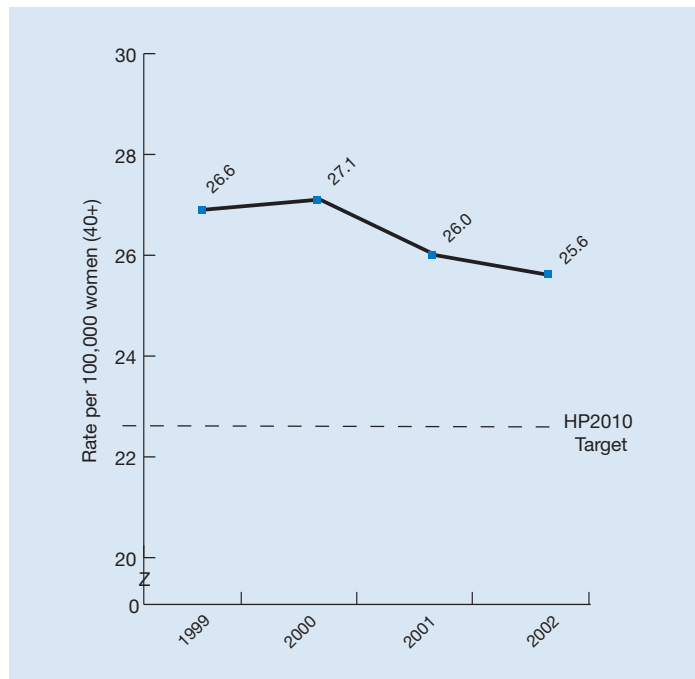
Source: Surveillance, Epidemiology, and End Results Program, 1992-2002.

- Between 1992 and 2002, the overall rate of late stage breast cancer did not change significantly (Figure 2.2).

Effectiveness**Cancer****Prevention: Breast Cancer Mortality**

The ultimate outcome of the quality of care provided to patients is the death rate. From 1995 to 2001, the 5-year survival rate for breast cancer was 88.2%.⁶ Breast cancer mortality is also measured as the number of deaths per 100,000 females.

Figure 2.3. Cancer deaths per 100,000 female population per year for breast cancer, 1999-2002



Source: National Center for Health Statistics, National Vital Statistics System - Mortality.

Note: Breast cancer death rates are age adjusted.

- Between 1999 and 2002, the number of breast cancer deaths per 100,000 females decreased significantly from 26.6 to 25.6 (Figure 2.3).
- The breast cancer death rate in 2002 is higher than the Healthy People 2010 target of 22.3. At the present rate of change, this target will not be met by 2010.

Diabetes

Importance and Measures

Mortality

Number of deaths (2003)	73,965 ²
Cause of death rank (2003).....	6th ²

Prevalence

Total number of Americans with diabetes (2002)	18,200,000 ⁷
------------------------------------------------------	-------------------------

Incidence

New cases (age 20 and over, 2002).....	1,300,000 ⁷
----------------------------------------	------------------------

Cost

Total cost (2002).....	\$132 billion ⁷
Direct medical costs (2002)	\$92 billion ⁷

Measures

Effective management of diabetes includes appropriate receipt of hemoglobin A1c tests, eye exams, and foot exams, as well as measures of associated outcomes (such as control of cholesterol, blood pressure, and HbA1c^{iv} levels). The two core report measures highlighted in this section are:

- Receipt of three recommended diabetic services
- Controlled hemoglobin, cholesterol, and blood pressure

In addition, a supplemental measure is also presented:

- State variation in hemoglobin A1c testing

^{iv}HbA1c is glycosylated hemoglobin—the higher the level of glucose in the blood, the higher the HbA1c level.

Effectiveness

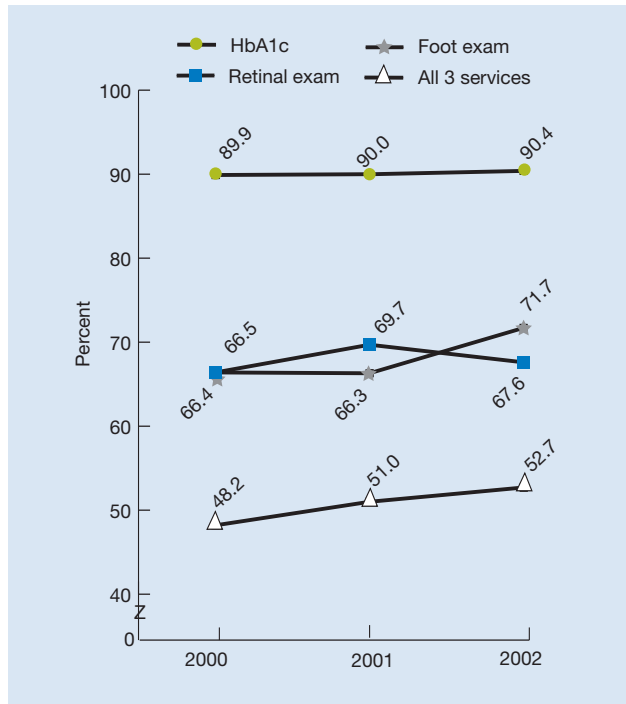
Diabetes

Findings

Management: Receipt of Three Recommended Diabetic Services

The NHQR tracks the national rates of the receipt of three recommended diabetes interventions, as well as a composite of the patients who received all three services.^v

Figure 2.4. Adults age 18 and over with diagnosed diabetes who received HbA1c test, retinal exam, foot exam, and all three tests, 2000-2002



Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2000-2002.

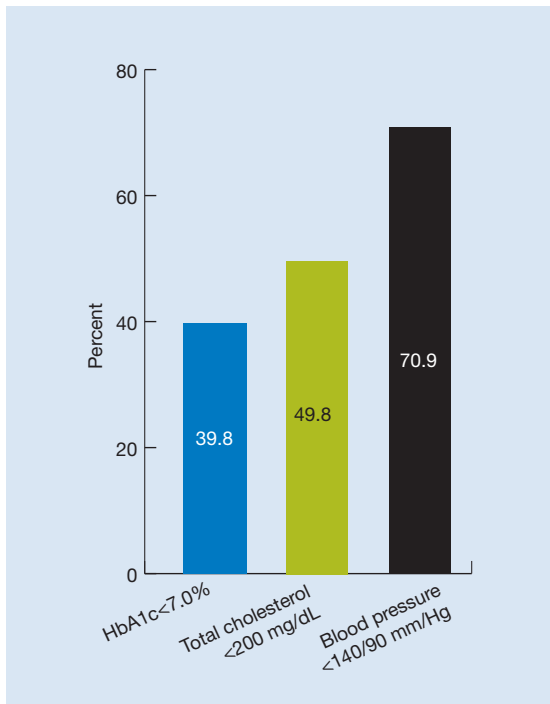
- In all 3 years, about half of adults with diagnosed diabetes age 18 and over reported receiving all three recommended tests for comprehensive diabetes care (Figure 2.4).
- The rate of receipt of HbA1c testing and annual retinal examination did not change significantly between 2000 and 2002.
- From 2000 to 2002, the percentage of adults with diagnosed diabetes who reported having an annual foot examination increased from 66% to 72%. At this rate of change, the Nation will achieve the Healthy People 2010 target of 75% by the year 2010.

^vIn the 2004 NHQR, the composite measure for diabetes management included five recommended tests and reported a 32% rate for the receipt of all five tests. In the 2005 composite, two of these tests, flu vaccination and lipid profile, were omitted due to differences in the manner in which they were collected. For further details, see Chapter 1, Introduction and Methods.

Effectiveness**Diabetes****Management: Controlled Hemoglobin, Cholesterol, and Blood Pressure**

Persons with diabetes are often at higher risk for other cardiovascular risk factors such as high blood pressure and high cholesterol. Having these conditions in combination with diabetes increases the likelihood of complications, such as heart and kidney diseases, blindness, nerve damage, and stroke. Patients who manage their diabetes and maintain HbA1c level of <7%, total cholesterol of <200 mg/dL, and blood pressure of <140/90 mm/Hg can decrease these risks.

Figure 2.5. Adults with diagnosed diabetes with HbA1c, total cholesterol, and blood pressure under control, 1999-2002



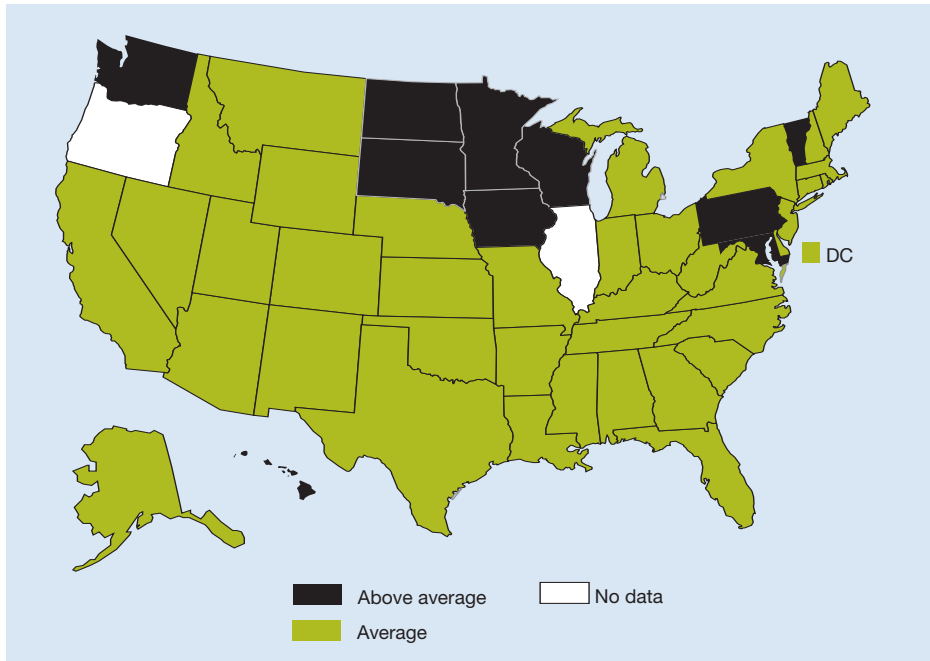
Source: National Center for Health Statistics, National Health and Nutrition Examination Survey, 1999-2002.

- Only 39.8% of those diagnosed with diabetes have their HbA1c level under optimal control (i.e., <7.0%) (Figure 2.5).
- Only half of those diagnosed with diabetes have their total cholesterol under control (<200 mg/dL).
- Only 70.9% of those diagnosed with diabetes have their blood pressure under control (<140/90 mm/Hg).

Management: State Variation in Hemoglobin A1c Testing

HbA1c test results reflect the percentage of glycosylated hemoglobin in the bloodstream, which reflects a patient's glucose control. Persons without diabetes typically have an HbA1c level of 5% or lower. As noted above, studies have shown that persons with diabetes that are able to keep their HbA1c level at 7% or less can reduce their risk for complications of the disease.

Figure 2.6. State variation in rates of adult receipt of annual HbA1c test, 2001-2003



Source: Centers for Disease Control and Prevention, Behavioral Risk Factor Surveillance System, 2001-2003.

Key: Above average = HbA1c testing is significantly above the all-States average in 2 of last 3 years (2001-2003).

Note: "All-States average" is the average of all responding States, which is a separate figure from the national average.

- Ten States^{vi} were significantly above the all-States average in 2 of the last 3 years (2001-2003), with a combined average rate of 92.1% in 2003 (Figure 2.6).
- Although the HbA1c testing rates for most reporting States did not change significantly between 2001 and 2003, New Jersey, Tennessee, and Wyoming each showed significant improvement over this time period.

^{vi} The 10 States are Hawaii, Washington, North Dakota, South Dakota, Minnesota, Iowa, Wisconsin, Pennsylvania, Maryland, and Vermont.

End Stage Renal Disease (ESRD)

Importance and Measures

Mortality

Total ESRD deaths (2003)	82,588 ⁸
Cause of death rank (2003)	>15th ²

Prevalence

Total cases (2003).....	452,957 ⁸
-------------------------	----------------------

Incidence

New cases (2003)	102,567 ⁸
------------------------	----------------------

Cost

Total ESRD program expenditures (2003).....	\$27.3 billion ⁸
---------------------------------------------	-----------------------------

Measures

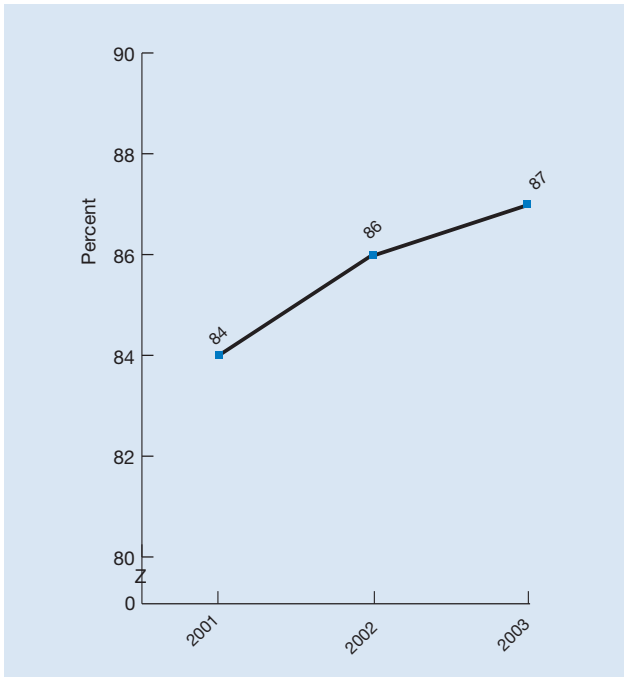
The NHQR includes six measures of ESRD management to assess the quality of care provided to renal dialysis patients. The two core report measures highlighted here are:

- Adequacy of hemodialysis
- Registration for transplantation

Effectiveness**End Stage Renal Disease****Findings****Management: Patients With Adequate Hemodialysis**

Dialysis removes harmful waste buildup 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 (URR) equal to or greater than 65%; this measure indicates how well urea, a waste product in the blood, is eliminated by the artificial kidney.

Figure 2.7. Hemodialysis patients with adequate dialysis (urea reduction ratio 65% or higher), 2001-2003



Source: Centers for Medicare & Medicaid Services ESRD Clinical Performance Measures Project, 2001-2003.

- Between 2001 and 2003, the percentage of all hemodialysis patients with adequate dialysis improved significantly, from 84% to 87% (Figure 2.7).

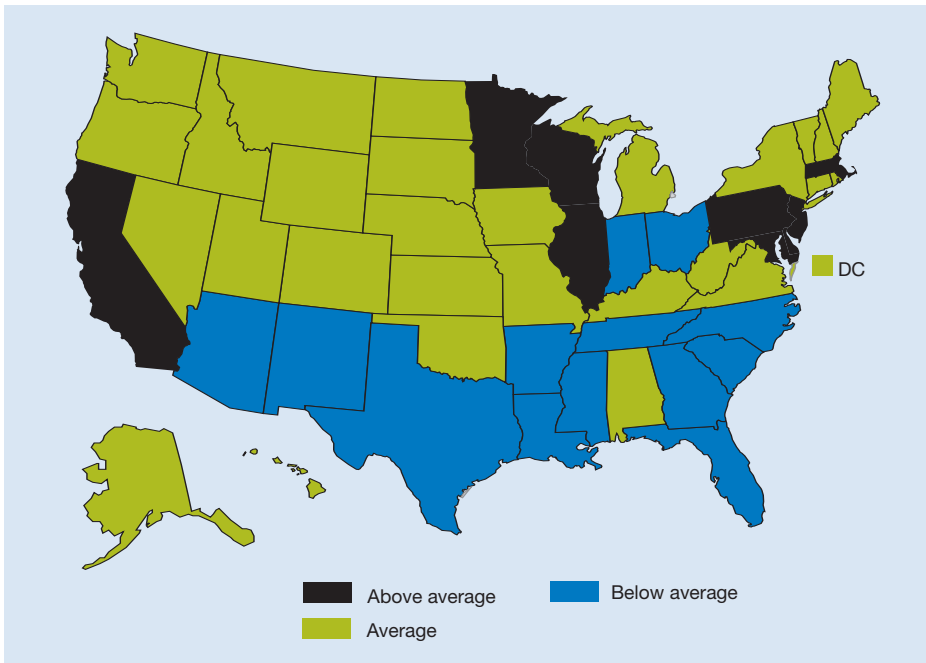
Effectiveness

End Stage Renal Disease

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.

Figure 2.8. State variation in dialysis patients registered on waiting list for transplantation by State, 1999-2002



Source: University of Michigan Kidney Epidemiology and Cost Center, 1999-2002.

Key: Above average = Rate is significantly above the all-States average in all 4 years of data (1999-2002). Below average = Rate is significantly below the all-States average in all 4 years of data (1999-2002).

Note: "All-States average" is the average of all responding States (51 including DC), which is a separate figure from the national average.

- Eight States^{vii} had rates above the all-States average in all 4 years from 1999 to 2002, with a combined average rate of 23.5% in 2002 (Figure 2.8).
- The national percentage of dialysis patients on the waiting list for transplantation improved from 14.7% in 1998 to 15.9% in 2002. However, the rate is well below the Healthy People 2010 target of 66%.

^{vii}The eight States are California, Minnesota, Wisconsin, Illinois, Pennsylvania, Maryland, New Jersey, and Massachusetts.

Heart Disease

Importance and Measures

Mortality

Number of deaths (2003)	684,462 ²
Cause of death rank (2003)	1st ²

Prevalence

Number of cases of coronary heart disease each year	13,000,000 ⁹
Number of cases of congestive heart failure each year	4,900,000 ⁹
Number of cases of high blood pressure each year	65,000,000 ⁹
Number of heart attacks each year	7,100,000 ⁹

Incidence

Number of new cases of congestive heart failure each year	550,000 ⁹
-----------------------------------------------------------------	----------------------

Cost

Total cost of cardiovascular disease (2005 est.)	\$393.4 billion ³
Total cost of congestive heart failure (2005 est.)	\$27.9 billion ⁹
Direct medical costs of cardiovascular disease (2005 est.)	\$241.8 billion ³

Measures

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

- Counseling smokers to quit smoking
- Receipt of recommended care for acute heart failure
- Receipt of recommended care for heart attack (acute myocardial infarction, or AMI)
- Inpatient mortality following heart attack

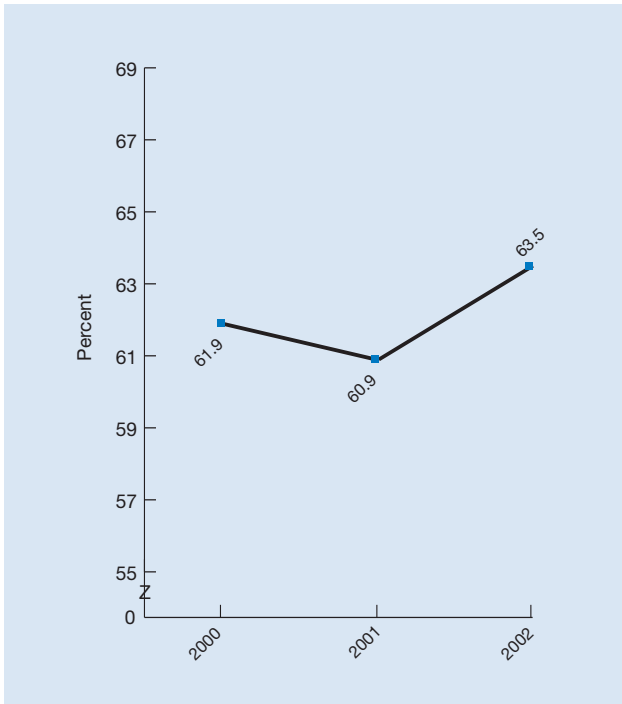
In addition, a supplemental measure focusing on appropriate disease management is also presented:

- Blood pressure monitoring and control

Effectiveness**Heart Disease****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 2.9. Current smokers age 18 and over with a checkup who reported receiving advice to quit smoking, 2000-2002



Source: Agency for Healthcare Research and Quality, Center for Financing, Access and Cost Trends, Medical Expenditure Panel Survey, 2000-2002.

- In 2002, 63.5% of smokers with routine office visits during the preceding year reported that their providers had advised them to quit (Figure 2.9).
- From 2000 to 2002, the rate of counseling to quit smoking did not change.

Effectiveness

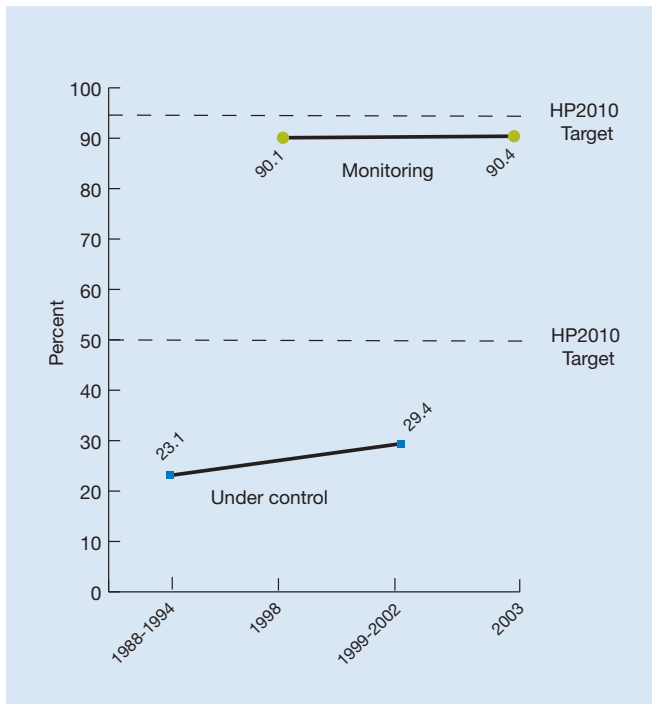
Heart Disease

Management: Blood Pressure Monitoring and Control

National screening guidelines for hypertension are well established.^{10 11} However, as elevated blood pressure is asymptomatic in most cases, it is not surprising that one-third of those affected do not know they have this condition.¹²

Although progress has been made in raising awareness of the importance of blood pressure screening and monitoring, blood pressure control among persons with diagnosed high blood pressure remains a problem.

Figure 2.10. Adults age 18 and over with blood pressure under control (<140/90 mm/Hg), 1988-1994 and 1999-2002, and with blood pressure monitoring, 1998 and 2003



Sources: Monitoring: Centers for Disease Control and Prevention, National Health Interview Survey, 1998 and 2003. Control: Centers for Disease Control and Prevention, National Center for Health Statistics, National Health and Nutrition Examination Survey, 1988-1994 and 1999-2002.

Note: Blood pressure monitoring involves having blood pressure measured in the past 2 years and being able to state whether blood pressure was normal or high.

- In 2003, the rate of blood pressure monitoring was 90.4%, which was not significantly different from the 1998 rate (Figure 2.10). The Healthy People 2010 target is 95%.
- Among patients who are under treatment for high blood pressure, the proportion who have their blood pressure under control increased significantly from 23.1% in 1988-1994 to 29.4% in 1999-2002. The Healthy People 2010 target is 50%.

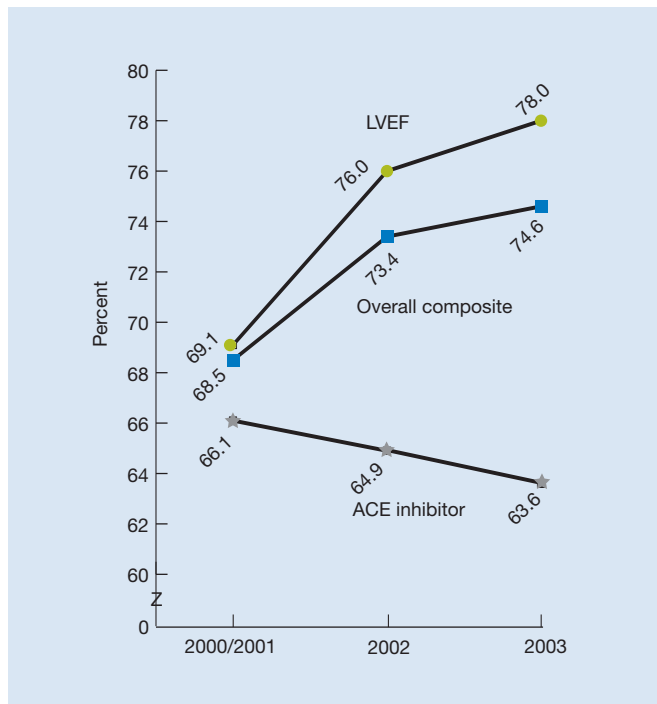
Effectiveness

Heart Disease

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, or LVEF), for recommended medication treatment (patients with left ventricular dysfunction prescribed an ACE inhibitor at discharge) and an overall composite measure based on the opportunities model which addresses the rate at which heart failure patients receive recommended care.

Figure 2.11. Receipt of recommended care for acute heart failure among Medicare patients: overall composite and two components, 2000-2001, 2002, and 2003



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

- The overall heart failure composite shows significant 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 74.6% in 2003 (Figure 2.11).
- The LVEF measure showed significant improvement and the ACE inhibitor measure showed no change.

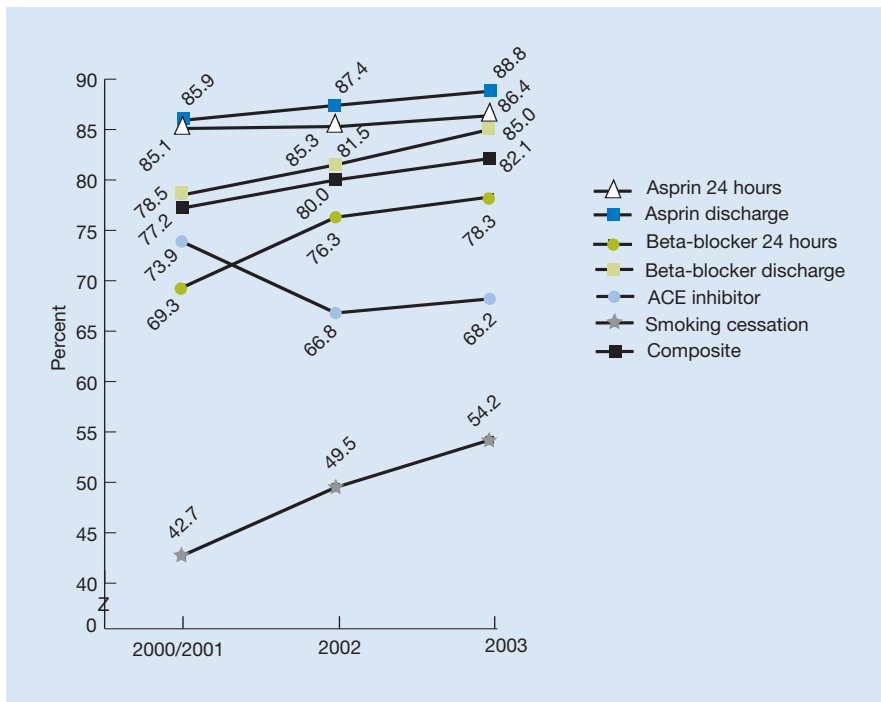
Effectiveness

Heart Disease

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, beta-blocker within 24 hours of attack and at discharge, ACE inhibitor 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 which addresses the rate at which heart attack patients receive recommended care.

Figure 2.12. Receipt of recommended care for heart attack among Medicare patients: overall composite and six components, 2000-2001, 2002, and 2003



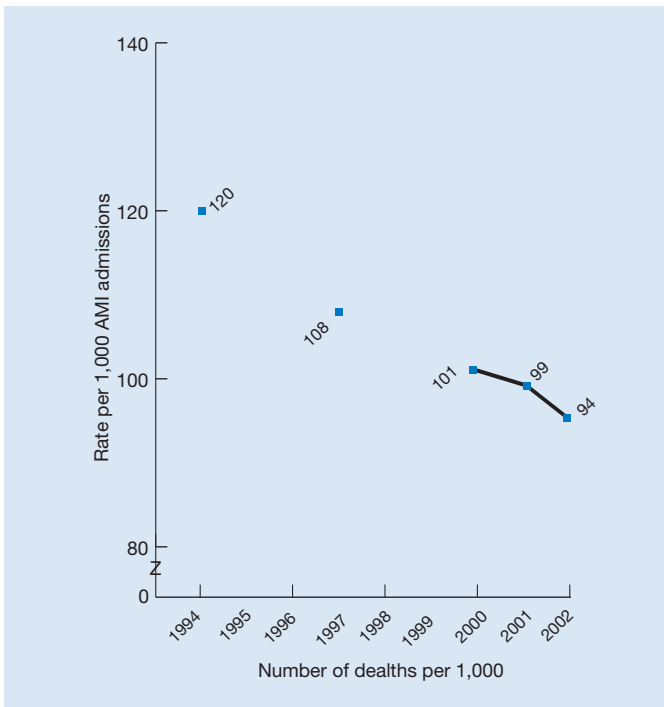
Source: Centers for Medicare & Medicaid Services, Medicare Quality Improvement Organization Program, 2000-2001, 2002, and 2003.

- The overall heart attack composite shows significant 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 82.1% in 2003 (Figure 2.12).
- Four of the component measures showed significant improvement, including aspirin at discharge, beta-blocker within 24 hours of admission and at discharge, and counseling for smoking cessation.
- From 2000/2001 to 2003, ACE inhibitor use fell significantly from 73.9% to 68.2%.

Effectiveness**Heart Disease****Treatment: Inpatient Mortality Following Heart Attack**

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

Figure 2.13. Deaths per 1,000 admissions with a heart attack as principal diagnosis, age 18 and older, 1994, 1997, and 2000-2002



Source: HCUP Nationwide Inpatient Sample, 1994, 1997, and 2000-2002.

Note: Rates are adjusted by age, gender, age-gender interactions, and APR-DRG scoring of risk of mortality.

- The inpatient mortality rate for heart attacks has declined gradually and steadily over the 9-year period from 120 to 94 deaths per 1,000 admissions with heart attack (Figure 2.13).

HIV and AIDS

Importance and Measures

Mortality

Number of AIDS deaths (2003).....	18,017 ¹³
Cause of death rank (2003)	>15th ²

Prevalence

Number of Americans living with HIV (2003 est.)	1,039,000-1,185,000 ¹⁴
Number of persons living with AIDS (2003 est.)	405,926 ¹⁵

Incidence

New cases of HIV annually (2003 est.)	approximately 40,000 ¹⁴
New AIDS cases (2003 est.).....	43,171 ¹⁵

Cost

Combined Federal and State Medicaid expenditures for AIDS (2003).....	\$8.5 billion ¹⁶
-----------------------------------------------------------------------	-----------------------------

Measures

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

- New AIDS cases

In addition, a supplemental measure related to prevention of opportunistic infections among HIV patients with low CD4+ counts is also presented:

- Eligible AIDS patients receiving PCP and MAC prophylaxis

Effectiveness

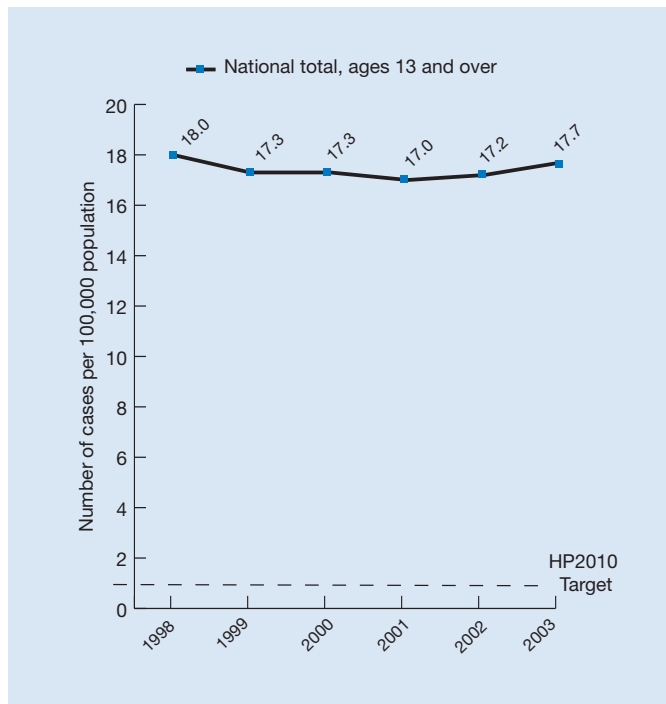
HIV and AIDS

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.

Figure 2.14. New AIDS cases per 100,000 population, 1998-2003



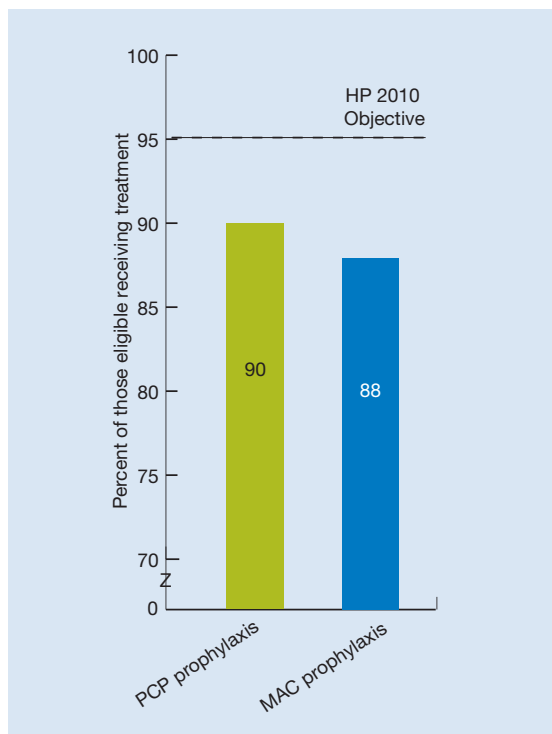
Source: Centers for Disease Control and Prevention, National Center for HIV, STD and TB Prevention, HIV/AIDS Reporting System, 1998-2003.

- The rate of new AIDS cases per 100,000 has not changed significantly between 1998 and 2003 (Figure 2.14).
- The 2003 national rate of 17.7 new AIDS cases per 100,000 persons is well above the Healthy People 2010 target of 1.0 new case per 100,000 persons.

Prevention: PCP and MAC Prophylaxis

Management of chronic HIV disease includes outpatient and inpatient services. Because national data on HIV care are not routinely collected, HIV measures tracked in NHQR come from the HIV Research Network, which consists of 18 medical practices across the United States that treat large numbers of HIV patients. Although program data are collected from all Ryan White CARE Act grantees, the aggregate nature of the data makes it difficult to assess the quality of care provided by Ryan White CARE Act providers. 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 *Pneumocystis pneumonia* (PCP) is routinely recommended; when CD4 cell counts fall below 50, medicine to prevent development of disseminated *Mycobacterium avium* complex (MAC) infection is routinely recommended.¹⁷

Figure 2.15. Percentage of eligible AIDS patients receiving PCP and MAC prophylaxis, 2002



Source: HIV Research Network, 2002.

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 only represent patients that 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 those patients eligible (2,533 AIDS patients with at least two CD4 cell counts below 200), 90% received PCP prophylaxis (Figure 2.15), which is below the Healthy People 2010 target of 95%.
- Of those patients eligible (754 AIDS patients with at least two CD4 cell counts below 50), 88% received MAC prophylaxis, which is below the Healthy People 2010 target of 95%.

Maternal and Child Health

Importance and Measures

Mortality

Number of maternal deaths (2003)	357 ¹⁸
Number of infant deaths (2003)	28,428 ²

Demographics

Number of children under 18 (2004).....	73,277,998 ¹⁹
Number of babies born in United States (2003)	4,091,063 ²⁰

Cost

Total cost of health care for children (2002).....	\$79 billion ²¹
----------------------------------------------------	----------------------------

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
- Receipt of hepatitis B vaccine by adolescents
- Dental visits by children
- Receipt of counseling about physical activity by children
- Hospital admissions for pediatric gastroenteritis

In addition, a supplemental measure is also presented:

- Untreated dental caries in children

Effectiveness

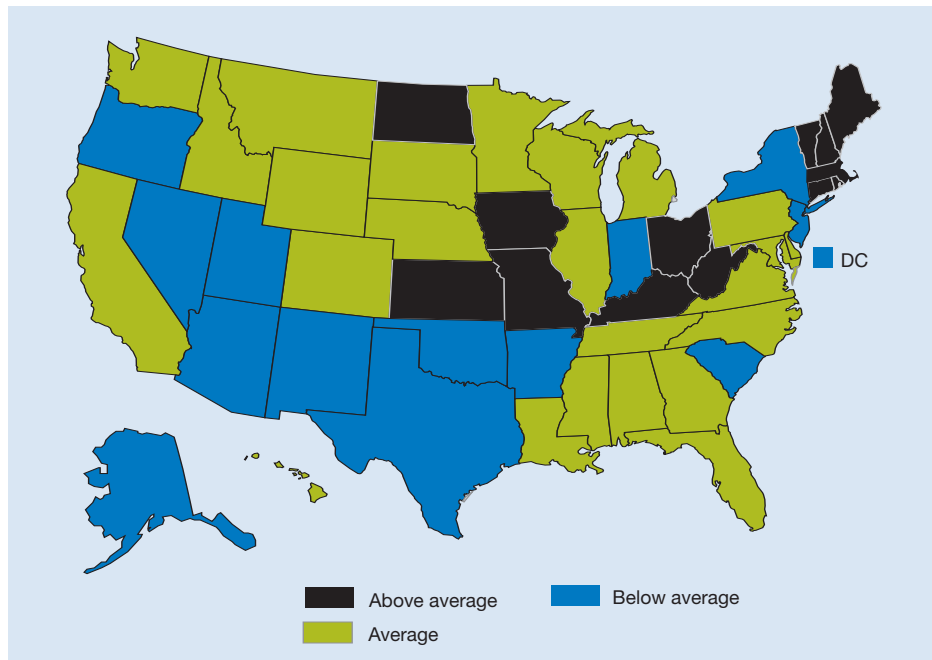
Maternal and Child Health

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 2.16. Women who delivered live births and who received prenatal care in the first trimester of pregnancy, by State, 1999-2002



Source: National Vital Statistics System - Natality, 1999-2002.

Reference population: Women with live births.

Key: Above average = Rate is significantly above the all-States average in each of the 4 years of data (1999-2002). Below average = Rate is significantly below the all-States average in each of the 4 years of data (1999-2002).

Note: "All-States average" is the average of all responding States (51 including DC), which is a separate figure from the national average.

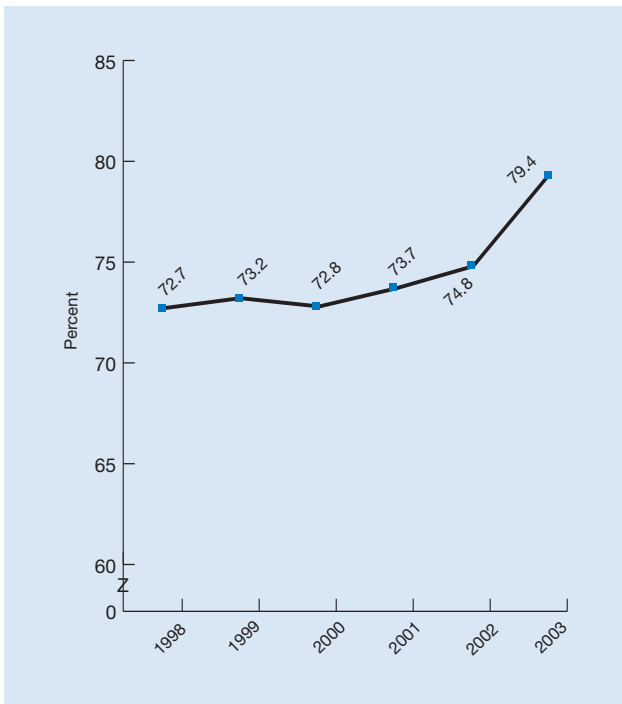
- Thirteen States^{viii} had rates of prenatal care significantly above the all-States average in all 4 years from 1999 to 2002, with a combined average rate of 88.2% in 2002 (Figure 2.16).
- State variation in the percentage of women who delivered live births and who received prenatal care in the first trimester of pregnancy ranged from 69.0% to 91.5% in 2002 with a national average of 83.7%. The Healthy People 2010 target is 90%.

^{viii}The 13 States are North Dakota, Kansas, Iowa, Missouri, Kentucky, Ohio, West Virginia, Connecticut, Rhode Island, Massachusetts, Vermont, New Hampshire, and Maine.

Effectiveness**Maternal and Child Health****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 (DTaP) vaccine, three doses of polio vaccine, one dose of measles-mumps-rubella (MMR) vaccine, three doses of *H. influenzae* type B vaccine, and three doses of hepatitis B vaccine.

Figure 2.17. Children ages 19-35 months who received all recommended vaccines, 1998-2003



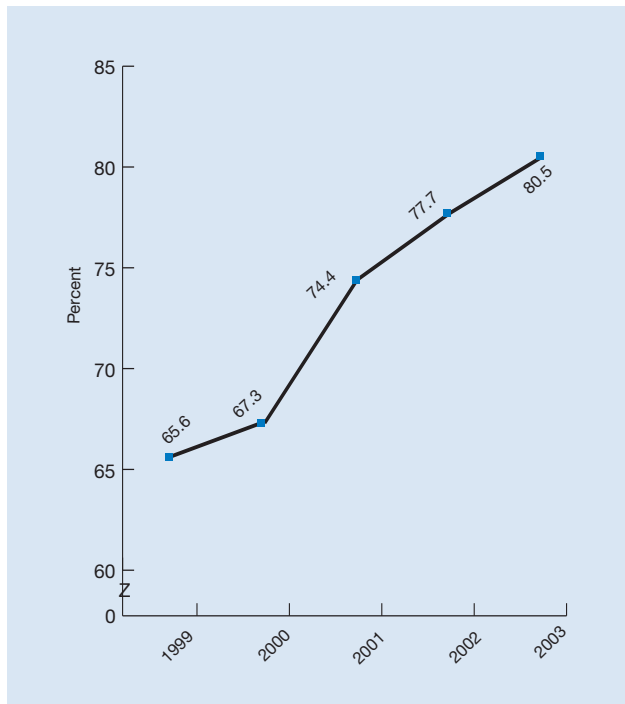
Source: National Immunization Survey, 1998-2003.

- From 1998 to 2003, the percent of children age 19-35 months who received all recommended vaccines increased from 72.7% to 79.4% (Figure 2.17).

Prevention: Receipt of Hepatitis B Vaccine by Adolescents

Hepatitis B is a serious disease caused by a virus that attacks the liver. The virus can cause lifelong infection, cirrhosis (scarring) of the liver, liver cancer, liver failure, and death. All adolescents who have not been immunized against hepatitis B should begin the hepatitis B immunization series.

Figure 2.18. Adolescents ages 13-15 who received three or more doses of hepatitis B vaccine, 1999-2003



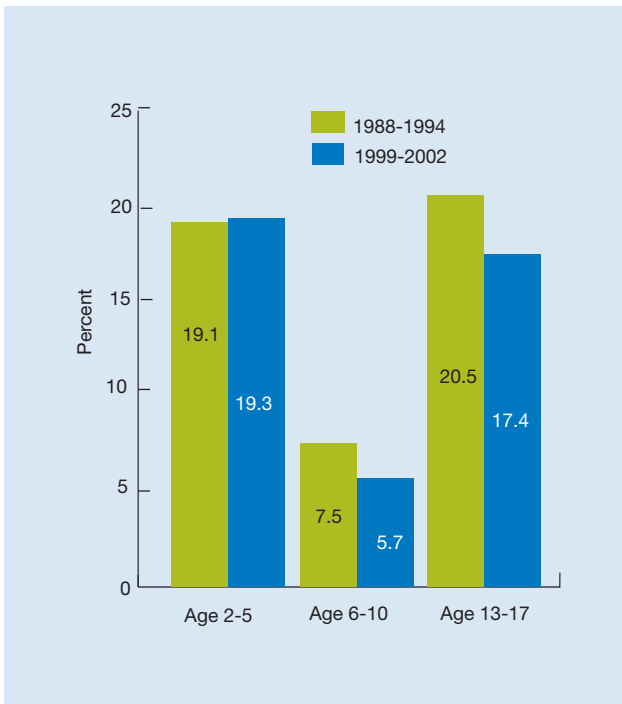
Source: National Health Interview Survey, 1999-2003.

- From 1999 to 2003, the percentage of adolescents ages 13-15 who received 3 or more doses of hepatitis B vaccine increased from 65.6% to 80.5% (Figure 2.18).

Prevention: Children's Dental Care

Untreated dental caries. 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.²²

Figure 2.19. Children ages 2-17 with untreated dental caries, 1988-1994 and 1999-2002



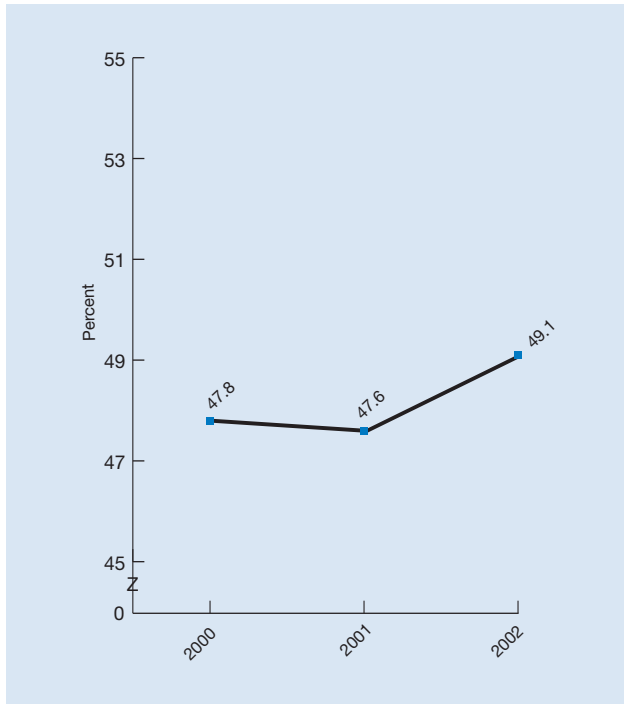
Source: National Health and Nutrition Examination Survey, 1988-1994 and 1999-2002.

Note: Children ages 2-5 are examined for untreated dental caries in their primary teeth; children age 6 and older are examined for dental caries in their permanent teeth.

- Many children continue to have untreated dental caries. In 1999-2002, untreated dental caries in primary teeth were experienced by 19.3% of children ages 2-5 while untreated dental caries in permanent teeth were experienced by 5.7% of children ages 6-10 and 17.4% of children age 13-17 (Figure 2.19). These rates are not significantly different from rates of untreated dental caries observed in the earlier time period (1988-1994).

Dental visits. Regular dental visits help to improve overall oral health and prevent dental caries.

Figure 2.20. Children ages 2-17 with a dental visit in the past year, 2000-2002



Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2000-2002.

- The percentage of children ages 2-17 who visited a dentist in the past year did not change significantly from 2000 to 2002 (Figure 2.20).

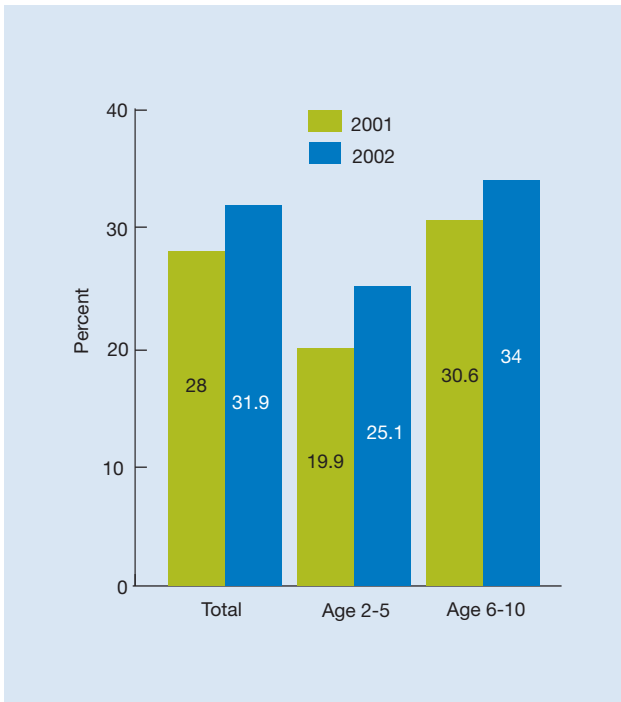
Effectiveness

Maternal and Child Health

Prevention: Counseling About Physical Activity

Lack of physical activity is a major contributor of childhood obesity. The President's Council on Physical Fitness and Sports recommends that children age 5-12 should be physically active for 60 minutes on most or all days. The recommendation for adolescents is 30 minutes a day. Routine promotion of physical activity among young persons is widely recommended.^{23 24}

Figure 2.21. Children ages 2-17 whose parents or guardians reported advice from a doctor or other health provider about amount and kind of physical activity, 2001-2002



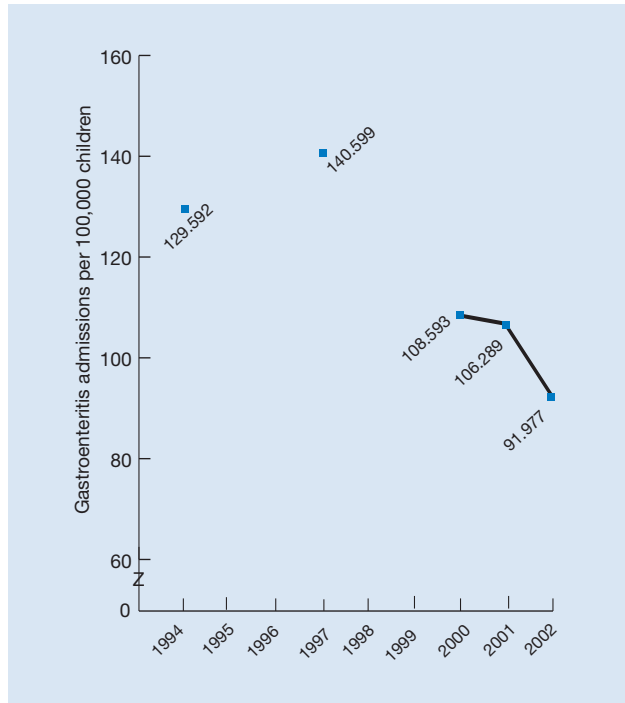
Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2001-2002.

- Most children do not receive counseling from health providers about physical activity.
- From 2001 to 2002, the proportion of children whose parents or guardians reported advice from a health provider about physical activity improved from 28.0% to 31.9% (Figure 2.21).
- Improvements were seen both among children age 2 to 5 and among children age 6 to 17.

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 2.22. Hospital admissions for gastroenteritis per 100,000 population ages 0-17, 1994, 1997, and 2000-2002



Source: Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 1994, 1997, 2000-2002.

Reference population: Children ages 0-17.

- From 1994 to 2002, admissions for pediatric gastroenteritis have fallen by almost one-third, from about 130 to 92 per 100,000 children (Figure 2.22).

Mental Health and Substance Abuse

Importance and Measures

Mortality

Cause of death rank—suicide (2003).....	11th ²
Alcohol-related motor vehicle deaths (2003).....	17,013 ²⁵
Students grades 9-12 who have seriously considered suicide (2003).....	17.3% ²⁶

Prevalence

Americans 12 or older with alcohol and/or illicit drug dependence or abuse (2003).....	21,600,000 ²⁷
Americans 18 or older with serious mental illness (2003).....	19,600,000 ²⁷
American adults with co-occurring serious mental illness and substance dependence or abuse (2003 est.).....	4,200,000 ²⁷
Americans with mental disorders including substance abuse in past year, U.S. (2001-2003)	26.4% ²⁸
Americans with anxiety disorders, U.S. (2001-2003).....	18.2% ²⁸
Americans with mood disorders, U.S. (2001-2003)	9.6% ²⁸
Americans with impulse-control disorders, U.S. (2001-2003).....	6.8% ²⁸

Cost

Direct medical expenditures for substance abuse and mental disorders (2001 est.).....	\$104 billion ²⁹
---------------------------------------------------------------------------------------	-----------------------------

Measures

The NHQR tracks measures for the treatment of clinical depression, serious psychological distress, and substance abuse. The measures for clinical depression include any treatment, practitioner contact for medication management, and the receipt of antidepressant medication both during the first 3 months following initial diagnosis (i.e., the acute phase) and through the continuation treatment phase. 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 measures of mental health and substance abuse treatment:

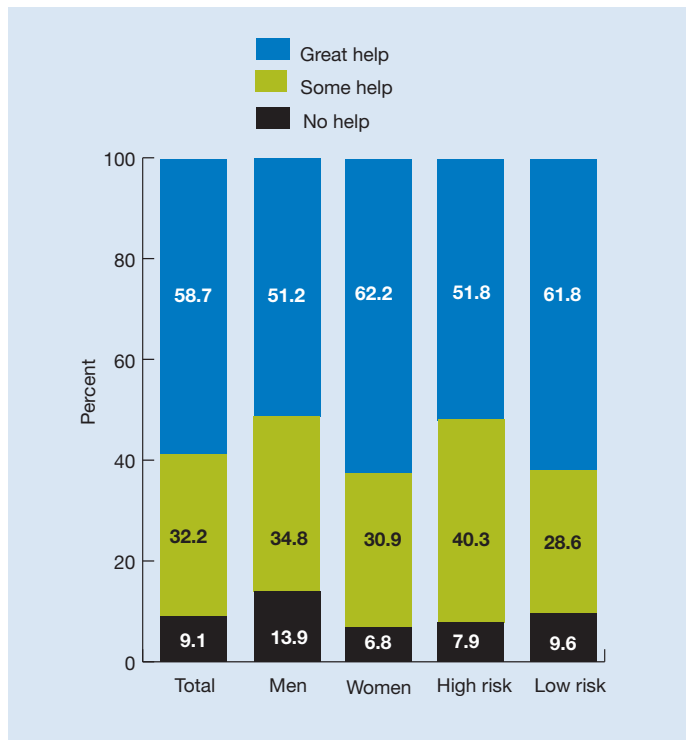
- Degree of helpfulness of mental health treatment
- Receipt of needed substance abuse treatment
- Completion of substance abuse treatment

Findings

Treatment: Degree of Helpfulness of Mental Health Care

Both timeliness and responsiveness to patient needs are important, especially when dealing with depression and potential suicides. In 2002, 48% of the adults age 18 or older who likely had a mental disorder received some kind of mental health treatment (counseling, inpatient, outpatient, and/or prescription medications, from any public or private source) in the past year.

Figure 2.23. Degree of helpfulness of mental health treatment in the past year, by gender and likelihood of having a mental disorder, 2002



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

Reference population: U.S. population age 18 and older who received mental health treatment.

Notes: *Treatment* is defined as having counseling, inpatient care, outpatient care, or prescription medications for problems with emotions, anxiety, or mental health and does not include alcohol or drug treatment. Degree of helpfulness is determined by response to the following question asked of those who received mental health treatment: "How much did the counseling or medicine improve your ability to manage daily activities like those asked about in the previous questions?" Daily activities included controlling emotions around people, thinking clearly, being able to concentrate on something important, going out of the house and getting around on your own, and taking care of your daily responsibilities at work, school, or at home as well as washing, dressing and feeding yourself on your own. *Likelihood of having a mental disorder* is defined as having reported a high level of distress in the past year due to any type of mental problem, which may include general symptoms related to phobia, anxiety, or depression.

- Of the 27 million people in total who received mental health treatment in 2002, 58.7% reported that their treatment was a great help (Figure 2.23).
- Great help from mental health treatment was less likely to be reported by men compared with women and by adults with a likelihood of having a mental disorder compared with adults unlikely to have a mental disorder.

Effectiveness

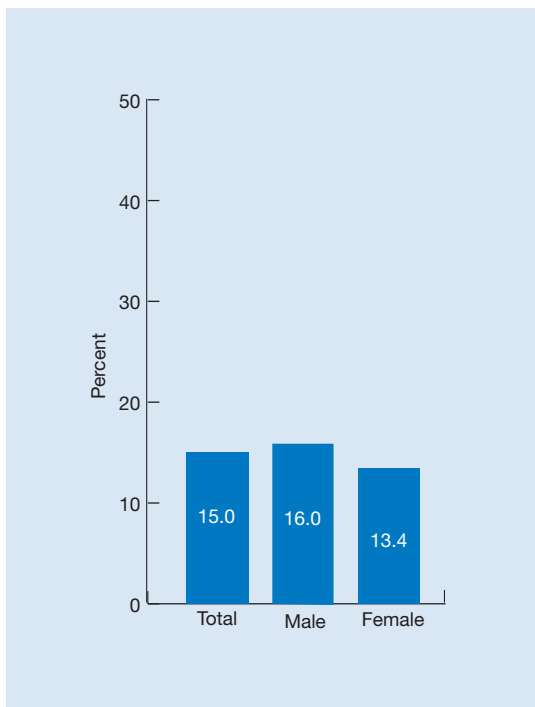
Mental Health and Substance Abuse

Treatment: Receipt and Completion of Substance Abuse Care

Mental disorders and substance abuse are associated with lost productivity³⁰ and with increased health costs for physical illnesses.³¹ Because overall health care costs may be reduced by effective substance abuse and mental health treatment,^{32 33} appropriate receipt and completion of treatment have both clinical and economic implications.

Receipt of needed treatment. Substance abuse requires timely treatment not only because of its health effects but also because of other adverse effects such as physical and domestic violence.

Figure 2.24. People age 12 and over who received needed treatment for illicit drug use, by gender, 2003



Source: SAMHSA, National Survey on Drug Use and Health, 2003.

Reference population: U.S. population age 12 and older who needed substance abuse treatment.

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.

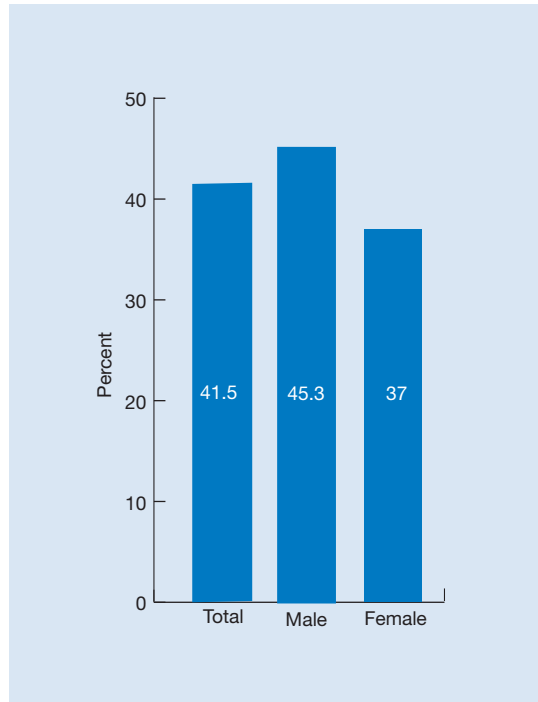
- Overall, only 15% of those who met criteria for needing treatment for illicit drug use actually received it (Figure 2.24).
- Gender differences in receipt of needed substance abuse treatment were not observed.

Effectiveness

Mental Health and Substance Abuse

Completion of substance abuse treatment. People who complete all parts of their treatment plan are more likely to have improvement in their health status.^{34 35}

Figure 2.25. Discharges from substance abuse treatment facilities in which the patient completed substance abuse treatment, by gender, 2002



Source: Substance Abuse and Mental Health Services Administration, Treatment Episode Data Set (TEDS) discharge system, 2002.

Reference population: Discharges age 12 and older from publicly funded substance abuse treatment facilities.

Notes: *Completed treatment* is defined as admissions that completed all parts of their treatment plan or program and does not include those transferred for further treatment. In 2002, 23 States submitted complete data on about 800,000 discharges to SAMHSA's recently established discharge component of the Treatment Episode Data Set. Analyses of the demographic characteristics, service types, and primary substance of abuse found that the admissions in these States did not differ significantly from States not reporting discharge data. The following States provided complete discharge data: California, Colorado, Georgia, Hawaii, Illinois, Iowa, Kansas, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, Montana, Nebraska, New Jersey, Ohio, Oklahoma, Rhode Island, South Carolina, Texas, Utah, and Wyoming.

- Of the 748,000 discharges from specialty substance abuse treatment in 2002, about 42% completed their program (Figure 2.25).
- An additional 9% of discharges were transferred for further treatment, 27% dropped out of treatment, 16% had treatment terminated by the facility, and 6% failed to complete treatment for other or unknown reasons.
- Females were less likely to complete treatment than males.

Respiratory Diseases

Importance and Measures

Mortality

Number of deaths due to lung diseases (2001)	231,545 ³⁶
Number of deaths, influenza and pneumonia combined (2003)	64,847 ²
Cause of death rank, influenza and pneumonia combined (2003).....	7th ²

Prevalence

Americans 18 or over with an asthma attack in past 12 months (2003).....	13,623,000 ³⁷
Americans under 18 with an asthma attack in past 12 months (2003).....	3,975,000 ³⁸

Incidence

Annual number of cases of the common cold in the U.S. (est)	>1 billion ³⁹
Annual number of pneumonia cases (1996).....	4,800,000 ⁴⁰

Cost

Total cost of lung diseases (2005 est.).....	\$139.6 billion ³
Direct medical costs of lung diseases (2005 est.)	\$80.7 billion ³
Total approximate cost of upper respiratory infections (annual)	\$40 billion ⁴¹
Total cost of asthma (2004)	\$27.6 billion ³⁶
Direct medical costs of asthma (2004).....	\$11.5 billion ³⁶

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 four core report measures highlighted in this section are:

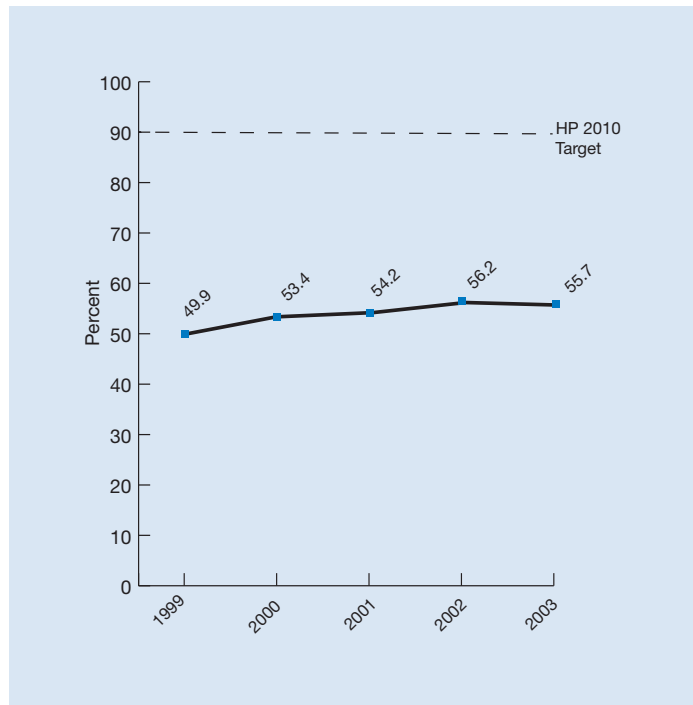
- Pneumococcal vaccination
- Receipt of recommended care for pneumonia
- Receipt of antibiotics for the common cold
- Hospital admissions for pediatric asthma

Findings

Prevention: Pneumococcal Vaccination

Vaccination is an effective strategy for reducing illness and death associated with pneumococcal disease and influenza.⁴²

Figure 2.26. Adults age 65 and over who ever received pneumococcal vaccination, 1999-2003



Source: National Center for Health Statistics, National Health Interview Survey, 1999-2003.

- The percentage of adults age 65 and over who ever received pneumococcal vaccination increased significantly from 49.9% in 1999 to 55.7% in 2003. The Healthy People 2010 target is 90% and is unlikely to be met at this rate of change (Figure 2.26).

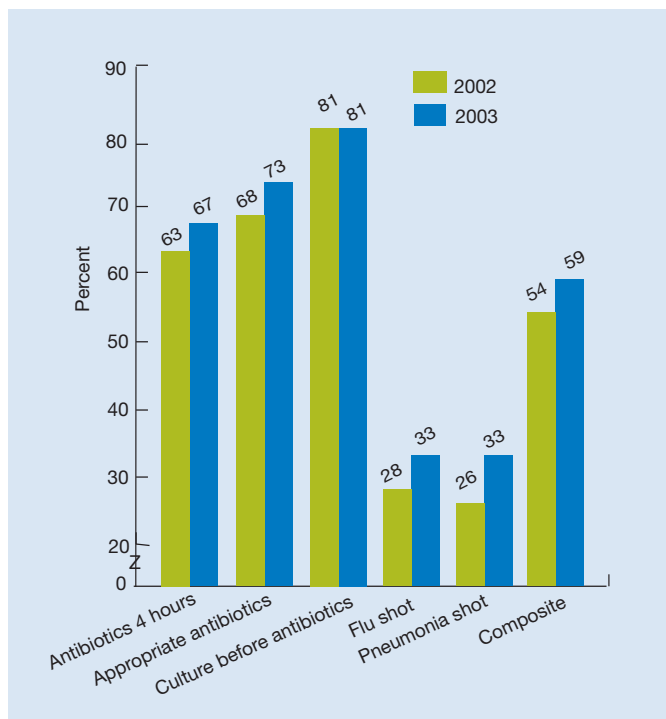
Effectiveness

Respiratory Diseases

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; and 5) pneumonia vaccination. The NHQR tracks receipt of this care for each measure and as an overall composite.^{ix}

Figure 2.27. Medicare patients with pneumonia who received recommended care for pneumonia: overall composite and five components, 2002 and 2003



Source: Centers for Medicare & Medicaid Services, Medicare Quality Improvement Organization Program, 2002 and 2003.

- The overall pneumonia composite measure shows significant improvement in the provision of recommended care for Medicare patients with pneumonia from 54% of the time in 2002 to 59% in 2003.
- All measures showed significant improvement except receipt of blood culture before antibiotics.

^{ix}The pneumonia composite measure is different from that reported in the 2004 NHQR in that two additional QIO measures are added to the composite. For further details, see Chapter 1, Introduction and Methods.

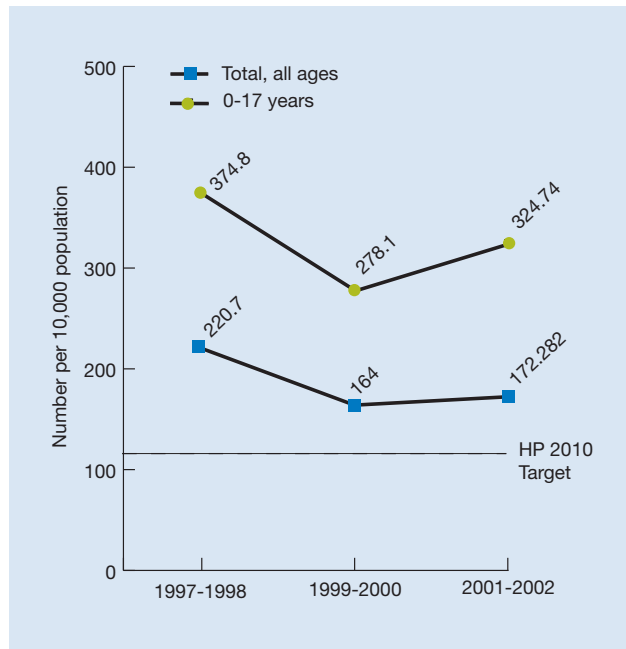
Effectiveness

Respiratory Diseases

Treatment: Receipt of Antibiotics for the Common Cold

Overuse of antibiotics and increasing prevalence of antibiotic-resistant bacterial infections are a particular concern for children because they have the highest rates of antibiotic use and the highest rates of infection with antibiotic-resistant pathogens.⁴³

Figure 2.28. Rate antibiotics prescribed at visits with diagnosis of common cold per 10,000 population, 1997-2002



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, 1998-1999, and 2001-2002.

- From 1997-1998 to 2001-2002, the rate of antibiotics prescribed at visits with a diagnosis of common cold did not change significantly overall for children ages 0-17 or for persons of all ages (Figure 2.28).
- In 2001-2002, children had significantly higher rates (325 per 10,000) of antibiotics prescribed for the common cold than persons of all ages.
- By 2001-2002, the rates for the overall population (172 per 10,000) and for children (325 per 10,000) were much higher than the Healthy People 2010 target of 126.8 antibiotics prescribed at visits with a diagnosis of common cold per 10,000 population.

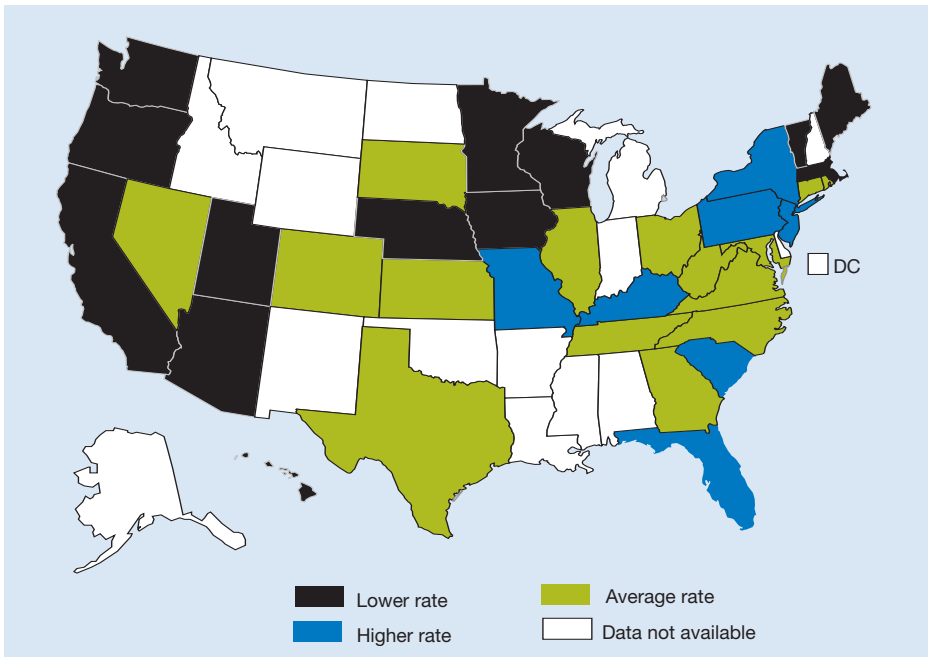
Effectiveness

Respiratory Diseases

Management: Hospital Admissions for Pediatric Asthma

Asthma can be effectively controlled over the long term with recommended medications depending on 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 2.29. State variation in pediatric hospital admissions for asthma per 100,000 population ages 0-17, 2000-2002



Source: Agency for Healthcare Research and Quality, HCUP State Inpatient Databases, 2000-2002.

Note: Not all States are included in HCUP. Differences in asthma prevalence should also be considered when interpreting asthma data for each State.

Key: Lower rate = State has admission rate lower than the national average for at least 2 of the 3 data years (2000-2002). Average rate = State has admission rate not significantly different from the national average or has only 1 year of data collected. Higher rate = State has admission rate higher than the national average for at least 2 of the 3 data years (2000-2002).

- Thirteen States^x had admission rates that were lower than the national average^{xi} in 2 of the 3 data years (2000-2002) (Figure 2.29).
- In 2002, child asthma admission rates varied from 99.5 admissions per 100,000 population for the best performing quartile of States to 250.5 admissions per 100,000 population for the lowest performing quartile of States.

^x The 13 States are Hawaii, Washington, Oregon, California, Utah, Arizona, Nebraska, Minnesota, Iowa, Wisconsin, Vermont, Maine, and Massachusetts.

^{xi} The national average in 2000 was 200.6 admissions per 100,000 population; in 2001, 188.6 admissions per 100,000 population; and in 2002, 187.6 admissions per 100,000 population.

Nursing Home and Home Health Care

Importance and Measures

Demographics

Number of nursing home residents (1999)	1,600,000 ⁴⁴
Number of home health patients (2000)	1,460,000 ⁴⁵
Discharges from nursing homes (1998-1999)	2,500,000 ⁴⁴
Discharges from home health agencies (2000)	7,800,000 ⁴⁵

Cost

Total cost of nursing home services (2003)	≥\$110.8 billion ⁴⁶
Total cost of home health services (2003)	\$40 billion ⁴⁶

Measures

The NHQR tracks 14 measures of nursing home care for both postacute and chronic care residents and 12 measures for home health care that reflect improvement or deterioration during the course of care. Two core report measures in nursing home care and two core report measures in home health care are highlighted in this section:

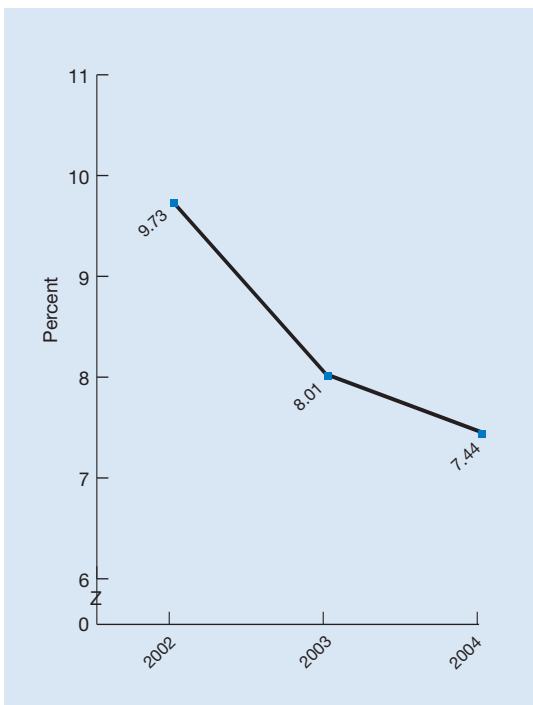
- Use of restraints among chronic care nursing home residents
- Presence of pressure ulcers among nursing home residents
- Improvement in ambulation in home health episodes
- Acute care hospitalization of home health patients

Findings

Management: Use of Restraints Among Chronic Care 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 chemical 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. The Centers for Medicare & Medicaid Services encourage gradual restraint reduction because of the many negative outcomes associated with restraint use.

Figure 2.30. Chronic care nursing home residents with physical restraints, 2002-2004



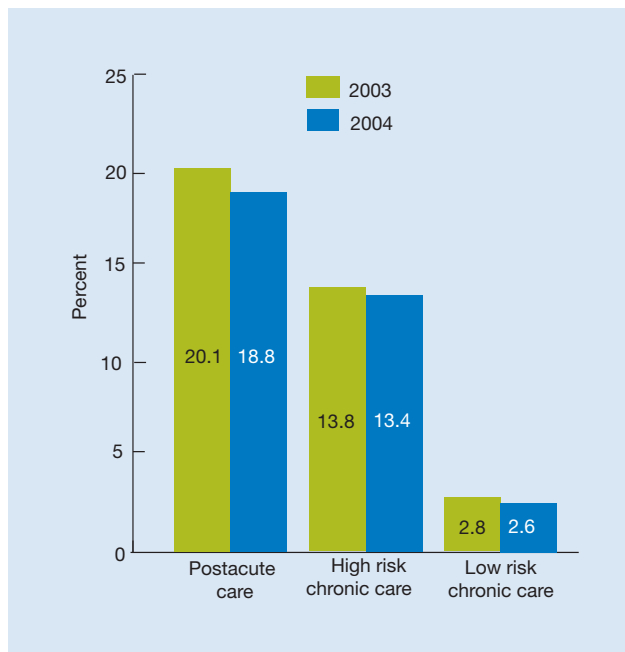
Source: Centers for Medicare & Medicaid Services, Minimum Data Set, 2002-2004. Data are from the third quarter of each calendar year.

- On average, the proportion of residents who are physically restrained decreased by 23% between 2002 and 2004—from 9.7% to 7.4% (Figure 2.30).

Management: Presence of Pressure Ulcers Among Nursing Home Residents

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 2.31. Postacute and chronic care nursing home residents with pressure ulcers, by type of resident, 2003-2004



Source: Centers for Medicare & Medicaid Services, Minimum Data Set, 2003-2004.

- Almost 1 in 5 postacute care residents had pressure sores (Figure 2.31).
- High risk chronic care residents have a fivefold greater risk of having pressure sores on their most recent assessment than low risk residents.^{xiii}
- There were significant improvements in pressure sore measures for all three types of residents between 2003 and 2004. Improvement ranged from 3.0% for high risk chronic care residents to 5.4% for low risk chronic care residents.

^{xiii}*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.

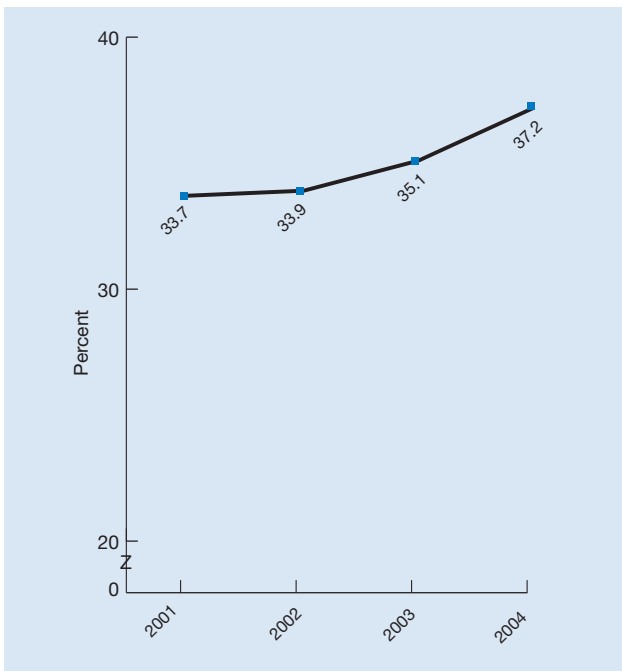
Effectiveness

Nursing Home and Home Health Care

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 2.32. Home health episodes showing ambulation/locomotion improvement, 2001-2004



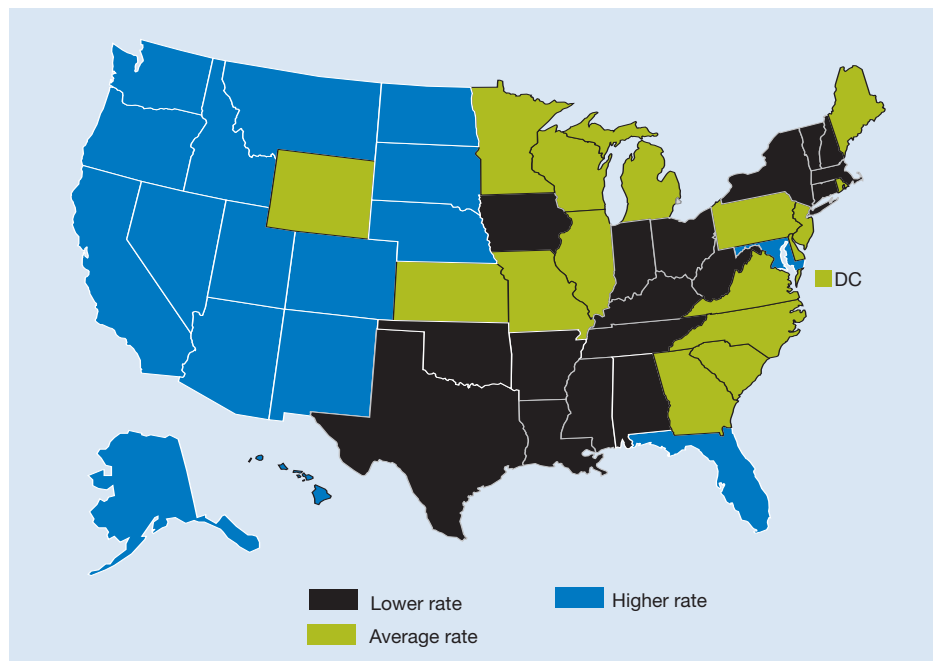
Source: Calculated by the Center for Health Services and Policy Research, University of Colorado, from OASIS data 2001-2004.

- From 2001 to 2004, the proportion of home health episodes showing improvement in ambulation/locomotion increased significantly, from 33.7% to 37.2% (Figure 2.32).

Effectiveness**Nursing Home and Home Health Care****Management: Acute Care Hospitalization of Home Health Patients**

Improvement in acute care hospitalization 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 care. Depending on the severity of the patient's condition, this may not be avoidable even with good home health care. On average, 28% of episodes^{xiii} ended in hospitalization in 2004.

Figure 2.33. State variation in home health episodes with acute care hospitalization, 2003 and 2004



Source: Calculated by the Center for Health Services and Policy Research, University of Colorado, from OASIS data, 2003 and 2004.

Key: Lower rate = State has admission rate lower than the national average for both data years (2003 and 2004). Average rate = State has admission rate not significantly different from the national average in at least 1 data year. Higher rate = State has admission rate higher than the national average for both data years (2003 and 2004). (This comparison includes both statistical significance and 10% plus relative difference.)

- There is considerable State variation in acute care hospitalization, ranging from 18.5% to 39% in 2004.
- Some States did better than other States over the 2-year period 2003-2004. States in the West had consistently lower rates (i.e., fewer hospitalizations) than the national average while States in the South had consistently higher rates (Figure 2.33).

^{xiii}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.

References

1. American Cancer Society. Cancer facts and figures 2005. Atlanta: American Cancer Society; 2005. Available at: <http://www.cancer.org/downloads/STT/CAFF2005f4PWSecured.pdf>. Accessed November 7, 2005.
2. Hoyert DL, Kung HC, Smith BL. Deaths: preliminary data for 2003. National Vital Stat Rep 2005 Feb 28;53(15):1-48. Available at: http://www.cdc.gov/nchs/data/nvsr/nvsr53/nvsr53_15.pdf. Accessed November 7, 2005.
3. National Heart, Lung, and Blood Institute. Fact book fiscal year 2004. Bethesda, MD: U.S. Department of Health and Human Services, National Institutes of Health, National Heart, Lung, and Blood Institute; 2005. Available at: <http://www.nhlbi.nih.gov/about/04factbk.pdf>. Accessed November 7, 2005.
4. U.S. Department of Health and Human Services. Healthy people 2010. Washington, DC: U.S. Government Printing Office; 2000. Available at: <http://www.healthypeople.gov>. Accessed November 7, 2005.
5. U.S. Preventive Services Task Force. Screening for breast cancer: recommendations and rationale. Rockville, MD: U.S. Department of Health and Human Services, Agency for Healthcare Research and Quality; 2002. Available at: <http://www.ahrq.gov/clinic/3rduspstf/breastcancer/brcanrr.htm>. Accessed November 7, 2005.
6. Ries LAG, Eisner MP, Kosary CL, et al. (Eds). SEER cancer statistics review, 1975-2002. Bethesda, MD: U.S. Department of Health and Human Services, National Institutes of Health, National Cancer Institute; 2005. Available at: http://seer.cancer.gov/csr/1975_2002/. Accessed November 17, 2005.
7. Centers for Disease Control and Prevention. National diabetes fact sheet: general information and national estimates on diabetes in the United States, 2002. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention; 2003. Available at: <http://www.diabetes.org/diabetes-statistics/national-diabetes-fact-sheet.jsp>. Accessed November 7, 2005.
8. U.S. Renal Data System.USRDS 2005 Annual data report: atlas of end-stage renal disease in the United States. Bethesda, MD: National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases; 2005. Available at: <http://www.usrds.org/atlas.htm>. Accessed November 7, 2005.
9. American Heart Association. Heart disease and stroke statistics - 2005 update. Dallas, TX: American Heart Association; 2005.
10. Alderman MH, Furberg CD, Kostis JB, et al. Hypertension guidelines: criteria that might make them more clinically useful. Am J Hypertens. 2002 Oct;15(10 Pt 1):917-23.
11. Chobanian AV, Bakris GL, Black HR, et al. The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure: the JNC 7 report. JAMA. 2003 May 21;289(19):2560-72.
12. Jones DW, Hall JE. The national high blood pressure education program: thirty years and counting. Hypertension. 2002 May;39(5):941-2.
13. Centers for Disease Control and Prevention. Basic statistics [fact sheet]. 2005. Available at: <http://www.cdc.gov/hiv/stats.htm>. Accessed June 24, 2005.
14. Glynn M, Rhodes P. Estimated HIV prevalence in the United States at the end of 2003. Abstract 595. National HIV Prevention Conference; 2005 June; Atlanta, GA.
15. National Center for HIV, STD and TB Prevention. Fact sheet - a glance at the HIV/AIDS epidemic. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for HIV, STD, and TB Prevention, Divisions of HIV/AIDS Prevention; 2005. Available at: <http://www.cdc.gov/hiv/PUBS/Facts/At-A-Glance.htm>. Accessed November 7, 2005.
16. Centers for Medicare & Medicaid Services. Fact sheet - Medicaid and Acquired Immune Deficiency Syndrome (AIDS). Baltimore, MD: U.S. Department of Health and Human Services, Center for Medicare & Medicaid Services; 2004. Available at: <http://www.cms.hhs.gov/hiv/hivfs.asp>. Accessed November 7, 2005.
17. Yeargin P, Donnelly R, Weyer D (Eds). Clinical management of the HIV-infected adult: a manual for midlevel clinicians. Rockville, MD: U.S. Department of Health and Human Services, Health Resources and Services Administration, HIV/AIDS Bureau; 2003. Available at: http://www.seatec.emory.edu/clinicalprotocols/clinical_protocols_manual2003.pdf. Accessed November 7, 2005.

18. National Center for Health Statistics. Health, United States, 2004. With chartbook on trends in the health of Americans. Hyattsville, MD: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Health Statistics; 2004. Available at: <http://www.cdc.gov/nchs/data/abus/abus04.pdf>. Accessed November 7, 2005.
19. U.S. Census Bureau. Table 1-RES: Estimates of the resident population by selected age groups for the United States and States and for Puerto Rico: July 1, 2004. U.S. Census Bureau, Population Division; 2005. SC-EST2004-01-RES. Available at: <http://www.census.gov/popest/states/asrh/SC-est2004-01.html>. Accessed November 28, 2005.
20. Hamilton BE, Martin JA, Sutton PD. Births: preliminary data for 2003. Natl Vital Stat Rep. 2004 Nov 23;53(9):1-17.
21. Agency for Healthcare Research and Quality. Total health services-mean and median expenses per person with expense and distribution of expenses by source of payment: United States, 2002. Medical Expenditure Panel Survey component data. Rockville, MD: U.S. Department of Health and Human Services, Agency for Healthcare Research and Quality; 2005.
22. U.S. Department of Health and Human Services. Oral health in America: a report of the Surgeon General. Rockville, MD: U.S. Department of Health and Human Services, National Institutes of Health, National Institute of Dental and Craniofacial Research; 2000. Available at: <http://silk.nih.gov/public/hck1ocv.@www.surgeon.fullrpt.pdf>. Accessed November 14, 2005.
23. U.S. Preventive Services Task Force. Guide to clinical preventive services. 2nd edition. Rockville, MD: U.S. Department of Health and Human Services, Agency for Healthcare Research and Quality; 1996. Available at: <http://www.ahrq.gov/clinic/cpsix.htm>. Accessed May 6, 2005.
24. Centers for Disease Control and Prevention. Promoting better health for young people through physical activity and sports: a report to the President from the Secretary of Health and Human Services and the Secretary of Education. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention; 2000. Available at: <http://www.fitness.gov/betterhealth/ppar.pdf>. Accessed November 14, 2005.
25. National Highway Traffic Safety Administration. Traffic safety facts 2003 - alcohol. Washington, DC: U.S. Department of Transportation; 2003. Available at: <http://www-nrd.nhtsa.dot.gov/pdf/nrd-30/NCSA/TSF2003/809761.pdf>. Accessed July 26, 2005.
26. Grunbaum JA, Kann L, Kinchen S, et al. Youth risk behavior surveillance — United States, 2003. MMWR. 2004 May 21;53(SS02);1-96. Available at: <http://www.cdc.gov/mmwr/preview/mmwrhtml/ss5302a1.htm>. Accessed August 9, 2005.
27. Substance Abuse and Mental Health Services Administration. Results from the 2003 National Survey on Drug Use and Health: national findings. Rockville, MD: U.S. Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, Office of Applied Studies; 2004. NSDUH Series H-25, DHHS Pub. No. SMA 03-3964. Available at: <http://www.oas.samhsa.gov/nhsda/2k3nsduh/2k3Results.htm>. Accessed November 7, 2005.
28. Demyttenaere K, Bruffaerts R, Posada-Villa J, et al. Prevalence, severity, and unmet need for treatment of mental disorders in the World Health Organization World Mental Health Surveys. JAMA. 2004 Jun 2;291(21):2581-90.
29. Mark T, Coffey RM, McKusick D, et al. National expenditures for mental health services and substance abuse treatment, 1991-2001. Rockville, MD: U.S. Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, Center for Substance Abuse Treatment, Center for Mental Health Services; 2005. DHHS Pub. No. SMA 05-3999. Available at: <http://www.samhsa.gov/spendingestimates/SEPGenRpt013105v2BLX.pdf>. Accessed November 7, 2005.
30. Rouse BA (Ed.). Substance Abuse and Mental Health Services Administration (SAMHSA) statistics source book. U.S. Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, Office of Applied Studies; 1998. DHHS Publication No. SMA 98-3170. Available at: <http://www.whitehousedrugpolicy.gov/publications/pdf/98samhsa2.pdf>. Accessed November 7, 2005.
31. Mertens JR, Lu YW, Parthasarathy S, et al. Medical and psychiatric conditions of alcohol and drug treatment patients in an HMO: comparison with matched controls. Arch Intern Med. 2003 Nov 10;163(20):2511-7.
32. Lave J. The cost offset effect. In: Fogel BS, Furino A, Gottlieb GL. Mental health policy for older Americans: protecting minds at risk. Washington, DC: American Psychiatric Press; 1990.
33. Luchansky B, Longhi D. Cost savings in Medicaid medical expenses: an outcome of publicly funded chemical dependency treatment in Washington State. Washington State Department of Social and Health Services; 1997. Briefing Paper No. 4.29. Available at: <http://www1.dshs.wa.gov/pdf/ms/rda/research/4/30.pdf>. Accessed November 7, 2005.

34. Gerstein DR, Harwood HJ (Eds.). *Treating drug problems: a study of the evolution, effectiveness, and financing of public and private drug treatment systems*. Washington, DC: National Academies Press; 1990.
35. Wallace AE, Weeks WB. Substance abuse intensive outpatient treatment: does program graduation matter? *J Subst Abuse Treat*. 2004 Jul;27(1):27-30.
36. National Heart, Lung, and Blood Institute. *Morbidity & mortality: 2004 chart book on cardiovascular, lung, and blood diseases*. U.S. Department of Health and Human Services, National Institutes of Health, National Heart, Lung, and Blood Institute; 2004. Available at: http://www.nhlbi.nih.gov/resources/docs/04_chtbk.pdf. Accessed November 7, 2005.
37. Lethbridge-Cejku M, Vickerie J. Summary health statistics for U.S. adults: National Health Interview Survey, 2003. *Vital Health Stat*. 10. 2005 Jul(225). Available at: http://www.cdc.gov/nchs/data/series/sr_10/sr10_225.pdf. Accessed November 7, 2005.
38. Dey AN, Bloom B. Summary health statistics for U.S. children: National Health Interview Survey, 2003. *Vital Health Stat*. 10. 2005 Mar(223):1-78. Available at: http://www.cdc.gov/nchs/data/series/sr_10/sr10_223.pdf. Accessed November 7, 2005.
39. National Institute of Allergies and Infectious Diseases. *The common cold [fact sheet]*. Bethesda, MD: U.S. Department of Health and Human Services, National Institutes of Health, National Institute for Allergies and Infectious Diseases; 2004. Available at: <http://www.niaid.nih.gov/factsheets/cold.htm>. Accessed November 7, 2005.
40. American Lung Association. *Pneumonia fact sheet*. 2005. Available at: <http://www.lungusa.org/site/pp.asp?c=dvLUK9O0E&b=35692#four>. Accessed November 7, 2005.
41. Fendrick AM, Monto AS, Nightengale B, et al. The economic burden of non-influenza-related viral respiratory tract infection in the United States. *Arch Intern Med*. 2003 Feb 24;163(4):487-94. Available at: <http://archinte.ama-assn.org/cgi/content/full/163/4/487>. Accessed July 20, 2004.
42. Davis MM. Race-based immunization recommendations and the potential to reduce health disparities. *JAMA*. 2004 May 12;291(18):2253-2255.
43. Perz JF, Craig AS, Coffey CS, et al. Changes in antibiotic prescribing for children after a community-wide campaign. *JAMA*. 2002 Jun 19;287:3103-9.
44. Jones A. National Nursing Home Survey: 1999 summary. *Vital Health Stat*. 2002 Jun(152):1-116.
45. National Center for Health Statistics. *National home and hospice care data. Data highlights—selected tables, charts, and graphs. Trends from 1992, 1994, 1996, 1998, and 2000*. Hyattsville, MD: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Health Statistics; 2004. Available at: ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Datasets/NHHCS/Trends/TABLE1HHC2000.pdf. Accessed November 4, 2004.
46. Centers for Medicare & Medicaid Services. *NHE tables: table 2: national health expenditures aggregate amounts and average annual percent change, by type of expenditure: selected calendar years 1980-2003*. 2004. Baltimore, MD: Centers for Medicare & Medicaid Services; 2005. Available at: <http://www.cms.hhs.gov/statistics/nhe/historical/t2.asp>. Accessed May 31, 2005.

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 that die each year from medical errors (1999 estimate)	44,000-98,000 ¹
Number of Americans that die in the hospital each year due to 18 types of medical injuries (2000 estimate).....	at least 32,000 ²

Cost

Cost attributable to medical errors (in lost income, disability, and health care costs) (1999 estimate)	\$17 billion–\$29 billion ¹
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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 section highlights six core report measures relating to adverse events and postoperative complications of care, hospital-acquired (nosocomial) bloodstream infections, and medication errors:

- Postoperative venous thromboembolic events
- Postoperative hip fracture
- Adverse events associated with central venous catheters
- Iatrogenic pneumothorax
- Hospital-acquired bloodstream infections in ICU patients
- Inappropriate use of medications by the elderly

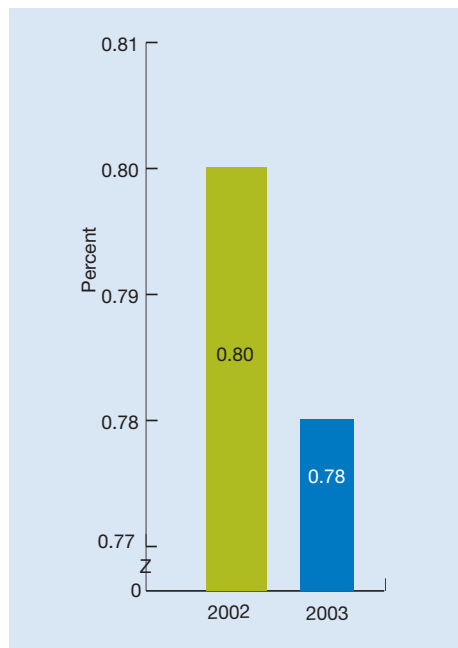
Findings

Adverse Events and Postoperative Complications of Care

Various adverse events and complications can occur during episodes of care. Although some of the events may be related to a patient's underlying condition, many of them can be avoided if adequate care is provided. Patients are especially vulnerable to adverse events during and right after surgery. In addition, the risk of complications during the performance of medical procedures may, in part, be related to the underlying severity of illness of patients who require procedures such as the placement of central venous catheters (CVCs).

Postoperative venous thromboembolic events. After surgery, patients are at higher risk for developing blood clots in their legs. This risk can be reduced by getting patients to walk as soon as possible after surgery and by giving patients medications and treatments that prevent blood clots.

Figure 3.1. Surgical patients with postoperative venous thromboembolic event, 2002 and 2003



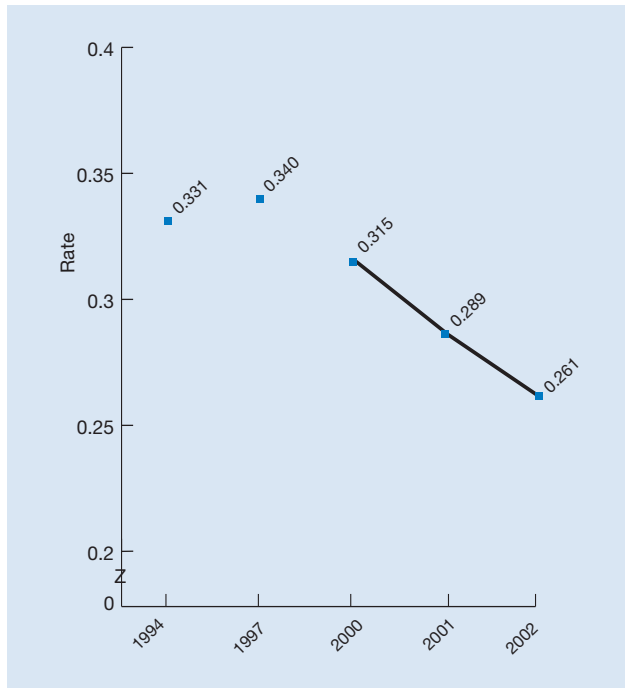
Source: Centers for Medicare & Medicaid Services, Medicare Patient Safety Monitoring System, 2002-2003.

- From 2002 to 2003, the percentage of surgical patients with postoperative venous thromboembolic events fell from 0.80% to 0.78% (Figure 3.1). This change was not significant.

Patient Safety

Postoperative hip fracture. After surgery, some patients may be at risk of falling, which can result in broken bones. This risk can be reduced by raising bed rails, monitoring ambulation, and removing items from the room that could cause a patient to trip.

Figure 3.2. Postoperative hip fracture per 1,000 adult surgical patients, 1994, 1997, 2000-2002

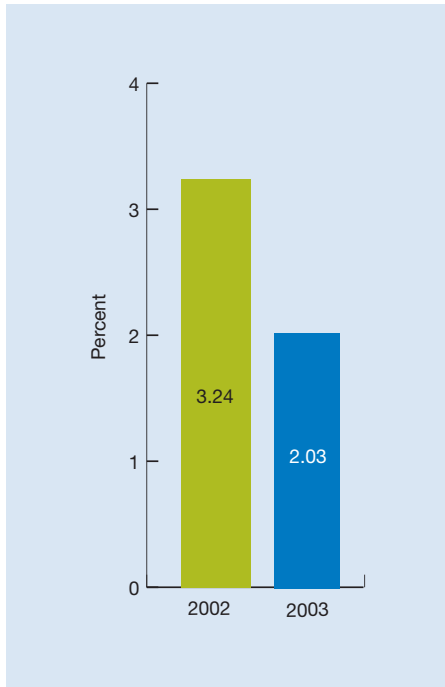


Source: Agency for Healthcare Research and Quality, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 1994, 1997, 2000-2002.

- From 1994 to 2002, the rate of postoperative hip fracture among adult surgical patients did not change significantly (Figure 3.2).

Adverse events associated with central venous catheters. Inserting a CVC into the great vessels can result in a number of non-infection adverse events.

Figure 3.3. Central venous catheter placements with associated mechanical adverse events, 2002-2003

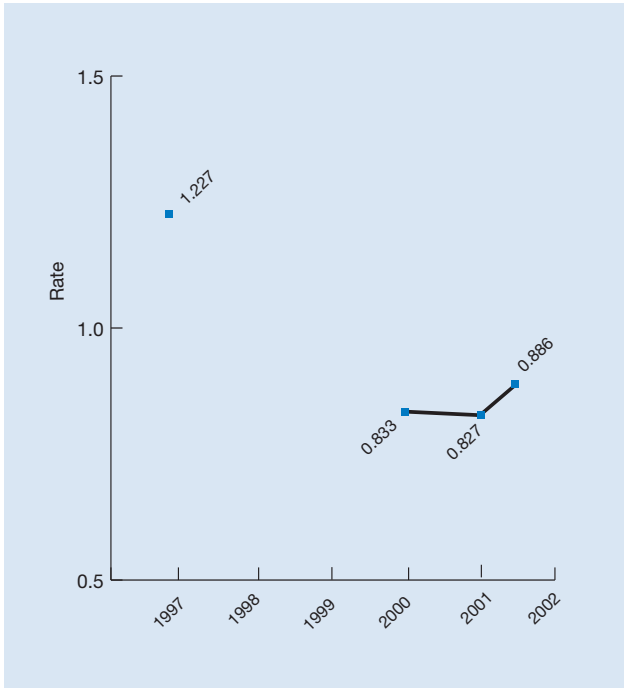


Source: Centers for Medicare & Medicaid Services, Medicare Patient Safety Monitoring System, 2002-2003.

- From 2002 to 2003, the percentage of CVC placements with associated mechanical adverse events decreased significantly from 3.24% to 2.03% (Figure 3.3).

Iatrogenic pneumothorax. A number of medical procedures can accidentally puncture a lung.

Figure 3.4. Iatrogenic pneumothorax per 1,000 discharges, 1997, 2000-2002



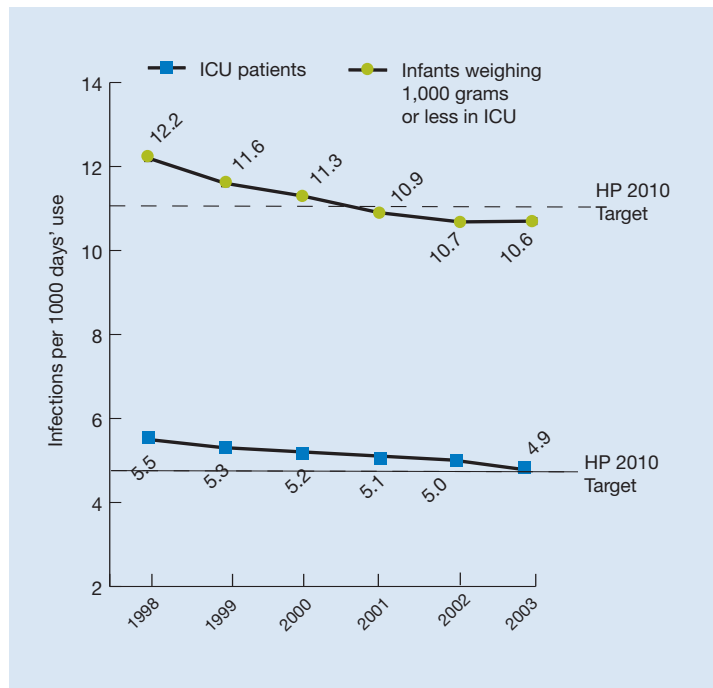
Source: Agency for Healthcare Research and Quality, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 1997, 2000-2002.

- From 1997 to 2002, the rate of iatrogenic pneumothorax decreased from 1.2 to 0.9 per 1,000 discharges (Figure 3.4).

Hospital-Acquired Bloodstream Infections in ICU Patients

Infections acquired as a result of medical treatment, or nosocomial infections, are one of the most serious patient safety concerns. This is especially true in certain hospital settings, such as intensive care units (ICUs), and for some procedures, such as central venous catheters.

Figure 3.5. Central line-associated bloodstream infection in ICU patients, 1998-2003



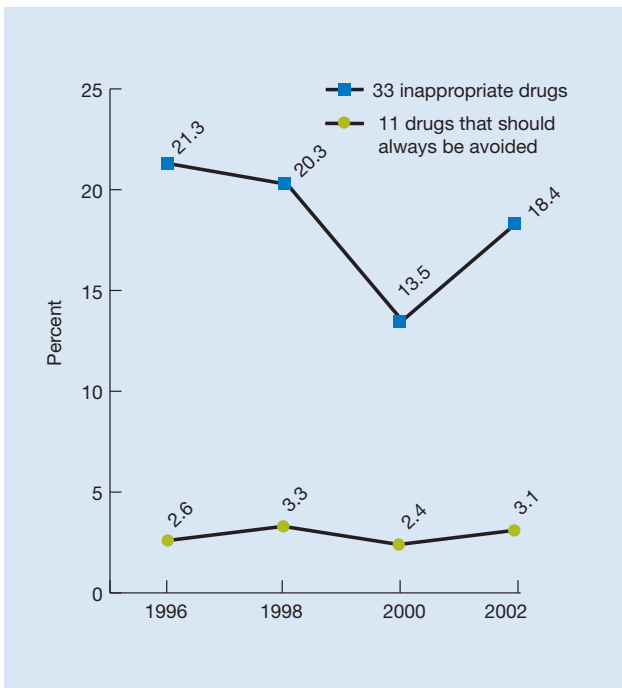
Source: Centers for Disease Control and Prevention, National Nosocomial Infection Surveillance System, 1998-2003.

- Hospital-acquired infections in ICUs have gradually declined from 1998 to 2003 (Figure 3.5). The Healthy People 2010 target for central line-associated bloodstream infection among ICU patients (4.8 infections per 1,000 days' use) is close to being met.
- The Healthy People 2010 target for bloodstream infection among infants weighing 1,000 grams or less in ICUs (11.0 infections per 1,000 days' use) was met in 2001.

Inappropriate Use of Medications by the Elderly

Adverse drug events can result from errors in prescribing or administering medication or patient noncompliance.⁴ Examination of the extent to which medicines that are inappropriate and potentially harmful to patients are prescribed is one way to assess medication safety.

Figure 3.6. Inappropriate use of medications by the elderly, 1996-2002



Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 1996-2002.

- The percentage of community dwelling elderly Americans who had at least 1 of the 33 drugs considered potentially inappropriate for the elderly⁵ improved significantly from 21.3% in 1996 to 18.4% in 2002 (Figure 3.6).
- The percentage of community dwelling elderly who had 1 of 11 drugs that should always be avoided by the elderly remained at about 3% over the 6-year time period between 1996 and 2002.

References

1. Institute of Medicine. *To err is human: building a safer health system*. Washington, DC: National Academies Press; 1999.
2. Zhan C, Miller MR. Excess length of stay, charges, and mortality attributable to medical injuries during hospitalization. *JAMA*. 2003 Oct 8;290(14):1868-74.
3. Institute of Medicine. *Patient safety: achieving a new standard of care*. Washington, DC: National Academies Press; 2004.
4. General Accounting Office. *Adverse drug events: substantial problem but magnitude uncertain*. Statement of Janet Heinrich. Testimony before the Committee on Health, Education, Labor, and Pensions, U.S. Senate. Washington, DC; 2000 February 1. Available at: <http://www.gao.gov/new.items/he00053t.pdf>. Accessed June 8, 2004.
5. Zhan C, Sangl J, Bierman AS, et al. Potentially inappropriate medication use in the community-dwelling elderly: findings from the 1996 Medical Expenditure Panel Survey. *JAMA*. 2001 Dec 12;286(22):2823-9.

Chapter 4. Timeliness

Timeliness is the health care system's capacity to provide health care quickly after a need is recognized. Timeliness¹ is one of the six dimensions of quality established by the Institute of Medicine as a priority for improvement in the health care system.² 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 financial consequences for patients.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

Cost

- Early care for comorbid conditions has been shown to reduce hospitalization rates and costs for Medicare beneficiaries.⁷
- Some research suggests that, over the course of 30 years, the costs of treating diabetic complications can approach \$50,000 per patient.⁸ Early care for complications in patients with diabetes can reduce overall costs of the disease.⁹
- Timely outpatient care can reduce admissions for pediatric asthma, which account for \$835 million in total hospitalization charges annually.^{10 11}

Measures

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

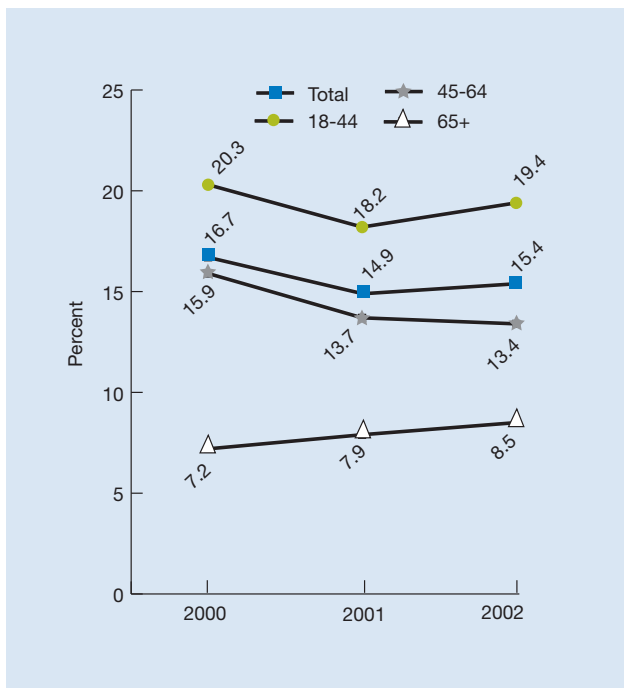
- Getting care for illness or injury as soon as wanted
- Emergency department visits in which the patient left without being seen
- Time to initiation of thrombolytic therapy for heart attack patients

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 age 18 and over who reported sometimes or never getting care for illness or injury as soon as wanted in the past year, by age group, 2000-2002



Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2000-2002.

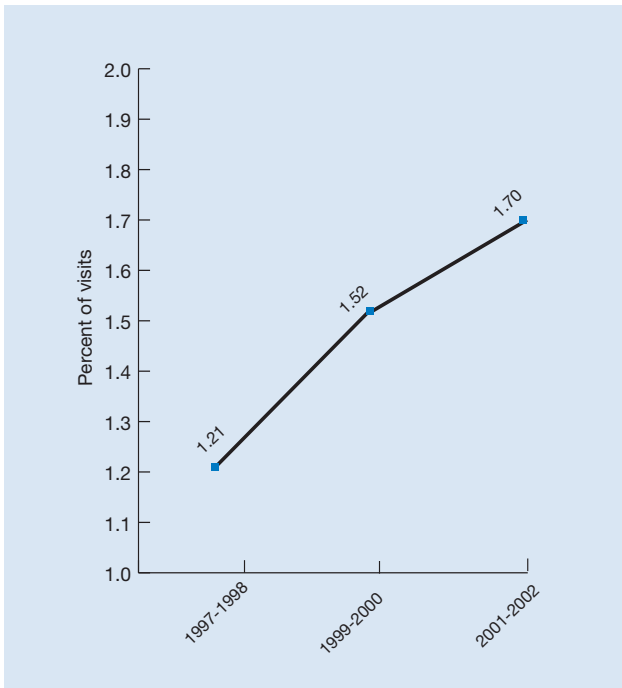
- About 15% of adults report that they sometimes or never get care for illness or injury as soon as wanted (Figure 4.1). This rate did not change significantly from 2000 to 2002 overall or for any age group.
- In all 3 years, the proportion of adults who report that they sometimes or never get care for illness or injury as soon as wanted was lower among those age 45 to 64 and age 65 and older compared with those age 18 to 44.

Timeliness

Emergency Department Visits in Which the Patient Left Without Being Seen

In 2001, patients visiting emergency departments in the United States spent an average of 3.2 hours waiting to be seen. This may be a result of the 20% increase in ED visit volumes over the past 10 years as the number of ED facilities has decreased by 15%.¹² Although there are many reasons that may lead a patient seeking care in an ED to leave without being seen, long waits tend to exacerbate this problem.

Figure 4.2. Emergency department visits in which the patient left without being seen, 1997-1998, 1999-2000, and 2001-2002



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

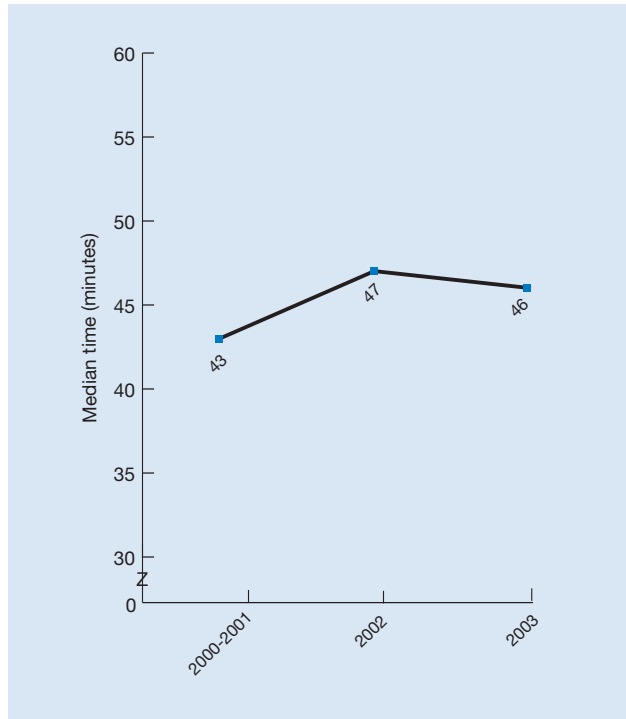
- From 1997-1998 to 2001-2002, the overall percentage of emergency department visits in which the patient left before being seen increased from 1.2% to 1.7% (Figure 4.2).

Timeliness

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.^{13 14 15}

Figure 4.3. Median time (minutes) from arrival of Medicare heart attack patients to initiation of thrombolytic therapy, 2000-2003



Source: Centers for Medicare & Medicaid Services, Medicare Quality Improvement Organization Program, 2000-2003.

Note: This measure is assessed for patients with ST segment elevation or left bundle branch block on the electrocardiogram (ECG) performed closest to the hospital arrival time.

- Among heart attack patients with Medicare, the median time from hospital arrival to the initiation of thrombolytic therapy was 46 minutes in 2003, similar to the previous year (Figure 4.3).
- The median time to the initiation of therapy with thrombolytic agents remains well above the national target of 30 minutes.¹⁶

References

1. Berry LL, Seiders K, Wilder SS. Innovations in access to care: a patient-centered approach. *Ann Intern Med.* 2003 Oct 7;139(7):568-74.
2. Institute of Medicine. *Crossing the quality chasm: a new health system for the 21st century.* Washington, DC: National Academies Press; 2001; pp. 53-54.
3. Leddy KM, Kaldenberg DO, Becker BW. Timeliness in ambulatory care treatment. An examination of patient satisfaction and wait times in medical practices and outpatient test and treatment facilities. *J Ambul Care Manage.* 2003 Apr-Jun;26(2):138-49.
4. Schellinger PD, Warach S. Therapeutic time window of thrombolytic therapy following stroke. *Curr Atheroscler Rep.* 2004 Jul;6(4):288-94.
5. Kwan J, Hand P, Sandercock P. Improving the efficiency of delivery of thrombolysis for acute stroke: a systematic review. *QJM.* 2004 May;97(5):273-9.
6. Kinchen KS, Sadler J, Fink N, et al. The timing of specialist evaluation in chronic kidney disease and mortality. *Ann Intern Med.* 2002 Sep 17;137(6):479-86.
7. Himelhoch S, Weller WE, Wu AW, et al. Chronic medical illness, depression, and use of acute medical services among Medicare beneficiaries. *Med Care.* 2004 Jun;42(6):512-21.
8. Caro JJ, Ward AJ, O'Brien JA. Lifetime costs of complications resulting from type 2 diabetes in the U.S. *Diabetes Care.* 2002 Mar;25(3):476-81.
9. Ramsey SD, Newton K, Blough D, et al. Patient-level estimates of the cost of complications in diabetes in a managed-care population. *Pharmacoeconomics.* 1999 Sep;16(3):285-95.
10. Mellon M, Parasuraman B. Pediatric asthma: improving management to reduce cost of care. *J Manag Care Pharm.* 2004 Mar-Apr;10(2):130-41.
11. Owens PL, Thompson J, Elixhauser A, et al. *Care of children and adolescents in U.S. hospitals.* HCUP Fact Book No. 4. Rockville, MD: U.S. Department of Health and Human Services, Agency for Healthcare Research and Quality; 2003. Available at: <http://www.ahrq.gov/data/hcup/factbk4/factbk4.pdf>. Accessed May 10, 2005.
12. McCraig, LF; Burt, CW; National Hospital Ambulatory Medical Care Survey: 2002 emergency department summary. *Adv Data.* 2004 Mar 18(340):1-34.
13. Gurwitz JH, McLaughlin TJ, Willison DJ, et al. Delayed hospital presentation in patients who have had acute myocardial infarction. *Ann Intern Med.* 1997 Apr 15;126(8):593-9.
14. Kloner RA, Rezkalla SH. Cardiac protection during acute myocardial infarction: where do we stand in 2004? *J Am Coll Cardiol.* 2004 Jul 21;44(2):276-86.
15. American Heart Association. *Know the facts, get the stats. Our guide to heart disease, stroke, and risks.* Dallas, TX: American Heart Association; 2004. Available at: <http://www.americanheart.org/downloadable/heart/1106341997945KnowFctSheet05.pdf>. Accessed November 7, 2005.
16. Antman EM, Anbe DT, Armstrong PW, et al. ACC/AHA guidelines for the management of patients with ST-elevation myocardial infarction—executive summary: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (Writing Committee to Revise the 1999 Guidelines for the Management of Patients With Acute Myocardial Infarction). *Circulation.* 2004 Aug 3;110(5):588-636.

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 Patient centeredness “encompasses qualities of compassion, empathy, and responsiveness to the need, 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^{3 4} and promoting patients to actively participate in patient-provider interactions⁵ have been shown to improve the health status of patients.
- A patient centered approach has been shown to lessen the symptom burden on patients.⁶
- Patient centered care encourages patients to comply with and adhere to treatment regimens.^{7 8}
- Patient centered care can reduce the chance of misdiagnosis due to poor communication.⁹

Cost

- Patient centeredness has been shown to reduce both underuse and overuse of medical services.¹⁰
- Patient centeredness can reduce the strain on system resources or save money by reducing the number of diagnostic tests and referrals.^{11 12}
- Although some studies have shown that being patient centered reduces costs and use of health service resources,¹³ others have shown that patient centeredness increases costs to providers, especially in the short run.¹⁴

Measures

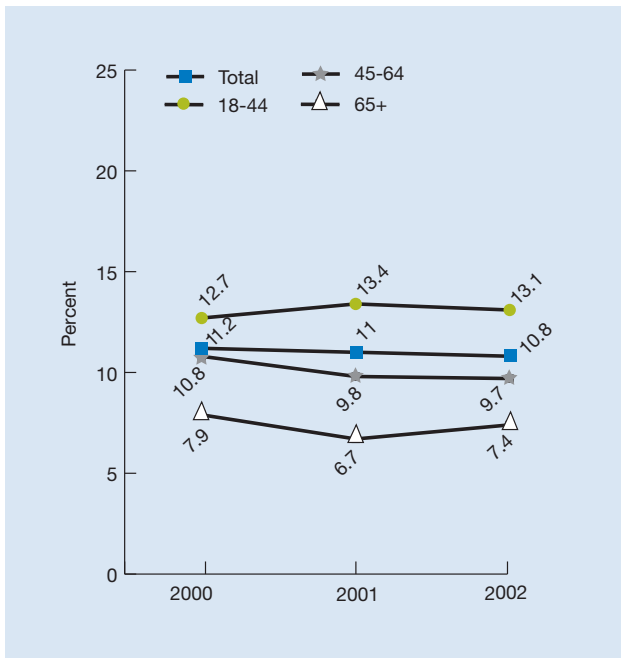
The NHQR tracks four measures of the patient experience of care. The core report measure is a composite measure of these measures which include patient assessments of how often their provider listened carefully to them, explained things clearly, respected what they had to say, *and* spent enough time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

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. Adults whose health providers sometimes or never listened carefully, explained things clearly, respected what they had to say, and spent enough time with them by age, 2000-2002



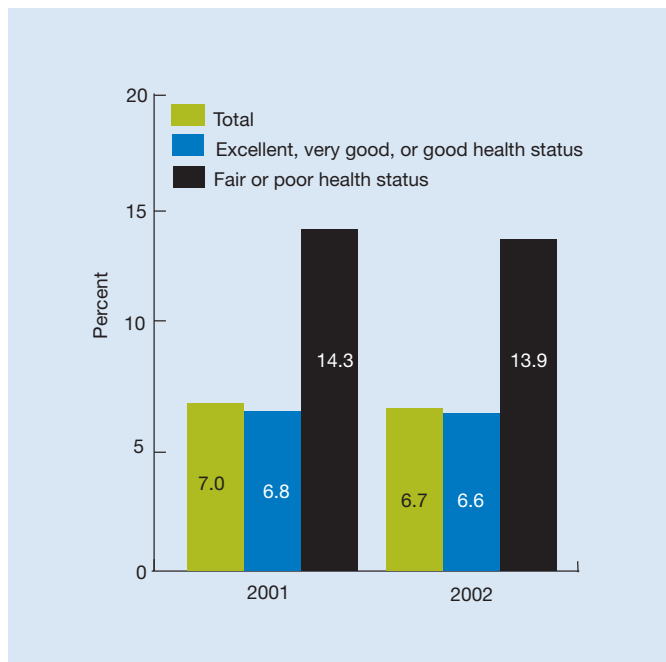
Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2000-2002.

- In 2002, 10.8% of adults reported that their health providers sometimes or never listened carefully, explained things clearly, respected what they had to say, and spent enough time with them (Figure 5.1).
- In all 3 data years, this proportion was lower among adults age 45 to 64 and 65 and over compared with adults age 18 to 44.
- Between 2000 and 2002, there was not a significant change in this percentage for any age group or the total population.

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 decisionmaking. Optimal communication in children's health care can therefore have a significant impact on receipt of high quality care and subsequent health status.

Figure 5.2. Children whose parents or guardians report that their child's health providers sometimes or never listened carefully, explained things clearly, respected what they had to say, and spent enough time with them, by health status, 2001-2002



Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2001-2002.

- In 2002, 6.7% of parents and guardians reported that their child's health providers sometimes or never listened carefully, explained things clearly, respected what they had to say, and spent enough time with them (Figure 5.2). This proportion is significantly lower than the proportion of adults (10.8%) that report encountering these patient communication problems themselves.
- In both years, this proportion was higher among children in fair or poor health compared with children in excellent, very good, or good health.
- Between 2001 and 2002, there was not a significant change in this proportion for children of either health status, or the total child population.

References

1. Institute of Medicine. *Envisioning the national health care quality report*. Washington, DC: National Academies Press; 2001.
2. Institute of Medicine. *Crossing the quality chasm: a new health system for the 21st century*. Washington, DC: National Academies Press; 2001.
3. Stewart M, Brown JB, Donner A, et al. The impact of patient-centered care on outcomes. *J Fam Pract*. 2000 Sep;49(9):796-804.
4. Anderson EB. Patient-centeredness: a new approach. *Nephrol News Issues*. 2002 Nov;16(12):80-2.
5. Michie S, Miles J, Weinman J. Patient-centeredness in chronic illness: what is it and does it matter? *Patient Education and Counseling*. 2003;51:197-206.
6. Little P, Everitt H, Williamson I, et al. Observational study of effect of patient centredness and positive approach on outcomes of general practice consultations. *BMJ*. 2001 Oct 20;323(7318):908-11.
7. Beck R, Daughtridge R, Sloane PD. Physician-patient communication in the primary care office: a systematic review. *J Am Board Fam Pract*. 2002 Jan-Feb;15(1):25-38.
8. DiMatteo M. Health behaviors and care decisions: an overview of professional-patient communication. In: Gochman D, editor. *Handbook of health behavior research II: provider determinants*. New York: Plenum Press; 1997.
9. DiMatteo M. The role of the physician in the emerging health care environment. *West J Med*. 1998 May;168(5):328-33.
10. Berry L, Seiders K, Wilder SS. Innovations in access to care: a patient-centered approach. *Ann Intern Med*. 2003 Oct 7;139(7):568-74.
11. Anderson EB. Patient-centeredness: a new approach. *Nephrol News Issues*. 2002 Nov;16(12):80-2.
12. Little P, Everitt H, Williamson I, et al. Observational study of effect of patient centredness and positive approach on outcomes of general practice consultations. *BMJ*. 2001 Oct 20;323(7318):908-11.
13. Mead N, Bower P. Patient-centredness: a conceptual framework and review of the empirical literature. *Soc Sci Med*. 2000 Oct;51(7):1087-110.
14. Bechel D, Myers WA, Smith DG. Does patient-centered care pay off? *Jt Comm J Qual Improv*. 2000;26(7):400-9.

List of Core Report Measures

List of Core Report Measures

Measure	Measure number	Measure specifications	National database	State database
EFFECTIVENESS OF CARE				
CANCER				
Screening for breast cancer:				
Women age 40 and over who had a mammogram within the past 2 years	1.1	HP2010(3-13)	NHIS	BRFSS
Rate of breast cancers diagnosed at late stage	1.2	SEER program	SEER	NPCR
Cancer treatment:				
Cancer deaths per 100,000 female population per year for breast cancer	1.10	HP2010(3-3)	NVSS-M	NVSS-M
DIABETES				
Management of diabetes:				
Composite measure: Adults with diabetes who had hemoglobin A1c measurement, retinal eye exam, and foot exam in the past year	1.15	Specs for MEPS	MEPS	n.a.
Hospital admissions for lower extremity amputations in patients with diabetes per 1,000 population	1.27	HP 2010(5-10)	NHDS	HCUP SID
END STAGE RENAL DISEASE				
Management of end stage renal disease:				
Dialysis patients registered on the waiting list for transplantation	1.28	HP2010 4-5	USRDS	USRDS
Hemodialysis patients with urea reduction ratio 65% or higher	1.30	CMS	ESRD Clinical Performance Measures Project	U.Michigan
HEART DISEASE				
Counseling on risk factors:				
Current smokers age 18 and over receiving advice to quit smoking	1.36	HP2010(1-3c)	MEPS	BRFSS
Treatment of acute myocardial infarction (AMI):				
Composite measure: Hospital care for heart attack patients	1.37	QIO scope of work	QIO	n.a.

List of Core Report Measures

Measure	Measure number	Measure specifications	National database	State database
Treatment of acute heart failure:				
Composite measure: Hospital care for heart failure patients	1.46	QIO scope of work	QIO	n.a.
Heart disease treatment:				
Deaths per 1,000 adult admissions with acute myocardial infarction	1.55	AHRQ-QI	HCUP NIS	n.a.
HIV and AIDS				
AIDS prevention:				
New AIDS cases per 100,000 population 13 and over	1.57	HP2010(13-1)	CDC-AIDS	n.a.
Management of HIV/AIDS:				
HIV patients with CD4 <200 who receive PCP prophylaxis	1.59		HIV Research Network	n.a.
MATERNAL AND CHILD HEALTH				
Maternity care:				
Pregnant women receiving prenatal care in first trimester	1.61	HP2010(16-6a)	NVSS-N	NVSS-N
Infant mortality per 1,000 live births, by birth weight	1.63	HP2010(16-1c)	NVSS-I	NVSS-I
Immunization, childhood:				
Children 19-35 months who received all recommended vaccines	1.65	HP2010(14-24a)	NIS	NIS
Immunization, adolescent:				
Adolescents (13-15) who received 3 or more doses of hepatitis B vaccine	1.66	HP2010(14-27a)	NHIS	n.a.
Childhood dental care:				
Children 2-17 with a dental visit in last year	1.70	HP 2010(21-10)	MEPS	n.a.
Treatment of pediatric gastroenteritis:				
Hospital admissions for pediatric gastroenteritis per 100,000 population less than 18 years of age	1.71	AHRQ-QI	HCUP NIS	HCUP SID

List of Core Report Measures

Measure	Measure number	Measure specifications	National database	State database
Childhood preventive care				
Children 2-17 with advice about physical activity	1.73	Specs for MEPS	MEPS	n.a.
MENTAL HEALTH AND SUBSTANCE ABUSE				
Treatment of mental illness:				
Adults diagnosed with a new episode of depression and initiated on an antidepressant drug who remained on an antidepressant medication through the continuation phase of treatment	1.81	NCQA	HEDIS	n.a.
Suicide deaths per 100,000 population	1.82	HP2010(18-1)	NVSS-M	NVSS-M
Adults with serious psychological distress who receive mental health treatment or counseling	1.83	SAMHSA	SAMHSA	n.a.
Treatment of substance abuse:				
Persons age 12 and over who needed treatment for substance abuse who received such treatment	1.85	SAMHSA	SAMHSA	n.a.
Patients receiving substance abuse treatment who completed treatment	1.86	TEDS	TEDS	n.a.
RESPIRATORY DISEASES				
Immunization, pneumonia:				
Persons 65 and over who ever received pneumococcal vaccination	1.91	HP2010(14-29b)	NHIS	BRFSS
Treatment of pneumonia:				
Composite measure: Hospital care for pneumonia patients	1.92	QIO scope of work	QIO	n.a.
Treatment of upper respiratory infection (URI):				
Rate antibiotics prescribed at visits with a diagnosis of common cold per 10,000 population	1.99	HP2010(14-19)	NAMCS-NHAMCS	n.a.
Management of asthma:				
People with persistent asthma prescribed medications acceptable as primary therapy for long-term control of asthma (inhaled corticosteroids)	1.100	NCQA	HEDIS	n.a.

List of Core Report Measures

Measure	Measure number	Measure specifications	National database	State database
Hospital admissions for asthma per 100,000 population under 18	1.101	AHRQ-QI	HCUP NIS	HCUP SID
Treatment of TB:				
Tuberculosis patients who complete course of treatment within 12 months of treatment initiation	1.104	HP2010 (14-12)	CDC-TB	n.a.
NURSING HOME AND HOME HEALTH CARE				
Nursing facility care:				
Long-stay nursing home residents who were physically restrained	1.107	CMS	n.a.	MDS
High risk long-stay nursing home residents with pressure sores	1.112	CMS	n.a.	MDS
Low risk long-stay nursing home residents with pressure sores	1.113	CMS	n.a.	MDS
Short-stay nursing home residents who have pressure sores	1.118	CMS	n.a.	MDS
Home health care:				
Home health care patients who get better at walking or moving around	1.125	CMS	n.a.	OASIS
Home health care patients who had to be admitted to the hospital	1.131	CMS	n.a.	OASIS
PATIENT SAFETY				
Complications of care:				
Central line-associated bloodstream infection in intensive care unit (ICU) patients	2.6	HP2010(14-20b)	NNIS	n.a.
Intensive care unit patients—ventilator-associated pneumonia	2.24	CDC	NNIS	n.a.
Medicare beneficiaries with postoperative pulmonary embolus or deep vein thrombosis	2.26	CMS	MPSMS	n.a.
Medicare beneficiaries with central venous catheter-associated mechanical complication	2.28	CMS	MPSMS	n.a.
Prescribing medications:				
Elderly with inappropriate medications	2.38	AHRQ	MEPS	n.a.

List of Core Report Measures

Measure	Measure number	Measure specifications	National database	State database
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TIMELINESS**Getting appointments for care:**

Adults who always can get care for illness or injury as soon as wanted	3.5	Specs for MEPS	MEPS	NCBD
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Waiting time:

Emergency department visits in which the patient left without being seen	3.8	NCHS	NAMCS-NHAMCS	n.a.
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PATIENT CENTEREDNESS**Patient experience of care:**

Composite measure: Adults whose health providers always listened carefully, explained things, showed respect, and spent enough time with them	4.1	Specs for MEPS	MEPS	n.a.
Composite measure: Children whose health providers always listened carefully, explained things, showed respect, and spent enough time with them	4.2	Specs for MEPS	MEPS	n.a.

Key to abbreviations:

AHRQ-QI = Agency for Healthcare Research and Quality–Quality Indicators

BRFSS = Behavioral Risk Factor Surveillance System

CDC TB = Centers for Disease Control & Prevention National Tuberculosis Surveillance System

CDC AIDS = Centers for Disease Control and Prevention HIV/AIDS Surveillance System

CMS = Centers for Medicare & Medicaid Services

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

HEDIS = Health Plan Employer Data and Information Set

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

NHIS = National Health Interview Survey

NHDS = National Hospital Discharge Survey

NIS = National Immunization Survey

NNIS = National Nosocomial Infections Surveillance

NPCR = National Program of Cancer Registries

NVSS-I = National Vital Statistics System —Linked Birth and Infant Death Data

National Healthcare Quality Report
List of Core Report Measures

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
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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