

2010



# National Healthcare Quality Report



Agency for Healthcare Research and Quality

Advancing Excellence in Health Care • [www.ahrq.gov](http://www.ahrq.gov)



2010

# National Healthcare Quality Report

**U.S. Department of  
Health and Human Services**

Agency for Healthcare Research and Quality  
540 Gaither Road  
Rockville, MD 20850

AHRQ Publication No. 11-0004  
March 2011  
[www.ahrq.gov/qual/qdr10.htm](http://www.ahrq.gov/qual/qdr10.htm)

# Acknowledgments

The NHDR and NHQR are the products of collaboration among agencies across the Department of Health and Human Services (HHS). Many individuals guided and contributed to this report. Without their magnanimous support, this report would not have been possible.

Specifically, we thank:

**Primary AHRQ Staff:** Carolyn Clancy, William Munier, Katherine Crosson, Ernest Moy, Karen Ho, William Freeman, and Doreen Bonnett.

**HHS Interagency Workgroup for the NHQR/NHDR:** Girma Alemu (HRSA), Roxanne Andrews (AHRQ-CDOM), Hakan Aykan (HHS-ASPE), Rachel Ballard-Barbash (NIH-NCI), Douglas Boenning (HHS-ASPE), Doreen Bonnett (AHRQ-OCKT), Melinda Buntin (HHS-ONC), Cecelia Rivera Casale (AHRQ-OEREP), Francis Chesley (AHRQ-OEREP), Frances Chevarley (AHRQ-CFACT), Steven Clauser (NIH-NCI), Agnes Davidson (HHS-OPHS), Denise Dougherty (AHRQ-OEREP), Paul Eggers (NIH-NIDDK), Brenda Evelyn (FDA), William Freeman (AHRQ-CQuIPS), Edward Garcia (CMS), Miryam Gardine (HRSA), Olinda Gonzalez (SAMHSA), Tanya Grandison (HRSA), Darryl Gray (AHRQ-CQuIPS), Saadia Greenberg (AoA), Kirk Greenway (IHS), Lein Han (CMS), Linda Harlan (NIH-NCI), Karen Ho (AHRQ-CQuIPS), Edwin Huff (CMS), Deloris Hunter (NIH-NIMHD), Memuna Ifedirah (CMS), Padmini Jagadish (AHRQ-OEREP), Kenneth Johnson (HHS-OCR), Ruth Katz (HHS-ASPE), Richard Klein (CDC-NCHS), Lisa Koonin (CDC-NCHS), Shari Ling (CMS), Leopold Luberecki (HHS-ASL), Diane Makuc (CDC-NCHS), Marty McGeein (HHS-ASPE), Richard McNaney (CMS), Nancy Miller (NIH-OSP), Carmen Moten (NIH-NIMH), Ernest Moy (AHRQ-CQuIPS), Leo Nolan (IHS), Cynthia Ogden (CDC/NCHS), Susan Polniaszek (ASPE), Michael Rapp (CMS), Georgetta Robinson (CMS), William Rodriguez (FDA), Rochelle Rollins (HHS-OMH), Asel Ryskulova (CDC-NCHS), Judy Sangl (AHRQ-CQuIPS), Michael Schoenbaum (NIH-NIMH), Adelle Simmons (HHS-ASPE), Alan E. Simon (CDC-NCHS), Sunil Sinha (CMS), Jane Sisk (CDC-NCHS), Phillip Smith (IHS), Nancy Sonnenfeld (CDC-NCHS), Caroline Taplin (HHS-ASPE), Emmanuel Taylor (NIH-NCI), Wilma Tilson (HHS-ASPE), Benedict Truman (CDC), Joan Van Nostrand (HRSA), Barbara Wells (NIH-NHLBI), Valerie Welsh (HHS-OMH), Odies Williams (HHS-OCR), Lee Wilson (HHS-ASPE), and Susan Yanovski (NIH-NIDDK).

**AHRQ NHQR/NHDR Team:** Roxanne Andrews, Barbara Barton, Doreen Bonnett, Xiuhua Chen, Frances Chevarley, Cecilia Rivera Casale, Katherine Crosson, Denise Dougherty, William Freeman, Darryl Gray, Paul Gorrell, Karen Ho, Ernest Moy, Atlang Mompe, William Munier, Janet Pagán-Sutton, and Judy Sangl.

**HHS Data Experts:** Roxanne Andrews (AHRQ), Frances Chevarley (AHRQ), Steven Cohen (AHRQ), James Colliver (SAMHSA), Mark Eberhardt (CDC-NCHS), Paul Eggers (NIH), Alyson Essex (CDC-NCHS), John Fleishman (AHRQ), Elizabeth Goldstein (CMS), Erin Grace (AHRQ), Janey Hsiao (CDC-NCHS), Susan Jack (CDC-NCHS), Deepthi Kandi (CDC-NCHS), David Keer (ED-OSERS), Kenneth Kochanek (CDC-NCHS), Stan Lehman (CDC), Tracy Matthews (HRSA), Diane Meier (HHS-ASPE), William Mosher (CDC-NCHS), Ryan Mutter (AHRQ), Shaleah Patzer (CDC-NCHS), Arlene Siller (CDC-NCHS), Jack Vaughn (CDC-NCHS), Reda Wilson (CDC-NPCR), and Marc Zodet (AHRQ) and members of the Interagency Subcommittee on Disability Statistics.

**Other Data Experts:** Stephen Connor (NHPCO), Stephen Edge (Rosewell Park Cancer Institute), Michael Halpern (American Cancer Society), Bryan Palis (American College of Surgeons), Allison Petrilla (NHPCO), Carol Spence (NHPCO), Andrew Stewart (American College of Surgeons).

**Other AHRQ Contributors:** James Battles, Jeff Brady, Cindy Brach, Judi Consalvo, Chris Crofton, James Cleeman, Noel Eldridge, Karen Fleming-Michael, Christine Heidenrich, Biff LeVee, Morgan Liscinsky, Corey Mackison, Gerri Michael-Dyer, Karen Migdail, Laura Nawrocki, Mary Nix, Pamela Owens, Mamatha Pancholi, Larry Patton, Wendy Perry, Mary Rolston, Scott Rowe, Randie Siegel, Christine Williams, and Phyllis Zucker.

**Data Support Contractors:** CHD-Fu, Social and Scientific Systems, Thomson Reuters Healthcare, and Westat.

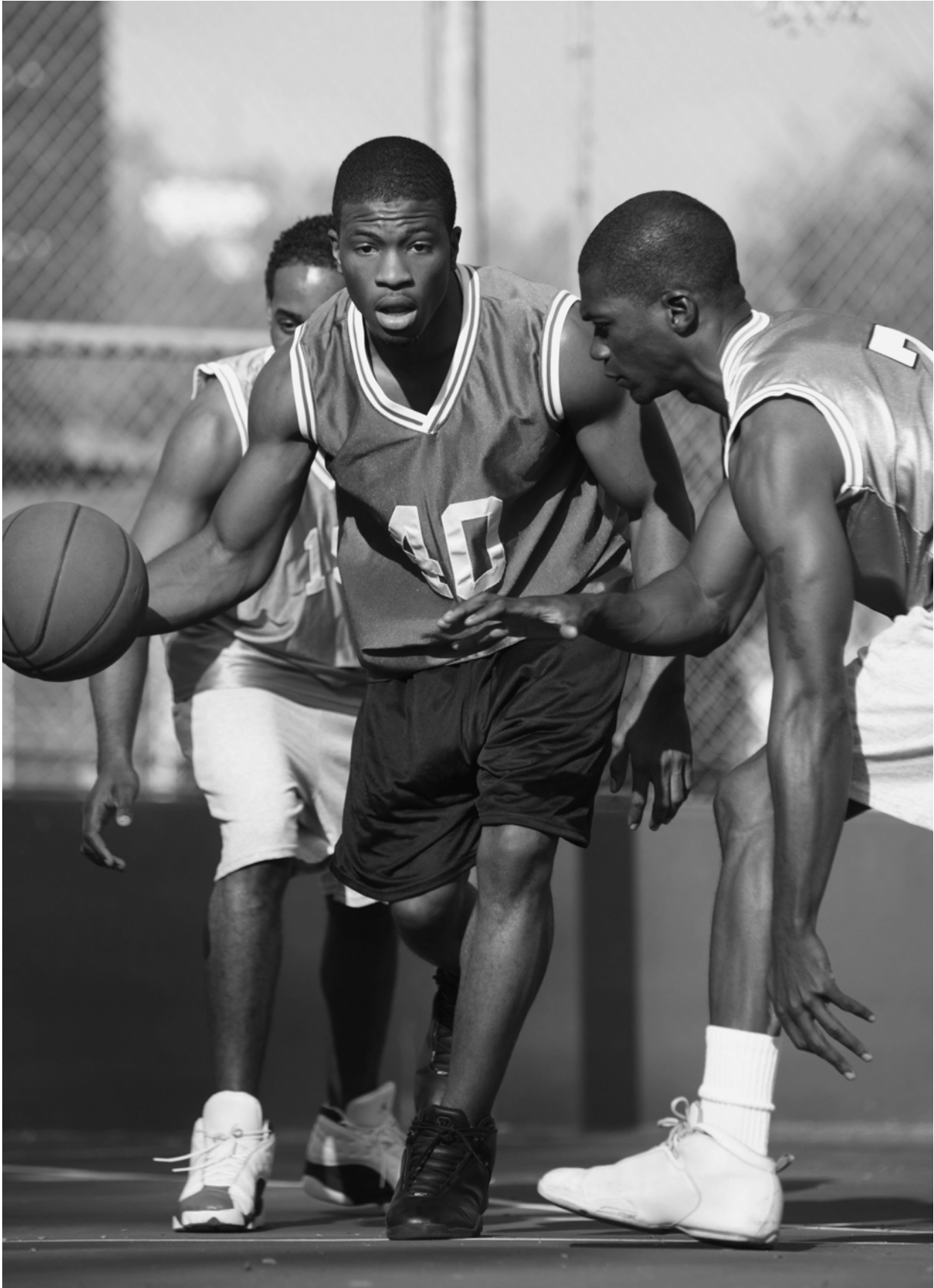
---

In memory of Ms. Beatrice Rouse, SAMHSA, a member of the Interagency Work Group, 2003-2010.

# Contents

<i>Chapter</i>	<i>Page</i>
<b>Highlights</b> .....	1
<b>1. Introduction and Methods</b> .....	31
<b>2. Effectiveness of Care</b> .....	53
Cancer .....	54
Diabetes .....	60
End Stage Renal Disease (ESRD) .....	67
Heart Disease .....	72
HIV and AIDS .....	77
Maternal and Child Health .....	82
Mental Health and Substance Abuse .....	91
Respiratory Diseases .....	98
Lifestyle Modification .....	105
Functional Status Preservation and Rehabilitation .....	115
Supportive and Palliative Care .....	120
<b>3. Patient Safety</b> .....	135
<b>4. Timeliness</b> .....	147
<b>5. Patient Centeredness</b> .....	153
<b>6. Care Coordination</b> .....	167
<b>7. Efficiency</b> .....	179
<b>8. Health System Infrastructure</b> .....	191
<b>9. Access to Health Care</b> .....	203
<b>Appendixes:</b>	
Data Sources .....	<a href="http://www.ahrq.gov/qual/qdr10/datasources/index.html">www.ahrq.gov/qual/qdr10/datasources/index.html</a>
Detailed Methods .....	<a href="http://www.ahrq.gov/qual/qdr10/methods/index.html">www.ahrq.gov/qual/qdr10/methods/index.html</a>
Measure Specifications .....	<a href="http://www.ahrq.gov/qual/qdr10/measurespec/index.html">www.ahrq.gov/qual/qdr10/measurespec/index.html</a>
Data Tables .....	<a href="http://www.ahrq.gov/qual/qdr10/index.html">www.ahrq.gov/qual/qdr10/index.html</a>





# Highlights From the National Healthcare Quality and Disparities Reports

Health care seeks to prevent, diagnose, and treat disease and to improve the physical and mental well-being of all Americans. Across the lifespan, health care helps people stay healthy, recover from illness, live with chronic disease or disability, and cope with death and dying. Quality health care delivers these services in ways that are safe, timely, patient centered, efficient, and equitable.

Unfortunately, Americans too often do not receive care that they need, or they receive care that causes harm. Care can be delivered too late or without full consideration of a patient's preferences and values. Many times, our system of health care distributes services inefficiently and unevenly across populations. Some Americans receive worse care than other Americans. These disparities may be due to differences in access to care, provider biases, poor provider-patient communication, and poor health literacy.

Each year since 2003, the Agency for Healthcare Research and Quality (AHRQ) has reported on progress and opportunities for improving health care quality and reducing health care disparities. Guided by a subcommittee of AHRQ's National Advisory Council and a Department of Health and Human Services (HHS) Interagency Work Group,<sup>i</sup> past reports were built on more than 250 measures categorized across six dimensions: effectiveness, patient safety, timeliness, patient centeredness, efficiency, and access to care. As mandated by the U.S. Congress, the National Healthcare Quality Report (NHQR) focuses on "national trends in the quality of health care provided to the American people" (42 U.S.C. 299b-2(b)(2)) while the National Healthcare Disparities Report (NHDR) focuses on "prevailing disparities in health care delivery as it relates to racial factors and socioeconomic factors in priority populations" (42 U.S.C. 299a-1(a)(6)).

The 2010 reports and this summary incorporate a number of recommendations made by the Institute of Medicine (IOM). The IOM first provided guidance to AHRQ on the NHQR and NHDR in 2002. In 2008, AHRQ again asked the IOM to offer suggestions for enhancing future reports and associated products to ensure that these reports raise awareness of the performance of the U.S. health care system. In April 2010, AHRQ received advice from the IOM Committee on Future Directions for the National Healthcare Quality and Disparities Reports.<sup>ii</sup>

In the past, separate Highlights were produced for each report. This year, we have integrated findings from the 2010 NHQR and 2010 NHDR to produce a single summary document. This is intended to reinforce the need to consider simultaneously the quality of health care and disparities across populations when assessing our health care system. The National Healthcare Reports Highlights seeks to address three questions critical to guiding Americans toward the optimal health care they need and deserve:

- What is the status of health care quality and disparities in the United States?
- How have health care quality and disparities changed over time?
- Where is the need to improve health care quality and reduce disparities greatest?

---

<sup>i</sup> The HHS Interagency Work Group represents 18 HHS agencies and offices.

<sup>ii</sup> The full report of this committee's recommendations can be found at [www.ahrq.gov/research/iomqrdreport](http://www.ahrq.gov/research/iomqrdreport).

# Highlights

Consistent with past reports, the 2010 reports emphasize one of AHRQ's priority populations as a theme. This year, we present expanded analyses of care across the urban-rural continuum, and the National Healthcare Reports Highlights includes a summary of care received by residents of different types of geographic areas. Finally, this document summarizes information on eight national priorities identified by the IOM Committee and presents novel strategies for improving quality and reducing disparities from AHRQ's Health Care Innovations Exchange (HCIE).

Four themes from the 2010 NHQR and 2010 NHDR emphasize the need to accelerate progress if the Nation is to achieve higher quality and more equitable health care in the near future.

- Health care quality and access are suboptimal, especially for minority and low-income groups.
- Quality is improving; access and disparities are not improving.
- Urgent attention is warranted to ensure improvements in quality and progress on reducing disparities with respect to certain services, geographic areas, and populations, including:
  - Cancer screening and management of diabetes.
  - States in the central part of the country.
  - Residents of inner-city and rural areas.
  - Disparities in preventive services and access to care.
- Progress is uneven with respect to eight national priorities:
  - Two are improving in quality: (1) Palliative and End-of-Life Care and (2) Patient and Family Engagement.
  - Three are lagging: (3) Population Health, (4) Safety, and (5) Access.
  - Three require more data to assess: (6) Care Coordination, (7) Overuse, and (8) Health System Infrastructure.
  - All eight priority areas showed disparities related to race, ethnicity, and socioeconomic status.

## Health Care Quality and Access Are Suboptimal, Especially for Minority and Low-Income Groups

A key function of the reports is to summarize the state of health care quality, access, and disparities for the Nation. This undertaking is difficult, as no single national health care database collects a comprehensive set of data elements that can produce national and State estimates for all population subgroups each year. Rather, data come from more than three dozen databases that provide estimates for different population subgroups and data years. While most data are gathered annually, some data are not collected regularly or are old. Despite the data limitations, our analyses indicate that health care quality in America is suboptimal. The gap between best possible care and that which is routinely delivered remains substantial across the Nation.

In the reports, measures are classified as either process measures or outcome measures. Process measures are further subdivided, when possible, into preventive care, acute treatment, and chronic disease management.

On average, people received the preventive services tracked in the reports two-thirds of the time. Moreover, wide variation was found in receipt of different types of preventive services. For instance, 20% of high-risk adults ages 18-64 ever received pneumococcal vaccination, but 94% of children ages 19-35 months received 3 doses of polio vaccine.

# Highlights

On average, people received appropriate acute care services three-quarters of the time. Rates of receipt of acute care services ranged from a low of 8% among patients who needed and received treatment for an alcohol problem at a specialty facility to a high of 94% of hospitalized patients who indicated that communication with their doctors was good.

On average, patients received recommended chronic disease management services three-quarters of the time. Again, receipt of chronic disease management services varied widely, from 17% of dialysis patients being registered on a kidney transplant waiting list to 95% of hospice patients receiving the right amount of pain medication.

Access to care is also far from optimal. On average, Americans report barriers to care one-fifth of the time, ranging from 3% of people saying they were unable to get or had to delay getting prescription medications to 60% of people saying their usual provider did not have office hours on weekends or nights.

All Americans should have equal access to high-quality care. Instead, we find that racial and ethnic minorities and poor people often receive poorer quality of care and face more barriers when trying to access care. To assess disparities, we focus on a set of “core” measures,<sup>iii</sup> which includes the most important and scientifically supported measures in the full reports measure set.

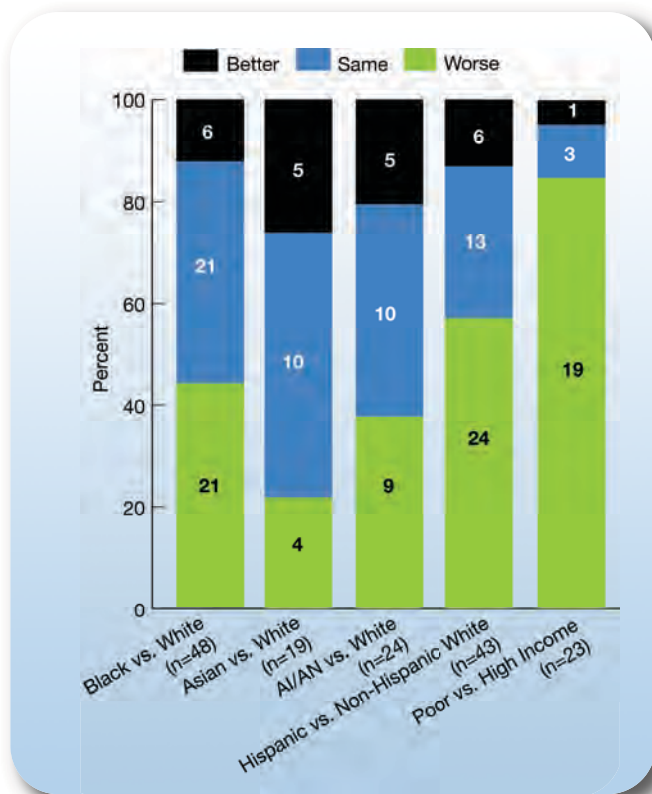
For each measure, we examine the relative difference between a selected group and its reference group. Differences that are statistically significant, are larger than 10%, and favor the reference group are labeled as indicating poor quality or access for the selected group. Differences that are statistically significant, are larger than 10%, and favor the selected group are labeled as indicating better quality or access for the selected group. Differences that are not statistically significant or are smaller than 10% are labeled as the same between the selected group and the reference group.



<sup>iii</sup> A list of core measures can be found in the Introduction and Methods chapter. Analyses of disparities presented in these Highlights focus on core measures and are so labeled. Other analyses use the entire measure set.

# Highlights

**Figure H.1. Distribution of core quality measures for which members of selected groups experienced better, same, or worse quality of care compared with reference group**



**Key:** AI/AN = American Indian or Alaska Native; n = number of measures.

**Better** = Population received better quality of care than reference group.

**Same** = Population and reference group received about the same quality of care.

**Worse** = Population received worse quality of care than reference group.

## ● Disparities in quality of care are common:

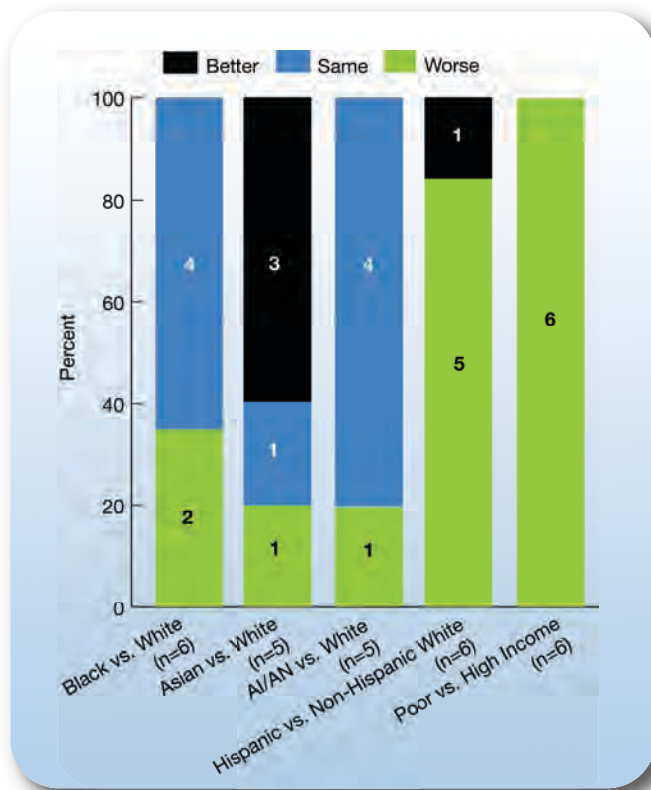
- Blacks and American Indians and Alaska Natives received worse care than Whites for about 40% of core measures.
- Asians received worse care than Whites for about 20% of core measures.
- Hispanics received worse care than non-Hispanic Whites for about 60% of core measures.
- Poor people received worse care than high-income people<sup>iv</sup> for about 80% of core measures.

<sup>iv</sup> Throughout these Highlights and reports, unless otherwise specified, poor indicates individuals whose household income is below the Federal poverty level and high income indicates individuals whose household income is at least four times the Federal poverty level.



# Highlights

**Figure H.2. Distribution of core access measures for which members of selected groups experienced better, same, or worse access to care compared with reference group**



**Key:** Al/AN = American Indian or Alaska Native; n = number of measures.  
**Better** = Population had better access to care than reference group.  
**Same** = Population and reference group had about the same access to care.  
**Worse** = Population had worse access to care than reference group.

- **Disparities in access are also common, especially among Hispanics and poor people:**
  - Blacks had worse access to care than Whites for one-third of core measures.
  - Asians and American Indians and Alaska Natives had worse access to care than Whites for 1 of 5 core measures.
  - Hispanics had worse access to care than non-Hispanic Whites for 5 of 6 core measures.
  - Poor people had worse access to care than high-income people for all 6 core measures.

## Quality Is Improving; Access and Disparities Are Not Improving

Suboptimal health care is undesirable, but we may be less concerned if we observe evidence of vigorous improvement. Hence, the second key function of the reports is to examine change over time. To track the progress of health care quality and access in this country, the reports present annual rates of change, which represent how quickly quality of and access to services delivered by the health care system are improving or

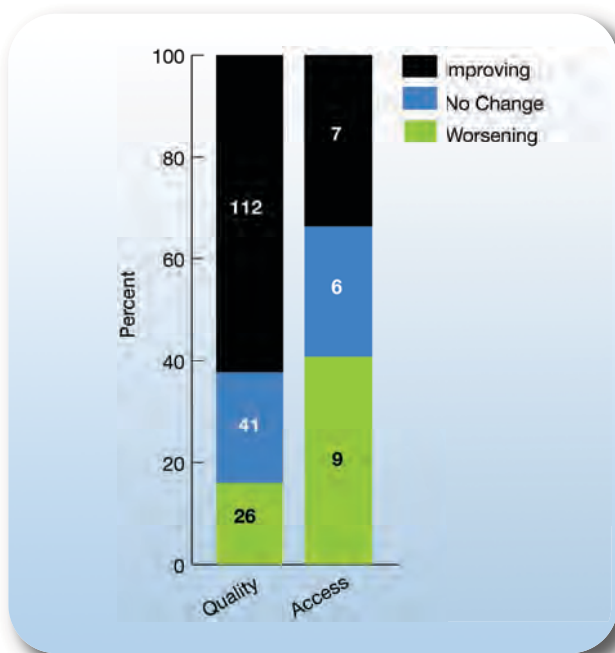
# Highlights

declining. Another way to describe rate of change is the speed of improvement or decline in health care quality and access.

As in past NHQRs, regression analysis is used to estimate annual rate of change for each measure. Annual rate of change is calculated only for measures with at least 3 years of data. For most measures, trends include data points from 2001-2002 to 2007-2008. We label measures going in a favorable direction at a rate exceeding 1% per year as improving, going in an unfavorable direction at a rate exceeding 1% per year as worsening, and changing at a rate less than 1% per year as not changing.

This year, for the first time, we introduce a similar method for assessing change in disparities using regression results. When a selected group's rate of change is at least 1% higher than the reference group's rate of change, we label the disparity as improving. When a selected group's rate of change is at least 1% lower than the reference group's rate of change, we label the disparity as worsening. When the difference in rates is less than 1%, we label the disparity as no change.

**Figure H.3. Change in quality and access over time**



**Improving** = Quality or access is going in a positive direction at an average annual rate greater than 1% per year.

**No Change** = Quality or access is not changing or is changing at an average annual rate less than 1% per year.

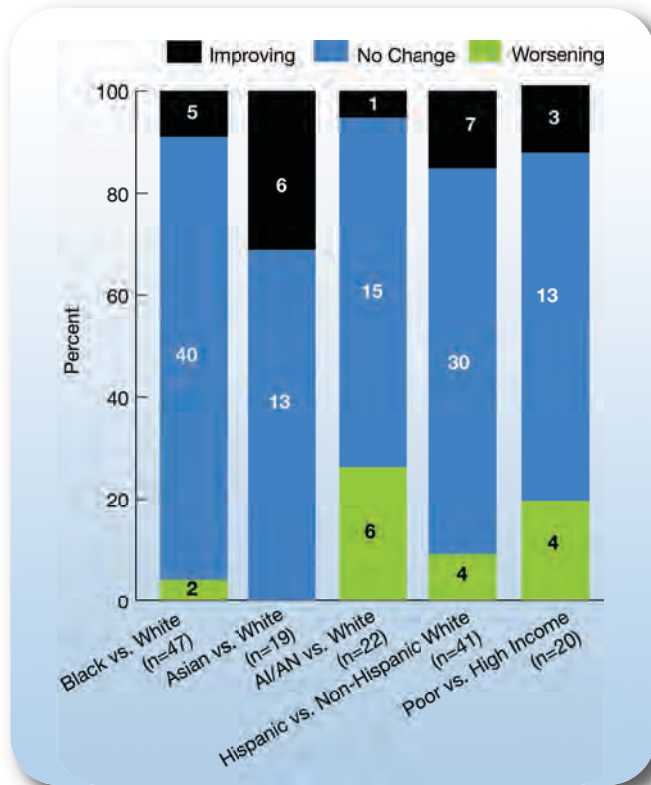
**Worsening** = Quality or access is going in a negative direction at an average annual rate greater than 1% per year.

- **Quality is improving slowly.** Across all 179 measures of health care quality tracked in the reports, almost two-thirds showed improvement. However, median rate of change was only 2.3% per year.
- **Access is not improving.** Across the 22 measures of health care access tracked in the reports, about 70% did not show improvement and 40% were headed in the wrong direction. Median rate of change was -0.6% per year, indicating no change over time.



# Highlights

**Figure H.4. Distribution of changes over time in racial, ethnic, and socioeconomic disparities for core quality measures**



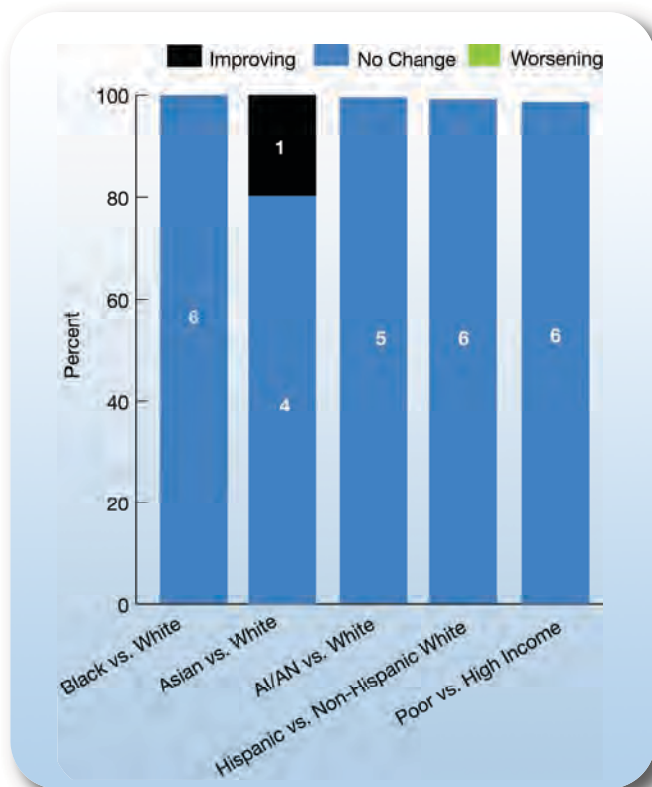
**Key:** AI/AN = American Indian or Alaska Native; n = number of measures.  
**Improving** = Disparity is getting smaller at a rate greater than 1% per year.  
**No Change** = Disparity is not changing or is changing at a rate less than 1% per year.  
**Worsening** = Disparity is getting larger at a rate greater than 1% per year.

- **Few disparities in quality of care are getting smaller.**

- Fewer than 20% of disparities faced by Blacks, American Indians and Alaska Natives, Hispanics, and poor people showed evidence of narrowing.
- The Asian-White gap was narrowing for about 30% of core measures, the largest proportion of any group, but most disparities were not changing.

# Highlights

Figure H.5. Distribution of changes over time in racial, ethnic, and socioeconomic disparities for core access measures



**Key:** AI/AN = American Indian or Alaska Native.

**Improving** = Disparity is getting smaller at a rate greater than 1% per year.

**No Change** = Disparity is not changing or is changing at a rate less than 1% per year.

**Worsening** = Disparity is getting larger at a rate greater than 1% per year.

- **Almost no disparities in access to care are getting smaller.**
  - Among disparities in core access measures, only one showed reduction.

## Urgent Attention Is Warranted To Ensure Improvements in Quality and Progress on Reducing Disparities

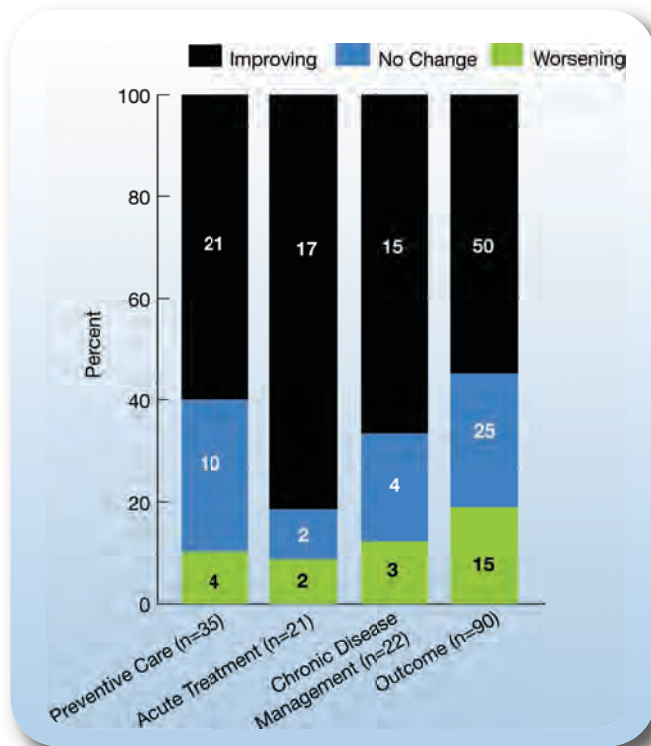
The third key function of the reports is to identify which areas are in greatest need of improvement. Potential problem areas can be defined in terms of types of services, parts of the country, and populations at risk.

### Variation Across Types of Services

Pace of improvement varies across preventive services, acute treatment, and chronic disease management.

# Highlights

Figure H.6. Change in quality over time by type of measure



**Key:** n = number of measures.

**Improving** = Quality is going in a positive direction at an average annual rate greater than 1% per year.

**No Change** = Quality is not changing or is changing at an average annual rate less than 1% per year.

**Worsening** = Quality is going in a negative direction at an average annual rate greater than 1% per year.

● **Measures of acute treatment are improving; measures of preventive care and chronic disease management are lagging.**

- While both process and outcome measures are improving, rates of improvement are faster among processes of care. Median rate of improvement of process measures was 2.6% per year compared with 1.6% per year for outcome measures.
- Among process measures, the highest rate of improvement was in measures related to treatment of acute illnesses or injuries. Of the 21 process of care measures related to acute treatment, about 80% showed improvement.
- In contrast, of the 35 process measures related to preventive services, only 60% showed improvement. Of the 22 process measures related to chronic disease management, about 70% showed improvement. This may reflect the high proportion of hospital measures included in acute treatment, many of which are tracked by the Centers for Medicare & Medicaid Services and publicly reported.

# Highlights

**Table H.1. Process measures getting worse over time**

Preventive Care	Acute Treatment	Chronic Disease Management
Women age 40+ who received a mammogram in the last 2 years Women age 18+ who received a Pap smear in the last 3 years Adults age 50+ who received a fecal occult blood test in the last 2 years Children ages 19-35 months who received 3 doses of <i>Haemophilus influenzae</i> type B vaccine	Emergency department (ED) visits lasting 6+ hours and resulting in admission to the hospital or transfer to another facility per 1,000 ED visits	Adults age 40+ with diabetes who received a hemoglobin A1c measurement in the calendar year Adults age 40+ with diabetes who received a dilated eye examination in the calendar year Adults age 40+ with diabetes who had their feet checked for sores in the calendar year

- **Several measures related to cancer screening and management of patients with diabetes have worsened over time.**

## Variation Across Parts of the Country

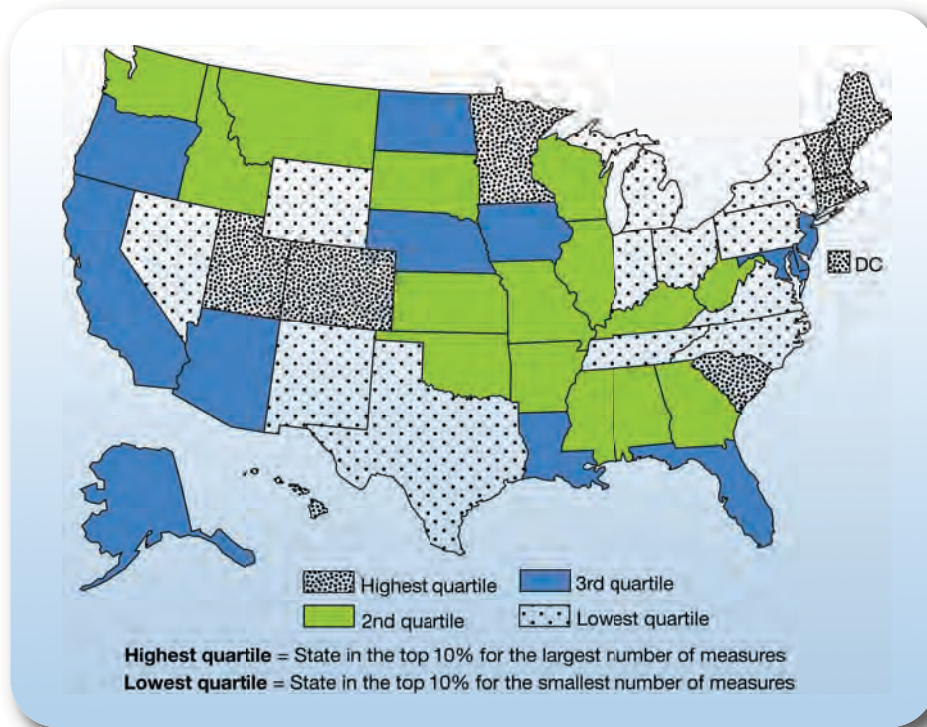
Quality of care varies not only across types of care but also across parts of the country. Knowing where to focus efforts improves the efficiency of interventions. Delivering data that can be used for local benchmarking and improvement is a key step in raising awareness and driving quality improvement. Since 2005, AHRQ has examined variation across States in the State Snapshots tool (<http://statesnapshots.ahrq.gov>). This Web site helps State health leaders, researchers, consumers, and others understand the status of health care quality in individual States and the District of Columbia. The State Snapshots are based on more than 100 NHQR measures, each of which evaluates a different aspect of health care performance and shows each State’s strengths and weaknesses.

The 2010 reports introduce a new method for examining variation across States and benchmarking quality of care. For measures with State data, we calculate the benchmark as the average for the top 10% of States; this average is referred to as the “achievable benchmark.” Achievable benchmarks are believed to be more actionable because they represent a level of performance that has been demonstrated in the real world. Here, we examine the frequency with which States perform in the top 10% of States and contribute to the achievable benchmark.

Data are not available for all States for all measures. Thus, States that have less health care data, either because it is not collected or because samples are too small to generate reliable estimates, have fewer opportunities to be in the top 10%. In addition, State data are more readily available from vital statistics and from hospitals, nursing homes, and home health agencies, while State data are much more limited for important topics such as quality of HIV or mental health care and care coordination. Policies that improve data collection at the State level would allow benchmarking across a broader array of measures. It is hoped that as health information technologies continue to expand, more information will become available for finer geographic units as well as for more granular subpopulations.

# Highlights

Figure H.7. Number of measures for which a State was in the top 10% by quartile



- **Two parts of the country led in performance.** While every State was in the top 10% for some measure and was part of a benchmark, States in the New England (CT, MA, ME, NH, RI, VT) and Pacific (AK, CA, HI, OR, WA) census divisions were benchmark States most often. States in the East North Central (IL, IN, MI, OH, WI), East South Central (AL, KY, MS, TN), and West South Central (AR, LA, OK, TX) divisions were benchmark States less often.

Table H.2. States most often contributing to the top 10%

Preventive Care	Acute Treatment	Chronic Disease Management	Outcome
Delaware	Maine	Hawaii	Arizona
Massachusetts	New Hampshire	Minnesota	District of Columbia
New Hampshire	New Jersey	New Hampshire	Hawaii
	Vermont	South Carolina	Utah

- New England did best on preventive care and acute treatment; western States did best on outcomes of care.

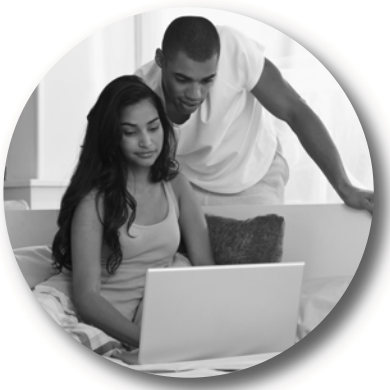
# Highlights

## Variation Across Populations at Risk

Previous reports have emphasized one of AHRQ's priority populations as a theme. This year, we present expanded analyses of care across the urban-rural continuum. AHRQ is charged with examining the care received by residents of inner-city and rural areas. People who live in these areas often face unique barriers to care related to provider availability and transportation. As in past reports, we have categorized areas into the following urban-rural categories:

- Large central metropolitan statistical area (MSA): Central counties (inner city) in metropolitan area of 1 million+ inhabitants.
- Large fringe MSA: Outlying counties (suburbs) in metropolitan area of 1 million+ inhabitants.
- Medium MSA: Counties in metropolitan area of 250,000 to 1,000,000 inhabitants.
- Small MSA: Counties in metropolitan area of 50,000 to 250,000 inhabitants.
- Micropolitan statistical area: Counties with an urban cluster of 10,000 to 50,000 inhabitants.
- Noncore statistical area: Counties outside of metropolitan or micropolitan areas.

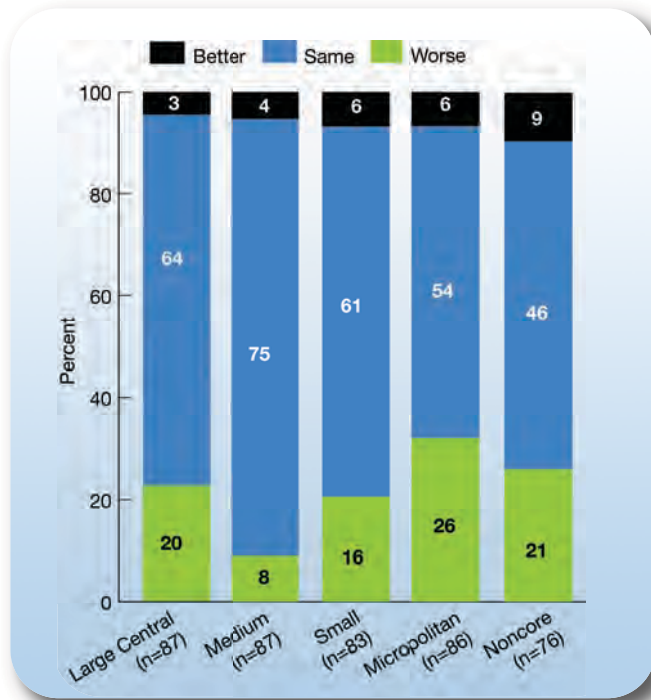
For comparisons across areas, residents of large fringe MSAs (large city suburbs) are used as the reference group since these counties have the lowest levels of poverty and typically have the best quality and access to health care.





# Highlights

**Figure H.8. Distribution of quality measures for which residents of specific areas experienced better, same, or worse quality of care compared with residents of large fringe metropolitan areas**



**Key:** n = number of measures.

**Better** = Population received better quality of care than reference group.

**Same** = Population and reference group received about the same quality of care.

**Worse** = Population received worse quality of care than reference group.

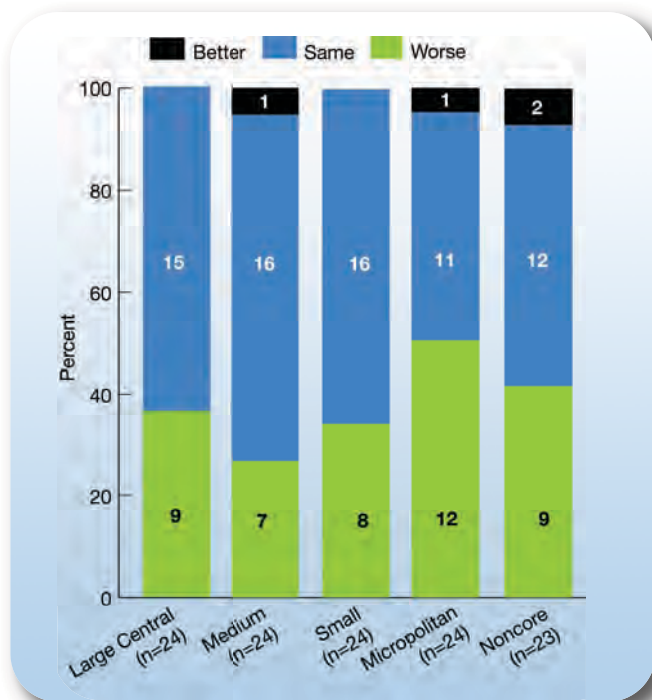
**Note:** Number of measures varies for each group because for some measures, data for some groups were not available.

- **Residents of inner-city and rural areas sometimes receive worse quality of care.** For most measures of quality of health care, differences across the urban-rural continuum were small. However, some disparities are noted. Compared with residents of large city suburbs, residents of large inner cities received worse care for about a quarter of quality measures tracked in the reports. Residents of micropolitan and noncore areas (areas typically regarded as “rural”) received worse care for about 30% of measures.
- Disparities related to preventive care were common across urban and rural areas while disparities related to diabetes were largest for residents of large inner cities and noncore rural areas.



# Highlights

**Figure H.9. Distribution of access measures for which residents of specific areas experienced better, same, or worse access to care compared with residents of large fringe metropolitan areas**



**Key:** n = number of measures.

**Better** = Population received better quality of care than reference group.

**Same** = Population and reference group received about the same quality of care.

**Worse** = Population received poorer quality of care than reference group.

**Note:** Number of measures varies for each group because for some measures, data for some groups were not available.

- Disparities in access to care across the urban-rural continuum tended to be more common than disparities in quality of care.** Compared with residents of large city suburbs, residents of large inner cities had worse access to care for about 35% of access measures tracked in the reports. Residents of micropolitan areas had worse access to care for 50% of access measures. Residents of noncore areas had worse access to care for about 40% of access measures.

The NHDR focuses on disparities related to race, ethnicity, and socioeconomic status. Table H.3 summarizes the largest disparities for each major group tracked in the reports that are either getting larger or staying the same. The table shows that many groups experience disparities related to preventive services and access to care.

# Highlights

**Table H.3. Largest racial, ethnic, and socioeconomic disparities in core quality and access measures that are not improving**

Groups	Measure	RR
Black compared with White	Hospital admissions for lower extremity amputations per 1,000 population age 18 and over with diabetes	2.0
	Emergency department visits where patients left without being seen	1.7
	Adults age 65 and over who ever received pneumococcal vaccination	1.5
Asian compared with White	Adults age 65 and over who ever received pneumococcal vaccination	1.4
	People with a usual primary care provider	1.3
	Adults who had a doctor's office or clinic visit in the last 12 months whose health providers listened carefully, explained things clearly, respected what they had to say, and spent enough time with them	1.2
American Indian/ Alaska Native compared with White	People under age 65 with health insurance	1.7
	Hospital patients with heart failure who received recommended hospital care	1.7
	Adults age 50 and over who ever received colorectal cancer screening	1.6
Hispanic compared with Non-Hispanic White	New AIDS cases per 100,000 population age 13 and over	3.3
	People under age 65 with health insurance	2.7
	People with a specific source of ongoing care	2.0
Poor compared with High Income	People under age 65 with health insurance	4.7
	Female Medicare beneficiaries age 65 and over who reported ever being screened for osteoporosis with a bone mass or bone density measurement	3.6
	People with a specific source of ongoing care	2.9

**Key:** RR indicates rate relative to reference group.

**Note:** To compare RRs, measures were framed negatively. Hence, an RR greater than 1 indicates that a group is receiving poorer quality of care or facing larger problems with access to care compared with the reference group. For example, an RR of 1.3 indicates that Asians are 1.3 times more likely than Whites not to have a usual primary care provider.

## Progress Is Uneven With Respect to Eight National Priority Areas

A key IOM recommendation was that AHRQ highlight progress in selected priority areas that are expected to yield the greatest gains in health care quality. These priorities include six areas identified by the National Priorities Partnership (NPP), a coalition representing 48 key health care organizations, as well as two areas proposed by the IOM. In this section, we report on progress in each of these priority areas. Findings are organized around key goals for each priority and include information from both the NHQR and NHDR.

In addition, the IOM encouraged the reports to go beyond problem identification and to include information that might help users address the quality and disparities concerns we identify. To that end, we present novel strategies for improving quality and reducing disparities, gathered from the AHRQ Health Care Innovations Exchange (HCIE). The HCIE is a repository of more than 1,500 quality improvement tools and more than 500 quality improvement stories. For each priority area, stories of successful innovations were searched.

# Highlights

Innovations that were most clearly described and yielded significant improvements in outcomes are displayed here.<sup>v</sup> By demonstrating that improvement can be achieved, we hope that these anecdotes inspire others to act.

Five of the eight priorities recommended by the IOM aligned with existing chapters of the 2009 NHQR and NHDR; new chapters were developed to address care coordination and health system infrastructure. Detailed findings related to these seven priorities can be found in the body of the reports. One priority area, population health, cuts across many sections of the reports. Hence, a more detailed summary of this priority is presented here in the Highlights. Table H.4 aligns the priorities with this year's reports.

**Table H.4. National Priorities Partnership priorities and location in NHQR and NHDR**

National Priority Area	NHQR/NHDR Chapter
Population Health	Highlights only
Palliative and End-of-Life Care	Palliative and Supportive Care section of Effectiveness chapter
Safety	Patient Safety
Patient and Family Engagement	Patient Centeredness
Care Coordination	New Care Coordination chapter
Overuse	Efficiency
Access	Access to Health Care
Health System Infrastructure	New Health System Infrastructure chapter

## National Priority: Population Health

Population health is influenced by many factors, including genetics, lifestyle, health care, and the physical and social environment. The reports focus on health care and counseling about lifestyle modification and do not address biological and social determinants of health that are currently not amenable to alteration through health care services. Nonetheless, it is important to acknowledge that the fundamental purpose of health care is to improve the health of populations. Acute care is needed to treat injuries and illnesses with short courses, and chronic disease management is needed to minimize the effects of persistent health conditions. But preventive services that avert the onset of disease, foster the adoption of healthy lifestyles, and help patients to avoid environmental health risks hold the greatest potential for maximizing population health.

The NPP envisioned “communities that foster health and wellness as well as national, state, and local systems of care fully invested in the prevention of disease, injury, and disability.” Key goals include promoting effective preventive services, adopting healthy lifestyle behaviors, and developing a national index of health.

---

<sup>v</sup> Identification numbers of items from the HCIE are included to help users find more information. To access detailed information about each novel strategy, insert the identification numbers at the end of this link and copy it into your browser window: <http://www.innovations.ahrq.gov/content.aspx?id=>

# Highlights

## Progress Toward Key Goals

Figure H.10 shows progress on measures related to population health:

- **Preventive services:** The NHQR and NHDR track 10 measures related to screening recommended by the U.S. Preventive Services Task Force, 11 measures related to adult immunizations, and 6 measures related to childhood immunizations.<sup>vi</sup>
  - Screening measures: Across the screening measures, most showed improvement. Median rate of improvement was 2.8% per year. In contrast, most disparities did not change, with the exception of mammography, in which the Asian-White gap was narrowing. In addition, the Black-White gap in rates of advanced stage breast cancer and the AI/AN-White, Hispanic-non-Hispanic White, and poor-high income gaps in colorectal cancer screening all widened.
  - Adult immunizations: Across the adult immunization measures, most showed improvement. Median improvement across measures was 11% per year. Receipt of adult immunizations varied dramatically by setting. Among outpatient measures, median rate of improvement was 0.8% per year, and most disparities did not change. Among inpatient measures, median rate of improvement was 22% per year, and most racial and ethnic disparities were getting smaller.
  - Childhood immunizations: Across the childhood immunization measures, most showed improvement. The childhood immunization measures all come from the Centers for Disease Control and Prevention's National Immunization Survey, so we can report them as a composite. The percentage of children who received the 4:3:1:3:3 vaccine series<sup>vii</sup> peaked in 2004 and has fallen since that time. There are few racial or ethnic disparities in childhood immunization, but income-related disparities persist.
- **Healthy lifestyles:** The NHQR and NHDR track five measures related to obesity, diet, and exercise; four measures related to nicotine and other substance addictions; and four measures related to transportation safety for children.<sup>viii</sup> Across these measures, most showed no improvement. Median rate of improvement was 0.9% per year. Most disparities did not change, but the Hispanic-non-Hispanic White and poor-high income gaps in counseling about smoking cessation narrowed.
- **National index of health:** The NHQR and NHDR track eight mortality measures.<sup>ix</sup> Across these measures, most showed improvement. Median rate of improvement was 1.3% per year. Most disparities did not change; the Black-White gap in prostate cancer mortality narrowed while education-related disparities in lung cancer mortality widened.

---

<sup>vi</sup> Screening: Mammogram, Pap test, colonoscopy/sigmoidoscopy; late-stage breast, cervical, and colorectal cancer screening; blood pressure, cholesterol, and osteoporosis screening; and vision check. Adult immunizations: Influenza and pneumococcal vaccine among elderly, high-risk, and diabetic patients; patients hospitalized for pneumonia; and long-stay and short-stay nursing home residents. Childhood immunizations: 4 doses of diphtheria-tetanus-acellular pertussis (DTaP), 3 doses of polio, 1 dose of measles-mumps-rubella (MMR), 3 doses of *Haemophilus influenzae* B (Hib), and 3 doses of hepatitis B vaccines, and 1 dose of varicella vaccine.

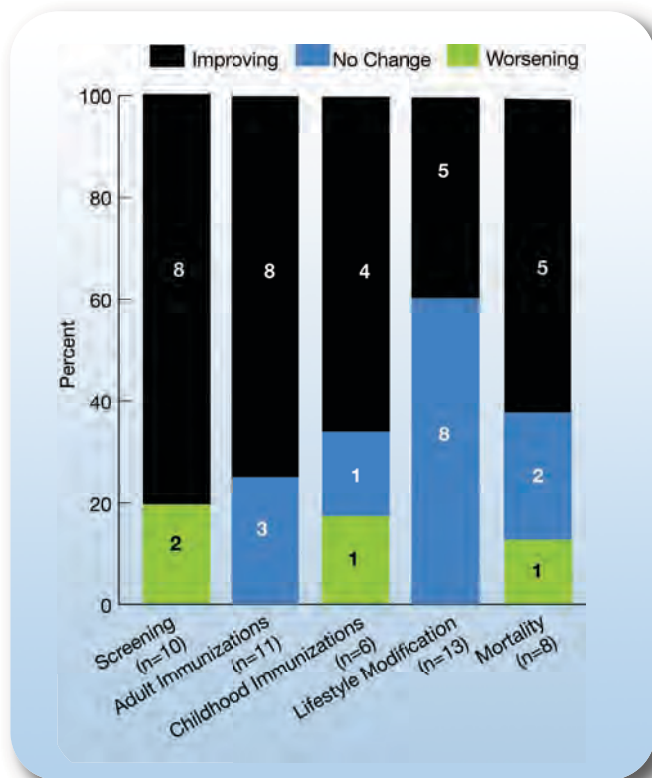
<sup>vii</sup> Number of children ages 19-35 months receiving first five childhood immunizations listed above.

<sup>viii</sup> Screening, diet counseling, exercise counseling for children and obese adults; smoking cessation and treatment for alcohol and other substance abuse; car seat, booster seat, seat belt, and bicycle helmet use.

<sup>ix</sup> Breast, colorectal, prostate, and lung cancer; HIV; suicide; and infant and maternal mortality.

# Highlights

Figure H.10. Change in measures of population health



**Key:** n = number of measures.

**Improving** = Quality is going in a positive direction at an average annual rate greater than 1% per year.

**No Change** = Quality is not changing or is changing at an average annual rate less than 1% per year.

**Worsening** = Quality is going in a negative direction at an average annual rate greater than 1% per year.

## Successful Strategies From AHRQ Health Care Innovations Exchange

### El Rio Health Center, AZ (2252)

- **Intervention:** Ongoing immunization training for pediatricians and nurses; nurse-run immunization clinics offered at the center and in the community; computerized data system tracking immunizations and reminders for both patients and providers.
- **Impact:** Program tripled childhood immunization rates, exceeding Federal standards.

### Wayne Action Teams for Community Health (WATCH), NC (2929)

- **Intervention:** Created new processes to identify and provide individuals in need of colorectal cancer screening and smoking cessation education by forming partnerships with community-based organizations and providers. Patients participated in ongoing performance monitoring and evaluation.
- **Impact:** Over 1 year, colorectal cancer screening rose from 16% to 98%. Smokers receiving cessation education increased from 66% to 98%.

# Highlights

## **Bienestar Health Program, TX (2085)**

- **Intervention:** Culturally competent school-based behavior modification program intended to prevent or delay the onset of type 2 diabetes among Mexican-American and other at-risk youth. The five key components of the program are: health education, physical education, family education, student health club, and lessons for the school cafeteria.
- **Impact:** Program increased physical fitness and dietary fiber intake and reduced blood sugar levels, changes that reduce the risk of type 2 diabetes.

## **National Priority: Palliative and End-of-Life Care**

Disease cannot always be cured, and disability cannot always be reversed. For patients with long-term health conditions, relieving symptoms, enhancing quality of life, and preventing complications are important goals. Providing emotional and spiritual support to patients and their families during serious and advanced illness and honoring patient values and preferences for care are critical.

The NPP vision for this priority is health care “capable of promising dignity, comfort, companionship, and spiritual support to patients and families facing advanced illness or dying.” Key goals include relief of suffering, help with emotional and spiritual needs, effective communication about options for treatment and dying, and high-quality hospice services.

### **Progress Toward Key Goals**

- **Relief of suffering:** Among patients receiving home health care and nursing home care, management of symptoms, such as shortness of breath or pressure sores, is improving. However, most quality of care measures are far below achievable benchmarks, and considerable disparities persist related to age, gender, race, and ethnicity.
- **Help with emotional support:** Among hospice patients, fewer than 10% do not receive the right amount of help for feelings of anxiety or sadness. However, considerable disparities related to age, race, and ethnicity are observed.
- **Communication about dying:** Among family caregivers of hospice patients, about one in six wanted more information about what to expect while the patient was dying. In addition, considerable disparities related to age, gender, race, and ethnicity are observed.
- **Palliative care and hospice services:** Among hospice patients, few received care inconsistent with their stated end-of-life wishes. However, considerable disparities related to age, race, ethnicity, and education are observed. Availability of nonhospice palliative care providers also is a problem; roughly half of U.S. hospitals have yet to develop palliative care programs.



# Highlights

## Successful Strategies From AHRQ Health Care Innovations Exchange

### North Florida/South Georgia Veterans Health System Advanced Illness Palliative Care Program, FL (1850)

- **Intervention:** Multidisciplinary initiative that provides care management and palliative care to chronically or terminally ill veterans in their homes via telehealth technology.
- **Impact:** In a 2-year period, 98% of participants reported adherence to their medications; 92% felt more connected to their providers; overall health care expenditures for program participants decreased by 67%.

### Dana-Farber Cancer Institute Pediatric Advanced Care Team (PACT), MA (2195)

- **Intervention:** Pediatric palliative care consultation service that addresses the physical, psychosocial, and spiritual needs of children with life-threatening illnesses and their families. PACT services focus on providing intensive symptom management, as well as honest, complete, and sensitive communication with patients and families.
- **Impact:** Improved communication and documentation related to care goals helped ease patient suffering at the end of life and helped parents feel more prepared for their child's end-of-life experience.

## National Priority: Patient Safety

An inherent level of risk is involved in performing procedures and services to improve the health of patients. Although degree of risk is often related to the severity of illness, variations in adverse event rates occur between different facilities and between caregivers. Avoidable medical errors account for an immense number of deaths annually. Even if patients do not die from a medical error, they will often have longer and more expensive hospital stays. Clearly, some risk can be reduced and some cannot, but research has shown that large numbers of errors and adverse events can be markedly reduced if addressed with appropriate interventions and efforts.

The NPP's vision is "a healthcare system that is relentless in continually reducing the risks of care, aiming for 'zero' harm wherever possible—a system that can promise absolute care, guaranteeing that every patient, every time, receives the benefits of care based solidly on science." The vision sees health care leaders and professionals as leading this effort and being resolute in eliminating defects and errors in care, regardless of their current safety performance levels. Key goals are reducing healthcare-associated infections (HAIs) and serious adverse events (SAEs), reducing preventable and premature hospital-level mortality rates, and improving 30-day mortality rates following hospitalization for selected conditions (acute myocardial infarction, heart failure, pneumonia).

## Progress Toward Key Goals

Figure H.11 shows progress in measures related to patient safety:

- **Reducing HAIs and SAEs:** The reports track 36 safety measures related to HAIs and other SAEs that can occur during hospitalization. Of these measures, most showed improvement. Across all measures, median improvement was 3.6% per year. By comparison, among 14 hospital quality measures not

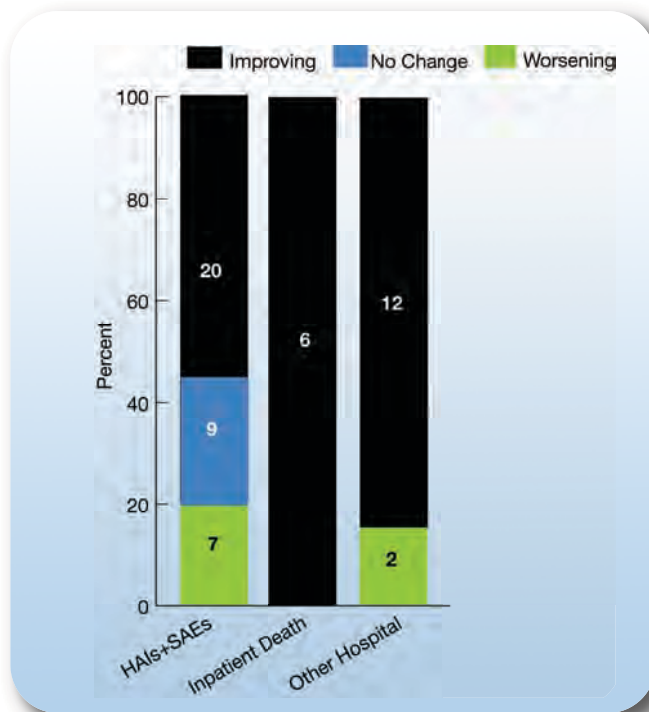


# Highlights

related to safety, median improvement was 21% per year. While progress in safety is clearly being made, it lags behind improvement in other hospital quality measures. In both process and outcome measures, disparities have been observed mainly across geographic locations and among racial and ethnic groups and are especially prominent among Hispanics. Although progress has been made, with some gaps closing, disparities continue over time. In addition, we are unable to examine many adverse events outside of hospital settings due to insufficient data and measures.

- **Reducing preventable and premature hospital-level mortality rates:** To track preventable and premature hospital-level mortality rates, the NHQR and NHDR monitor failure to rescue (deaths per 1,000 discharges having developed specified complications of care during hospitalization). Although an overall trend cannot be drawn from this single measure, it is noteworthy to mention that this rate has been decreasing for a number of years. Disparities have been observed for failure to rescue, mainly among racial and ethnic populations and less so across income groups. Over time, these disparities have not changed significantly.
- **Improving mortality rates for selected conditions:** Data do not support tracking 30-day mortality rates for all payers across the Nation. Instead, the NHQR and NHDR track inpatient mortality, which correlates well with 30-day mortality rates. Across six inpatient mortality measures, all showed improvement. Significant disparities were observed across racial and ethnic populations, with gaps not changing over time.

Figure H.11. Change in measures of safety versus other hospital measures



**Key:** HAI = healthcare-associated infection; SAE = serious adverse event.

**Improving** = Quality is going in a positive direction at an average annual rate greater than 1% per year.

**No Change** = Quality is not changing or is changing at an average annual rate less than 1% per year.

**Worsening** = Quality is going in a negative direction at an average annual rate greater than 1% per year.

# Highlights

## Successful Strategies From AHRQ Health Care Innovations Exchange

### St. John Hospital and Medical Center, MI (2333)

- **Intervention:** Standardized, nurse-enforced protocols were developed to prevent catheter-related bloodstream infections, including tools to assist in following these protocols and an education program for physicians and nurses.
- **Impact:** Catheter-related bloodstream infections were reduced from 9.6 to 3 per 1,000 central line days, delaying the onset of infections in those who develop them; the reduction in such infections has led to substantial cost savings.

### Barnes-Jewish Hospital, St. Louis, MO (2262)

- **Intervention:** Initiative integrates technology with a procedural checklist during the preoperative process to prevent wrong-site surgery. Checklist enables clinicians to confirm that the patient's history and physical examination reports are in the chart, circulating nurse visits the patient before surgery, and surgical site is inkmarked. An electronic patient wristband with an embedded sensor is deactivated when the correct surgical site is definitively marked.
- **Impact:** Program has eliminated wrong-site surgeries and near-misses at Barnes-Jewish Hospital's ambulatory center and the short-stay operating room suite has full compliance with required preoperative processes.

## National Priority: Patient and Family Engagement

In order for patients to effectively navigate the complicated health care system, providers need to ensure that patients can access culturally and linguistically appropriate tools. Strategies to support patient and family engagement enable patients to understand all treatment options and to make decisions consistent with their values and preferences.

The vision of the NPP is health care “that honors each individual patient and family, offering voice, control, choice, skills in self-care, and total transparency, and that can and does adapt readily to individual and family circumstances, and to differing cultures, languages, and social backgrounds.” Key goals include enabling patients to effectively navigate and manage their care and enabling patients to make informed decisions about their treatment options.

## Progress Toward Key Goals

- **Effectively navigating and managing care:** More than 90% of U.S. adults were able to easily read their prescription instructions. However, disparities were observed among groups varying by insurance status, English proficiency, education, and income. Ethnicity, income, and education also were associated with the need for language assistance when navigating the health care system.
- **Making informed decisions about treatment options:** Most adults felt it was easy to understand written instructions from a doctor's office but nearly one-fifth of adults were sometimes or never asked to help with decisions on treatment. Disparities were observed related to insurance status, English proficiency, education, and race/ethnicity.

# Highlights

## Successful Strategies From AHRQ Health Care Innovations Exchange

### UC San Francisco Breast Care Center Decision Services Unit, CA (95)

- **Intervention:** Initiative offers a consultation planning, recording, and summarizing service in which trained interns help patients brainstorm and write down a list of questions and concerns for their providers.
- **Impact:** Program improved patient decisionmaking and communication between provider and patient. The preappointment planning session and the assistance during the appointment resulted in a 19% reduction in decisional conflict.

### Health Literacy Collaborative of the Iowa Health System, IA (1855)

- **Intervention:** Educates staff on the importance of communicating health information clearly to patients and families regardless of reading ability, creates easy-to-understand materials based on patients' needs and preferences, and trains health care workers to use these materials with their patients.
- **Impact:** Patients have access to more understandable health information and report high levels of satisfaction with provider-patient communication.

### University of Massachusetts Memorial Medical Center's Language Services Department, MA (2657)

- **Intervention:** Developed a comprehensive process to ensure that patients with limited English proficiency and patients who are deaf or hard of hearing have timely access to interpreter services.
- **Impact:** Program reduced patient waiting time for an interpreter; 86% of patients waited 15 minutes or less. The number of languages in which interpreter services are available increased from 51 in 2007 to 75 in 2009.

## National Priority: Care Coordination

Care coordination is a conscious effort to ensure that all key information needed to make clinical decisions is available to patients and providers. Health care in the United States was not designed to be coordinated. Patients commonly receive medical services, treatments, and advice from multiple providers in many different care settings, each scrutinizing a particular body part or system. Attending to the patient as a whole is rare. Less than sufficient provider-provider and provider-patient communication is common and may lead to delays in treatment and inaccuracies in medical information. Enhancing teamwork and increasing use of health information technologies to facilitate communication among providers and patients can improve care coordination.

The NPP envisioned health care that “guides patients and families through their healthcare experience, while respecting patient choice, offering physical and psychological supports, and encouraging strong relationships between patients and the healthcare professionals accountable for their care.” Key goals include coordinating transitions of care, communicating medication information, and reducing hospital readmissions and preventable emergency department visits.

# Highlights

## Progress Toward Key Goals

- **Transitions of care:** Among patients hospitalized for heart failure, the quality of patient discharge instructions is improving. However, race-related disparities are observed.
- **Hospital readmissions:** While not all rehospitalizations can be prevented, better coordination at the point of discharge can prevent some readmissions. About 20% of patients hospitalized for heart failure are rehospitalized for a condition related to heart failure within 30 days. Considerable variation across States and by race is also observed.
- **Medication information:** Most providers ask patients about medications prescribed by other providers, and rates are improving. However, age- and education-related disparities are observed. Moreover, few hospitals currently support the electronic exchange of medication information with ambulatory care providers outside of their own system.
- **Preventable emergency department visits:** In patients with asthma, emergency department visits are five times as likely as hospitalizations, and some of these emergency department visits could be prevented with better coordination of outpatient care. Residents of inner cities and low-income neighborhoods have particularly high rates of emergency department visits.

## Successful Strategies From AHRQ Health Care Innovations Exchange

### University of Colorado at Denver Care Transitions Interventions, CO (1833)

- **Intervention:** A transition coach works directly with patients and family members for 30 days after discharge to help them understand and manage their complex postdischarge needs and ensure continuity of care across settings.
- **Impact:** The program reduced hospital readmissions and costs.

### Aurora Health Care, WI (1766)

- **Intervention:** A communitywide medication collaborative, involving health care consumers, providers, pharmacists, and community stakeholders, to give elderly patients and their providers the tools and education needed to assemble and verify accurate medication lists, and communicate effectively to prevent medication errors.
- **Impact:** The rate of accurate medication lists among patients improved from 55 to 72%.

## National Priority: Overuse of Services

Some diagnostic tests, procedures, and other services are performed even when they are unlikely to benefit the patient. These instances represent overuse of health services. Apart from causing discomfort and distress for patients, overuse can be harmful to the patient's health and increase costs.

The NPP's vision is "healthcare that promotes better health and affordable care by continually and safely reducing the burden of unscientific, inappropriate, and excessive care, including tests, drugs, procedures,

# Highlights

visits, and hospital stays.” The key goal is that all health care organizations will continually strive to improve the delivery of appropriate patient care and substantially and measurably reduce extraneous services and treatment.

## Progress Toward Key Goals

- **Inappropriate medication use:** Inappropriate medication use among older adults has been stable over time. No significant disparities among groups persisted over the observed study period for inappropriate medications for older adults.
- **Preventable emergency department visits and hospitalizations:** Preventable emergency department visits and hospitalizations have decreased gradually over the past decade. However, hospitalizations within 30 days of admission to nursing homes have not markedly changed. Significant disparities are observed for potentially avoidable hospitalization rates among different racial, ethnic, and income groups.
- **Potentially harmful preventive services with no benefit:** A preventive service without benefit tracked in the NHQR and NHDR is prostate-specific antigen (PSA) testing of men age 75 and over to screen for prostate cancer. During the time measured, there has been a slight increase in testing. Disparities among racial, ethnic, and income groups are observed although typically the reference groups experienced higher rates of PSA testing.

## Successful Strategies From AHRQ Health Care Innovations Exchange

### MaineHealth AH! (Asthma Health) Program, ME (2476)

- **Intervention:** Initiative uses hospital-based educators to support providers and other caregivers in providing quality asthma care. Asthma educators meet one on one with patients and their families to promote better asthma self-management.
- **Impact:** Asthma-related hospitalizations declined from 23.8% to 0% after the education sessions, and the percentage of children and parents who missed school or work declined from 49.4 to 7.8%.

### Summa Health System Care Coordination Network, OH (2162)

- **Intervention:** Ensures smooth transitions between the hospitals and 37 local skilled nursing facilities. The network uses a simplified transfer form, an electronic referral system, regular meetings, and other communication tools to boost patients’ discharge to a facility that meets their medical needs. The network also works to ensure smooth transitions when patients need to return to a hospital for surgery or testing.
- **Impact:** Program has led to fewer patients being readmitted to hospitals, lower hospital length of stay for patients transferred to skilled nursing facilities (which increased the bed capacity to an additional 130 inpatient admissions each year), and fewer cancellations of tests and surgeries for patients transferred from skilled nursing facilities.

# Highlights

## National Priority: Access

Access to care is defined as “the timely use of personal health services to achieve the best health outcomes.” The NPP’s vision for the access priority is a health care system that is “accessible and affordable for all segments of the U.S. population.” Access to health care has a significant effect on health disparities. There is substantial evidence that access to the health care system varies by socioeconomic factors and geographic location. Individuals with limited or no access to care (uninsured and underinsured people and those without a usual source of care) experience poor health outcomes, as well as worse quality of care. The NHQR and NHDR examine disparities in care related to insurance status, usual source of care, and financial barriers to care.

## Progress Toward Key Goals

- **Health insurance:** Adults ages 18-44 were least likely to have health insurance compared with other age groups. Hispanics were least likely to have health insurance compared with other racial and ethnic groups. While the percentage of people with health insurance increased for poor people, the percentage worsened for middle-income people. The percentage of poor people and near-poor people who were uninsured all year was about four times as high as that for high-income people.
- **Usual source of care:** Slightly more than one-half of uninsured people had a specific source of ongoing care. Blacks and Hispanics were much less likely than Whites and non-Hispanic Whites to have a specific source of ongoing care. About one in five uninsured children did not have a usual source of care. Minority children were also less likely than White children to have a usual source of care.
- **Financial burden:** Individuals with private nongroup insurance were nearly three times as likely as individuals with private employer-sponsored insurance to have high health insurance premiums and out-of-pocket medical expenses. Poor individuals were five times as likely as high-income individuals to have high health care expenses. Overall in 2007, 1 in 10 individuals reported that they were unable to receive or were delayed in receiving needed medical care, dental care, or prescription medicines due to financial or insurance reasons. Poor people were twice as likely as high-income people to report that they had this problem.

## Successful Strategies From AHRQ Health Care Innovations Exchange

### CarePartners, ME (1689)

- **Intervention:** Program matches uninsured Maine residents with local primary care physicians, specialists, and hospitals that are willing to provide free care and helps patients access free or low-cost drugs through prescription assistance programs.
- **Impact:** Program has helped to reduce emergency department visits, hospitalizations, and costs among participants to levels that are well below the average for Medicaid patients.

### MinuteClinic, MN (1772)

- **Intervention:** Walk-in primary care clinics are located within retail stores. Staffed by nurse practitioners and physician assistants, clinics use electronic health records and decision-support tools to provide low-



# Highlights

cost, evidence-based primary care services, including diagnosis and treatment of common illnesses and routine vaccinations.

- **Impact:** Patients are highly satisfied with the quality and convenience of services. Various studies suggest that clinic services cost less than similar services provided in other settings and conform with evidence-based guidelines.

## National Priority: Health System Infrastructure

Health system infrastructure is a priority area that requires national attention. The development of organizational capacity, adoption of health information technology (IT), and provision of a sufficient, culturally competent workforce are important areas of infrastructure that are central to improving health care quality and reducing disparities. The vision for this priority is to improve the foundation of health care systems, including infrastructure for data and quality improvement, culturally diverse workforce capacity and distribution, and systems to coordinate care.

### Progress Toward Key Goals

- **Organizational capacity:** In surveys of patient safety culture, Teamwork Within Units and Supervisor Expectations and Actions Promoting Patient Safety were the two areas that consistently received the most positive response regardless of the hospital's teaching status, ownership, geographic region, or bed size. Handoffs and Transitions and Nonpunitive Response to Error were the two areas that had the lowest percentage of positive response. This observation was consistent across hospitals, even after controlling for teaching status, ownership, size, and geographic region.
- **Health IT:** Currently, less than half of office-based providers have fully implemented e-prescribing. Physicians practicing in urban areas, the western United States, and larger groups had the highest adoption rates, as did younger physicians. Among hospitals, size, location, ownership, and teaching status were shown to be determinants of the adoption of e-prescribing. Larger hospitals, hospitals in urban areas, government-owned hospitals, and hospitals that were members of the Council of Teaching Hospitals (COTH) had higher rates of adoption.
- **Workforce:** Previous reports have examined the physician and nursing workforce; this year, the focus is on pharmacists. The pharmacy workforce is distributed in proportion to population across all four regions of the United States. In contrast, relative to population, Hispanics and non-Hispanic Blacks are underrepresented in the pharmacy workforce while non-Hispanic Whites and Asians are overrepresented.

### Successful Strategies From AHRQ Health Care Innovations Exchange

#### HealthSpring, TN (2080)

- **Intervention:** Program offers financial bonuses to selected medical practices, onsite practice coordinators, and dedicated disease management support. Bonuses equal to 20% of health plan payments are awarded if physicians meet clinical care improvement goals.



# Highlights

- **Impact:** In eight practices, the program led to significant improvements in a broad range of clinical quality indicators, along with decreases in members’ emergency department visits, hospitalizations, and total medical expenses.

## Arizona Medical Information Exchange, AZ (2599)

- **Intervention:** Enables clinicians to immediately access hospital discharge, laboratory test, and medication data on specific patients from other providers, allowing them to make more fully informed clinical decisions, avoid test duplication, ensure safe medication prescribing, and provide continuity of care.
- **Impact:** Users report that it has led to greater efficiency, increased safety, and a reduction in costs associated with unnecessary procedures and laboratory tests.

Table H5 summarizes progress on the national priorities, categorizing each as making progress, progress lagging, or lacking sufficient data to assess.

**Table H.5. Summary of progress on national priorities**

Making Progress	Progress Lagging	Need More Data
Palliative and End-of-Life Care Patient and Family Engagement	Population Health Safety Access	Care Coordination Overuse Health System Infrastructure

- **Palliative and End-of-Life Care:** Quality generally high; more problems with access to palliative care.
- **Patient and Family Engagement:** Quality generally high; most measures improving.
- **Population Health:** Most measures improving slowly; healthy lifestyles not improving.
- **Safety:** Most measures improving but more slowly than other hospital measures.
- **Access:** Not improving.
- **Care Coordination, Overuse, Health System Infrastructure:** Measures and data are limited; more information is needed to assess performance.
- **Disparities:** Present in all national priorities with little evidence of improvement.

## Conclusion

Improving quality and reducing disparities require measurement and reporting, but these are not the ultimate goals. The fundamental purpose of improvement in health care is to make all patients’ and families’ lives better. The NHQR and NHDR concentrate on tracking health care quality and disparities at the national level, but the statistics reported in the reports reflect the aggregated everyday experiences of patients and their providers across the Nation.

# Highlights

It makes a difference in people's lives when breast cancer is diagnosed early; when a patient suffering from a heart attack is given the correct lifesaving treatment in a timely fashion; when medications are correctly administered; and when doctors listen to their patients and their families, show them respect, and answer their questions in a culturally and linguistically skilled manner. All Americans should have access to quality care that helps them achieve the best possible health.

With the publication of this eighth NHQR and NHDR, AHRQ stands ready to contribute to efforts that encourage and support the development of national, State, Tribal, and "neighborhood" solutions using national data and achievable benchmarks of care. These documents identify areas where novel strategies have made a difference in improving patients' quality of life, as well as many areas where much more should be done. Future reports will track the success of the National Health Care Quality Strategy, the National Prevention and Health Promotion Strategy, and the National Plan for Action to End Health Disparities.

We need to improve access to care, reduce disparities, and accelerate the pace of quality improvement, especially in the areas of preventive care, chronic disease management, and safety. More data are needed to assess progress in care coordination, efficiency, and health system infrastructure. Information needs to be shared with partners who have the skills and commitment to change health care. Building on data in the NHQR, NHDR, and State Snapshots, we believe that stakeholders can design and target strategies and clinical interventions to ensure that all patients receive the high-quality care needed to make their lives better.





# Chapter 1. Introduction and Methods

In 1999, Congress directed the Agency for Healthcare Research and Quality (AHRQ) to produce an annual report, starting in 2003, on “national trends in the quality of health care provided to the American people.”<sup>i</sup> With support from the Department of Health and Human Services and private-sector partners, AHRQ has designed and produced the National Healthcare Quality Report (NHQR) to respond to this legislative mandate. The NHQR provides a comprehensive overview of the quality of health care received by the general U.S. population and is designed to summarize data across a wide range of patient needs—staying healthy, getting better, living with chronic illness and disability, and coping with the end of life.

AHRQ was further tasked with producing an annual report that tracks “prevailing disparities in health care delivery as it relates to racial factors and socioeconomic factors in priority populations.”<sup>ii</sup> The National Healthcare Disparities Report (NHDR) has also been produced since 2003. The referenced priority populations consist of groups with unique health care needs or issues that require special focus, such as racial and ethnic minorities, low-income populations, and people with special health care needs. AHRQ’s charge includes a directive to examine disparities in health care access, utilization, costs, outcomes, satisfaction, and perceptions of care.

The NHQR and NHDR are complementary and are designed to be used together. Combined, they provide an annual snapshot of how our Nation’s health care system is performing and the extent to which health care quality and disparities have improved or worsened over time.

With support from a Department of Health and Human Services (HHS) Interagency Work Group and AHRQ’s National Advisory Council, AHRQ has designed and produced the NHQR and NHDR since 2003. This is the eighth in the series of reports. Over the years, the NHQR and NHDR have introduced refinements to the measure set and methodology, which has led to a focus on a subset of the most important and scientifically supported measures. These are referred to as the core measure set and are again the focus of the reports this year.

Refinements include the addition in 2004 of a second critical goal of the report series: tracking the Nation’s quality improvement progress. The 2005 reports introduced a set of core measures and a variety of new composite measures. The 2006 reports continued to improve data, measures, and methods, adding databases and measures and refining methods for quantifying and tracking changes in health care. The 2007 reports launched a new chapter on health care efficiency. The 2008 reports included an expanded chapter on patient safety, while the 2009 reports included new sections on lifestyle modification, healthcare-associated infection, and care coordination.

From the beginning, the Institute of Medicine (IOM) has helped shape these reports. Early planning for the first NHQR benefited from the IOM reports *Crossing the Quality Chasm* and *To Err Is Human*. Similarly, early planning for the first NHDR profited from the extensive literature review included in the IOM report *Unequal Treatment*. Moreover, before the publication of the first reports, AHRQ specifically requested that the IOM assist the Agency in meeting its congressionally mandated charge. The IOM was tasked with

---

<sup>i</sup> 42 U.S.C. 299b-2(b)(2).

<sup>ii</sup> 42 U.S.C. 299a-1(a)(6).

# Introduction and Methods

developing a vision for the two quality reports. With rapid changes in health care, AHRQ saw the need to review the reports for their appropriateness to the current health care environment.

In 2008, AHRQ again commissioned the IOM to review past reports and offer recommendations for enhancing future reports and associated products. To this end, the IOM established a consensus committee, the Committee on Future Directions for the National Healthcare Quality and Disparities Reports.<sup>iii</sup> The committee has offered recommendations on priority areas for health care quality improvement, measure selection, methodological approaches, and formatting and presentation of report findings.<sup>iv</sup>

This chapter summarizes AHRQ's methodological approach to producing the 2010 reports. While the 2010 reports contain almost all of the same measures tracked in previous versions of the NHQR and NHDR, many of the IOM's recommendations have been implemented, and the organization and content of the reports have changed extensively. Significant enhancements have been made to the reports to strengthen understanding of performance across the multiple dimensions of health care quality, better capture and track trends in disparities, and quantify the potential for future progress in meeting quality goals.

Consistent with past reports, the 2010 reports focus on a specific theme. In the 2010 reports, analyses include contrasts along the urban-rural continuum wherever data are available. With these refinements, the 2010 NHQR and NHDR substantively advance our Nation's understanding of the progress that is being made in improving quality and reducing disparities in the U.S. health care system.

## IOM Recommendations for Enhancing the NHQR and NHDR

The 2010 reports begin the process of incorporating suggestions from the IOM about how to maximize the utility of the reports and related products. AHRQ received recommendations from the IOM in April 2010. These recommendations guided the redesign of the 2010 NHQR and NHDR and are reflected throughout these reports. Some of the key recommendations from the IOM Committee are discussed below.

### Identify Priority Areas for Quality Improvement

The IOM recommended that AHRQ report on progress in selected priority areas. These priority areas are expected to yield the greatest gains in health care quality. Priorities include six areas identified by the National Priorities Partnership (NPP),<sup>v</sup> as well as two areas proposed by the IOM Committee. Measures selected for reporting reflect concepts captured in the priority areas, as listed below:

#### Priority areas designated by the NPP

- Patient and family engagement
- Population health

<sup>iii</sup> The committee's report is available at: [www.ahrq.gov/research/iomqdrreport](http://www.ahrq.gov/research/iomqdrreport).

<sup>iv</sup> In addition to guidance specific to the reports, the IOM provided recommendations about standardizing collection and coding of data on race, ethnicity, and language in the report *Race, Ethnicity, and Language Data*. We continue to seek opportunities to show data in the reports on disparities related to granular ethnicity and language preference, but such health care data are rare.

<sup>v</sup> The NPP is a partnership of public and private health care stakeholders who have come together to establish priorities and goals to eliminate harm to patients, eliminate health care disparities, and reduce disease burden and health system waste. More information on the National Priorities Partnership is available at: [www.nationalprioritiespartnership.org/Partners.aspx](http://www.nationalprioritiespartnership.org/Partners.aspx).



# Introduction and Methods

- Safety
- Care coordination
- Palliative care
- Overuse of services

## Priority areas designated by the IOM Committee

- Access to care
- Health system infrastructure

Some of these areas mapped directly into existing report sections and are included in those sections of each report. Patient and family engagement is covered in the chapter on Patient Centeredness. Safety is covered in the chapter on Patient Safety. Palliative care is covered in the section on Supportive and Palliative Care in the Effectiveness chapter.

Some areas mapped to sections in one report but not the other. Overuse is covered in the Efficiency chapter of the NHQR, but a corresponding chapter had to be developed for the NHDR. Access is covered in the Access to Care chapter of the NHDR, but a corresponding chapter had to be developed for the NHQR. Care coordination and health systems infrastructure were not covered well in any existing chapter, so new chapters were developed for both reports.

Population health measures cut across several of the quality dimensions and are included in multiple sections throughout both existing reports. Hence, performance on population health measures is not included as a separate chapter in this report. As appropriate, population health performance measures are reported in relevant chapters. For example, the population measure “adults with obesity who ever received advice from a health provider to exercise” is reported in Chapter 2, “Effectiveness,” in the Lifestyle Modification section. The concept of population health is also presented as an important focus of the Highlights.

## Adopt Updated Quality Framework

Measures selected for inclusion in the NHQR and NHDR examine performance in each of the priority areas listed above and are organized along the elements of a quality framework developed by the IOM Committee. The framework guiding the 2009 NHQR was focused around five dimensions of quality: (1) effectiveness, (2) patient safety, (3) timeliness, (4) patient/family centeredness, and (5) efficiency. The 2010 reports retain these quality dimensions and, in keeping with the suggestions offered by the IOM, introduce three others: access, care coordination, and health system infrastructure.



# Introduction and Methods

Similarly, the 2009 NHDR encompassed many of the NHQR measures focused on effectiveness of care, as well as access and care rendered to priority populations. The quality framework presented in Figure 1.1 applies equally well to the NHQR and NHDR. As such, the 2010 NHDR substantially expands the dimensions of quality by paralleling the structure and measures presented in the NHQR. “Efficiency,” a dimension of quality that was not included in previous disparities reports, has been added to the 2010 NHDR.

**Figure 1.1. Quality Framework for the 2010 NHQR and NHDR**

Crosscutting Dimensions		Components of Quality Care	Types of Care		
			Preventive Care	Acute Treatment	Chronic Condition Management
EQUITY	VALUE	Effectiveness			
		Safety			
		Timeliness			
		Patient/Family Centeredness			
		Access			
		Efficiency			
		Care Coordination			
Health Systems Infrastructure Capabilities					

**Source:** Ulmer C, Bruno M, Burke S, eds. Future directions for the National Healthcare Quality and Disparities Reports. Committee on Future Directions of the National Healthcare Quality and Disparities Reports, Institute of Medicine. Washington, DC: National Academies Press; 2010.

The revised quality framework posits that care coordination and health system infrastructure are foundational components that must be in place to achieve quality objectives in each of the other quality areas. Measures corresponding to elements of this quality framework are further described below in the section titled “Measure Set for the 2010 NHQR and NHDR.”

## Use Subnational Data

National data to assess performance and the presence of disparities in health care are unavailable for several key measures of quality. In many cases, these data are simply not being collected. The IOM recommends the use of subnational data (e.g., State-level data) to construct performance measures when national data are unavailable. For example, national data on the quality of care rendered to people with HIV/AIDS are generally unavailable. Data from the HIV Research Network, which represents 18 medical practices across the United States treating more than 14,000 patients with HIV/AIDS, were used in both the NHQR and NHDR to gather information on the care received by this population. Although not nationally representative, the data provide some insight into the care received by people with HIV/AIDS and may serve as a catalyst to expanded data collection at the national level.

# Introduction and Methods

## Expand Stratification

The IOM recommended that the NHDR stratify quality measures by the race and ethnicity categories identified by the Office of Management and Budget (OMB), primary language or English proficiency, and socioeconomic and insurance status. Past versions of the NHDR have reported quality measures according to these sociodemographic characteristics. The 2010 NHDR continues to include these categories and to show economic and insurance strata. The NHQR expands assessments of performance based on geographic region, specifically, analyses of quality and disparities across the urban-rural continuum.

## Modify Benchmarking Strategy

Performance and the potential for quality improvement are best evaluated relative to the evidence on what is achievable. Achievable benchmarks, which demonstrate the “best” attained performance on individual quality measures, were incorporated into the 2010 reports, per the recommendation of the IOM Committee. Identical benchmarks were used to characterize performance in both the NHDR and NHQR.

Benchmarks have been identified based on data from the top-performing States. In identifying the top-performing States, we calculated performance on selected measures separately with data from each of the 50 States.

States were ranked in order of performance and the top 10% were identified. The average performance among these top-ranking States was designated as the measure benchmark. Because data were not always available to estimate performance for each State, the 10% criterion was used only when data for a minimum of 30 States were reported.

## Create Action-Oriented Products

The NHQR and NHDR and related products should guide or support action. These reports may be made more actionable by including priority areas and benchmarks. Including examples of “best practices” would further emphasize the opportunities available to improve quality and reduce disparities.

## Track Access Better

The NHDR has traditionally included a chapter on access to care, identifying the facilitators and barriers to care and health care utilization experiences of subgroups defined by race and ethnicity, income, education, and type of health insurance. Pursuant to the IOM’s recommendations, a chapter on access to care, which has not been specifically tracked in the NHQR, has been added to the 2010 NHQR.

## How This Report Is Organized

NHQR and NHDR chapters are organized along the elements of the quality framework. Several of the proposed priority areas that are reflected in this framework have been monitored in previous quality and disparities reports; however, labels and organization of measures within chapters slightly differed. Measures that reflect the concepts underlying the newly defined priority list have been carried over to the 2010 reports and organized in chapters corresponding to the revised quality framework. Measures corresponding to

# Introduction and Methods

priority areas that are new to the 2010 reports were identified with the assistance of the Interagency Work Group and are noted in the description of chapters below.

For the first time, key findings from the NHDR are incorporated into relevant sections of the NHQR and major findings from the NHQR are mentioned in the NHDR. Integration of findings across the two reports emphasizes the interrelatedness of the two reports and provides a more robust description of the health care system's performance overall and for population subgroups.

## Continuing Chapters From Past Reports

- **Highlights**, which precedes this chapter, provides information to understand patterns of performance within priority areas, insight on the progress that has been made in advancing health care quality in the United States, and implications of report findings for meeting national performance objectives. The Highlights incorporate findings from both the NHQR and NHDR and the same Highlights chapter is used in both reports.
- **Chapter 1: Introduction and Methods** describes changes that have occurred between the 2009 and 2010 reports, such as modifications to the quality framework, measures added and excluded, and methodological changes in estimating and presenting data. An overall description of the measure set is also presented.
- **Chapter 2: Effectiveness** examines effectiveness of health care in the general U.S. population. The 2010 report is organized around eight clinical areas: cancer, diabetes, end stage renal disease (ESRD), heart disease, HIV and AIDS, maternal and child health, mental health and substance abuse, and respiratory diseases. Three types of health care services that typically cut across clinical conditions are also examined: lifestyle modification, functional status preservation and rehabilitation, and supportive and palliative care.
- **Chapter 3: Patient Safety** tracks measures of safety, including healthcare-associated infections, postoperative and other hospital complications, and preventable hospital deaths.
- **Chapter 4: Timeliness** examines the delivery of time-sensitive clinical care and patient perceptions of how quickly they receive care.
- **Chapter 5: Patient Centeredness** examines patients' experiences with care in an office or clinic setting, as well as during a hospital stay. Measures reported in this chapter focus on perceptions of communication with providers and satisfaction with the physician-patient relationship.
- **Chapter 10: Priority Populations** continues to be unique to the NHDR. This chapter summarizes quality and disparities in care for populations identified as particularly significant to quality improvement efforts:
  - Racial and ethnic minorities.
  - Low-income groups.
  - Women.
  - Children.
  - Older adults.
  - Residents of rural areas.
  - Individuals with disabilities or special health care needs.

## New Chapters for the 2010 Reports

- **Chapter 6: Care Coordination** is new to both the NHQR and NHDR. This chapter presents data to assess the performance of the U.S. health care system in coordinating care across providers or services. The quality framework identifies care coordination as a foundational dimension of quality, a component that facilitates the achievement of other health care system goals. Care coordination is represented by systems and processes that help patients successfully navigate across often disconnected health care components (e.g., physicians, hospitals, postacute services, social services) to meet their ongoing health needs. Measures of care coordination in the 2010 NHQR and NHDR address NPP goals, focusing on the adequacy of medical information received or obtained by providers, facilitators and barriers to care coordination, and outcomes associated with poorly coordinated care.

Measures included in both the quality and disparities reports are:

- Heart failure patients who receive complete discharge information.
  - Readmissions for congestive heart failure.
  - Provider communication with other physicians concerning a patient's medications.
  - Hospital electronic exchange of information.
  - Preventable emergency department visits for asthma.
- **Chapter 7: Efficiency** focuses in part on overuse of health services. Measures of health system efficiency, which capture information on how well the health care system promotes quality, affordable care, and appropriate use of services, have typically been reported in the NHQR but not the NHDR.

For the first time, the 2010 NHDR includes a chapter focusing on efficiency measures. These measures capture information on overuse, underuse, and misuse of health care among population subgroups.

Efficiency measures reported in the 2010 NHDR are:

- Potentially inappropriate prescriptions for older adults.
  - Rates of potentially avoidable hospitalizations.
  - Hospitalizations for conditions covered in AHRQ's Prevention Quality Indicators (PQIs).
  - Potentially avoidable hospitalizations among home health and nursing home patients.
  - Unnecessary services and costs, as measured by the percentage of males over age 75 who had a prostate-specific antigen test or a digital rectal exam within the previous year.
- **Chapter 8: Health Systems Infrastructure**, which explores the capacity of health care systems to support high-quality care, is new to both reports. The IOM recommended including health system infrastructure as a priority area because measuring performance in terms of health care infrastructure capacity can "[i]mprove the foundation of health care systems (including infrastructure for data and quality improvement; communication across settings for coordination of care; and workforce capacity and distribution...to support high-quality care."

# Introduction and Methods

Unlike most measures, health system capabilities were not assessed at the person level but according to region and provider characteristics. Infrastructure measures, which are primarily structural measures of quality, include:

- Distribution of U.S. pharmacy professionals.
  - Adoption of office-based computerized systems.
  - Hospital use of fully implemented computerized systems, by key functions.
  - Presence of hospital patient safety culture components (e.g., teamwork within units).
- **Chapter 9: Access** includes measures that focus on barriers to care, such as the U.S. population that is uninsured, financial barriers to care experienced by the population with health insurance, and people with a usual source of care. The NHDR has traditionally included a chapter on access to care, identifying facilitators and barriers to care and health care utilization of subgroups defined by race and ethnicity, income, education, and type of health insurance. Pursuant to the IOM's recommendations, a chapter on access to care, which has not been specifically tracked in the NHQR, has been added to the 2010 NHQR. Access is measured based on the following:
- Availability of health insurance.
  - Availability of a usual source of care.
  - Patient assessment of how easy it is to gain access to health care.
  - Successful receipt of needed services.

**Appendixes** are available online for both the NHQR and NHDR at [www.ahrq.gov/qual/qdr10.htm](http://www.ahrq.gov/qual/qdr10.htm). These appendixes include:

- **Data Sources**, which provides information about each database analyzed for the reports, including data type, sample design, and primary content.
- **Measure Specifications**, which provides information about how measures are generated and analyzed for the reports. Measures highlighted in the report are described, as well as other measures that were examined but not included in the text of the report.
- **Detailed Methods**, which provides detailed methodological and statistical information about selected databases analyzed for the reports.
- **Data Tables**, which contains detailed data tables for most measures analyzed for the reports, including measures highlighted in the report text and measures examined but not included in the text. A few measures cannot support detailed tables and are not included in the appendix.

## Theme of 2010 Reports

This year's focus on health care performance in rural and inner-city areas required the identification of a standardized approach to identifying communities by level of urbanization. With input from the Interagency Work Group, AHRQ selected the National Center for Health Statistics (NCHS) Urban-Rural Classification Scheme to guide analyses involving geographic location. The 2006 NCHS classification system is derived from data gathered from three sources: the OMB metropolitan and nonmetropolitan designations, the Rural-Urban Continuum and Urban Influence coding systems, and the U.S. Census. NCHS includes six urbanization categories, including four metropolitan and two nonmetropolitan county designations. Definitions of metropolitan and nonmetropolitan designations are shown in Table 1.1.

# Introduction and Methods

Although an effort was made to standardize reporting of data according to the NCHS classification system, a number of data sources collected this information using alternative classification models. For example, data in the National Survey on Drug Use and Health (NSDUH) were organized according to the classification system shown in Table 1.2. To the extent feasible, this classification system was modified to correspond to the 2006 NCHS classification scheme. Because correspondence between the NSDUH's nonmetropolitan subgroups and that of the NCHS classification system was poor, for purposes of analysis, nonmetropolitan regions were not subset. Thus, NSDUH performance measures are reported for three metropolitan subgroups and for nonmetropolitan regions as a whole. In other cases, where source data did not provide sufficient detail to adapt to the NCHS model, analyses of performance used aggregated categories (e.g., metropolitan versus nonmetropolitan.)

**Table 1.1. 2006 NCHS Urban-Rural Classification System**

<b>Metropolitan</b>	
Large central metropolitan	Counties in a metropolitan statistical area of 1 million or more population: <ol style="list-style-type: none"> <li>1. That contain the entire population of the largest principal city of the metropolitan statistical area, or</li> <li>2. Whose entire population resides in the largest principal city of the metropolitan statistical area, or</li> <li>3. That contain at least 250,000 of the population of any principal city in the metropolitan statistical area</li> </ol>
Large fringe metropolitan	Counties in a metropolitan statistical area of 1 million or more population that do not qualify as large central
Medium metropolitan	Counties in a metropolitan statistical area of 250,000 to 999,999 population
Small metropolitan	Counties in a metropolitan statistical area of 50,000 to 249,999 population
<b>Nonmetropolitan</b>	
Micropolitan	Counties with urban population of 20,000 to 49,999, adjacent to metro area
Noncore	Counties that are neither metropolitan nor micropolitan

**Source:** Ingram D, Franco S. 2006 Rural-Urban Classification Scheme for Counties. Centers for Disease Control and Prevention, NCHS, 2006. Available at [www.cdc.gov/nchs/data\\_access/urban\\_rural.htm](http://www.cdc.gov/nchs/data_access/urban_rural.htm).

**Table 1.2. NSDUH data classification and modified classification for metropolitan and nonmetropolitan communities**

<b>NSDUH Rural/Urban Classification</b>	<b>Modified NSDUH Classification for NHQR and NHDR</b>
<b>Metropolitan</b>	
Large metropolitan	Large central and fringe metropolitan
Small metropolitan 250K-1,000,000	Medium metropolitan
Small metropolitan <250K	Small metropolitan
<b>Nonmetropolitan</b>	
Urbanized = 20,000 or more	Excluded from analyses
Less urbanized = 2,500-20,000	Excluded from analyses
Completely rural = 2,500 or less	Excluded from analyses



# Introduction and Methods

## Measure Set for the 2010 NHQR and NHDR

### Retired Measures

Previous reports have demonstrated that some measures of health care quality have improved. Since the first NHQR and NHDR, significant improvements in a number of measures of quality of care have occurred, with U.S. health care providers achieving overall performance levels exceeding 95%. The success of these measures limits their utility for tracking improvement over time. Because these measures cannot improve further to a significant degree, including them in the measure set creates a ceiling effect that may distort quantification of rate of change over time. Data on retired measures will continue to be collected and these measures will be added back to the reports if their performance falls below 95%. For the 2010 report, no measures have been retired or added back.

The measures that were retired in 2009 and therefore not presented in the 2010 report are:

- Adults with diabetes who had their blood cholesterol checked.
- Hospital patients with heart attack who received aspirin within 24 hours of admission.
- Hospital patients with heart attack who were prescribed aspirin at discharge.
- Hospital patients with heart attack who were prescribed a beta blocker at discharge.
- Smokers with heart attack who received smoking cessation counseling while hospitalized.

### Core Measures

The NHQR and NHDR track a broad array of health care measures and have added measures each year. The 2010 reports continue to focus on a consistent subset of measures, the “core” measures, which includes the most important and scientifically supported measures in the full measure set. In 2005, the Interagency Work Group selected the core measures from the full measure set. For most core measures, findings are presented each year. A subset of the core measure group is presented on an alternating basis, typically rotating across odd or even years of the report. All alternating core measures are included in trend analyses. “Noncore” measures are included in summary statistics and may be presented to complement core measures in key areas.

Examples of alternating measures include the set of measures focusing on breast cancer and colorectal cancer. While measures are annually tracked, breast cancer measures are presented in odd calendar years; these measures were contained in the 2009 reports. Colorectal cancer measures are also tracked annually, but results are presented in even calendar years, such as in the 2010 quality and disparities reports.

### Composite Measures

Policymakers and others have voiced their support for composite measures of quality because they can be used to facilitate understanding of information from many different measures. A composite measure summarizes care that is represented by individual measures that are often related in some way, such as components of care for a particular disease or illness. Composite measures are composed of two or more

# Introduction and Methods

process<sup>vi</sup> or outcome<sup>vii</sup> measures that have been recommended or identified as a “best practice” in the treatment or prevention of complications associated with specific conditions, such as diabetes. Since measures used to construct composites represent various dimensions or processes of care, they provide a more complete understanding of the quality of the U.S. health care system. To ensure that actionable information is available, estimates of performance on the individual measures that make up a composite measure are available in an appendix to these reports.

Decisions concerning the appropriateness of pooling data to generate a composite measure were discussed with data sources. Several of the composite measures included in the reports were developed, tested, and estimated by the data source or other public or private organizations for use in quality assessment, monitoring, and improvement activities.

Composite measures in the NHQR and NHDR are created in a variety of different ways. The appropriateness model is sometimes referred to as the “all-or-none” approach because it is calculated based on the number of patients who received all of the services they needed. One example of this model is the diabetes composite, in which a patient who receives only one or two of the three recommended services would not be counted as having received all recommended care.

The opportunities model assumes that each patient needs and has the opportunity to receive one or more processes of care, but not all patients need the same care. Composite measures that use this model summarize the proportion of appropriate care that is delivered. The denominator for an opportunities model composite is the sum of opportunities to receive appropriate care across a panel of process measures. The numerator is the sum of the components of appropriate care that are actually delivered.

The composite measure of recommended hospital care for heart failure is an example of the use of the opportunities model. The total number of patients who receive treatments represented by individual components of the composite measure (e.g., evaluation of left ventricular ejection fraction and use of angiotensin-converting enzyme (ACE) inhibitor or angiotensin receptor blocker (ARB) among patients with left ventricular systolic dysfunction) is divided by the sum of all of the opportunities to receive appropriate care.

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

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

<sup>vi</sup> “Receipt of three recommended diabetes services” is one example of a composite process measure. This composite was formed by combining information on adults with diabetes who received the following clinical preventive services: hemoglobin A1c measurement, a dilated eye exam, and a foot exam.

<sup>vii</sup> “Adults with ambulatory visits who reported poor communication with health providers” is an example of a composite outcome measure. This composite was formed by combining information on patient perceptions of their providers, including the extent to which the provider listened to the patient, respect shown by the provider, time spent with the patient, and explanations offered by providers.

# Introduction and Methods

## Other Measure Characteristics

Core and noncore measures may be characterized as “process” or “outcome” measures. Process measures track receipt of medical services and whether providers rendered care according to accepted standards. Outcome measures are indicative of the result or impact of medical care. Many factors other than the care received affect health outcomes; these include lifestyle, social and physical environment, and genetic predisposition to disease. Therefore, outcome measures are typically adjusted for risk or patient characteristics that may influence outcomes.

Both process and outcome measures are included in the 2010 NHQR and NHDR; both types of measures are not reported for all conditions due to data limitations. For example, data on HIV care are suboptimal, so no HIV process measures are included as core measures. In addition, not all core measures are included in trending analysis, because 3 or more years of data are not always available. Ideally, process measures and related outcome measures would be tracked in tandem. In reality, data are typically unavailable to examine the relationship between structural, process, and outcome measures.

Process measures reported in the NHQR and NHDR, particularly in the chapter on effectiveness, are grouped into categories related to the type of care: prevention, acute treatment, and chronic disease management. There is a sizable overlap among the care types and some measures may be considered to belong in more than one type of care category.

- **Prevention.** Caring for healthy people is an important component of health care. Educating people about healthy behaviors and lifestyle modification can help to postpone and avoid illness and disease. In addition, detecting health problems at an early stage increases the chances of effectively treating them, often reducing suffering and costs. Many of the preventive measures tracked in the reports come from the U.S. Preventive Services Task Force and the Centers for Disease Control and Prevention Advisory Committee on Immunization Practices.
- **Treatment.** Even when preventive care is ideally implemented, it cannot entirely avert the need for acute care. Delivering optimal treatment for acute illness can help reduce the effects of illness and promote the best recovery possible.
- **Management.** Some diseases, such as diabetes and ESRD, are chronic, which means they cannot simply be treated once; they must be managed across a lifetime. Management of chronic disease often involves lifestyle changes and regular contact with a provider to monitor the status of the disease. For patients, effective management of chronic disease can mean the difference between healthy living and frequent medical problems.

A list of core measures included in the 2010 NHQR and NHDR is shown in Table 1.3 at the end of this chapter. Measures are identified according to the priorities addressed, dimension or type of care, and focus on structure (access), process (prevention, acute care, chronic care), or outcome of care. The table also notes whether a measure is a composite measure.

## Analyses

In the NHQR, measures are tracked for different groups, such as age, gender, and geographic location. In the NHDR, comparisons are made across groups defined by race, ethnicity, income, education, activity limitations, and geographic location. In general, either the largest subgroup or the best performing subgroup

# Introduction and Methods

is used as the reference; unless specified, this would typically be individuals ages 18–44 for age contrasts, individuals with private health insurance for insurance contrasts, and non-Hispanic Whites for racial contrasts.

Two criteria are applied to determine whether the difference between two groups is meaningful:

1. First, the difference between the two groups must be statistically significant with  $p \leq 0.05$  on a two-tailed test.
2. Second, the relative difference between the comparison group and the reference group must be at least 10% when the measure is framed positively as a favorable outcome or negatively as an adverse outcome.

To further address the interrelationships among measures, group demographic characteristics, and socioeconomic factors, multivariate regression analyses were conducted for a small number of measures that had data available to examine the relationship between the measure, race/ethnicity, and socioeconomic factors. These analyses, which are shown for selected measures in the NHDR chapter on priority populations, generated adjusted percentages that quantify the magnitude of disparities after controlling for a number of confounding factors. For example, results of multivariate analyses are shown for an effectiveness measure—the percentage of people with diabetes who received recommended care for diabetes. Values of these measures are compared for different racial and ethnic groups after adjusting for differences in the distributions of income, education, insurance, age, gender, and geographic location.

## Annual Rates of Change and Trend Analyses

For all measures for which reliable trend data are available, analyses are conducted to assess the annual rate of change. The 2010 reports use regression analysis to estimate average annual rate of change. Regression models were specified as follows:

$$\ln(M) = \beta_0 + \beta_1(Y), \text{ where}$$

$\ln(M)$  = natural logarithm of the measure value (M)  
 $\beta_0$  = intercept or constant  
 $\beta_1(Y)$  = coefficient corresponding to year (Y)

Using regression results, the average annual rate of change was calculated as  $100 \times (\exp(\beta_1) - 1)$ .

Data in the NHQR/NHDR are unavailable at the person level and aggregated estimates are used throughout analyses. The regression-estimated annual rate of change was reported only when at least three data points—or 3 years of aggregated data—were available for a measure.

For inclusion as either improving or getting worse, the average annual rate of change must be at least 1% per year when the measure is framed positively as a favorable outcome or negatively as an adverse outcome.

Progress on individual measures is reported as follows:

- Progress on a measure is deemed to be improving or getting better if the annual rate of change is 1% or greater, in the desirable direction.
- Progress on a measure is deemed to be getting worse when the annual rate of change is 1% or greater, in the undesirable direction.
- Progress has remained the same if the annual rate of change is  $\leq 1\%$  in either the desirable or undesirable direction.

# Introduction and Methods

Across subpopulation groups, average annual change was estimated to ascertain the extent to which disparities in quality and access measures were increasing, decreasing, or remaining the same over time. Calculation of change in disparities was conducted in a manner similar to that described above, with the exception that a linear regression (as opposed to a log-linear regression) was used to estimate annual change for population subgroups. Change in disparities was estimated as the difference in the average annual change between the comparison and reference groups. Measures for which the difference between groups was  $>1$  indicate that the disparity is getting larger whereas differences  $< -1$  indicate that the size of the disparity is getting smaller. Values between  $-1$  and  $1$  suggest that group differences have not changed over time. Due to methodological changes over time, changes in data used to construct measures across years, and changes to the measure set, it is not appropriate to compare the annual change or rates of change for measure groups discussed in this year's report with those from prior years.

## Summary Measures in the Highlights

The Highlights chapter reports findings across broad panels of measures. Contained in the highlights are summary data detailing:

- Measures or groups of measures for which selected population groups (e.g., race/ethnicity, income, metropolitan and nonmetropolitan groups) performed better, worse, or the same as the reference group;
- Distribution of change over time in quality and access measures for population subgroups; and
- Change in quality and access over time, by type of service (preventive care, acute care, chronic disease management) and outcomes.

This process is more complicated because data on all measures are not collected each year. In the summary trend analyses, we obtain all available data points between the year 2000 and the current data year for each measure. For most measures, trends include data points from 2001/2002 to 2007/2008. Composite measures are included in the core measure category. To avoid duplication of estimates within the other categories, composite measures are not included in other categories where estimates from their component measures are used. For example, the diabetes composite measure (which includes hemoglobin A1c measurement, eye exam, and foot exam) contributes to the overall rate for the core measures group but not to the diabetes group rate, which uses the estimates from the three noncore component measures.

Using the analytic approach previously described, we calculated the sum of measures that were identified as better, worse, or the same (when considering subgroup differences) or that were improving, worsening, or remaining the same over time (when considering trend data). The distribution of measures by subpopulation, type of service, or type of measure (i.e., quality or access) are presented as a way to summarize the status of health care quality and disparities in the United States.

Standardization of language to describe differences in the value of a measure across time and subgroups is part of the effort by HHS and AHRQ to provide information on where the Nation is—and is not—making progress in reducing disparities in health care. Furthermore, as detailed below, the use of benchmarks, or “best known level of attained performance,” provides an additional way to monitor progress. It also offers an approach to measuring disparities by projecting the amount of time that would be needed for selected groups to achieve the benchmarks.



# Introduction and Methods

## Benchmarks

Pursuant to the IOM's recommendations, when data were available, the 2010 NHQR and NHDR include measure-specific benchmarks that reflect the highest level of performance documented for individual measures. Benchmarks enable readers to assess national and State performance relative to that of the highest performing States, organizations, and other entities. They also aid in establishing reasonable performance improvement goals. From an equity perspective, standards of performance should not differ across population groups. As such, benchmarks corresponding to measures included in both the NHQR and NHDR were identical.

For measures for which they are reported, benchmarks were estimated as the measure average for the 10% of States that had the best performance on the measure of interest. For benchmarking purposes, the District of Columbia is treated as a State. Benchmarks were estimated only if data were available for a minimum of 30 States. Before settling on the approaches used, we considered alternative methods for designating benchmarks. One method would have limited "best attained performance" to the one State with the highest performance on a measure. This approach was rejected because of concerns about the reliability of data from one State, especially if the State is unique in terms of the characteristics of the population, health care infrastructure, or practice patterns. The top-performing State may simply be an outlier.

State-level estimates used in constructing benchmarks were primarily calculated from the same data source as the measure. In some cases, such as when the number of individuals sampled from a specific State was too small, data did not support estimation at a subnational level and benchmarks were not identified. We made exceptions for three measures derived from the Medical Expenditure Panel Survey (MEPS) and the National Health Interview Survey (NHIS). For these measures of colorectal cancer screening, diabetes care, and pneumococcal vaccination, almost identical data were available from Behavioral Risk Factor Surveillance Survey (BRFSS) State data. However, BRFSS sampling and mode of administration differ from MEPS and NHIS. Hence, to calculate a benchmark for these measures, we first calculated the ratio of the top 10% achievable benchmark to the overall national estimate from BRFSS. We then applied this ratio to the overall national estimates from MEPS or NHIS. For example, if the BRFSS benchmark to national estimate for a measure was 1.5, we would multiply the national estimate for that measure from MEPS by 1.5 to obtain a corresponding benchmark.

## Time To Achieve Benchmark

Also new to the 2010 reports are projections of the time expected for population subgroups to achieve the designated benchmark, based on past performance. Using standard linear regression of the actual values over time and extrapolating to future years, we calculated the time required for the population, or population subgroup, to perform at the level of the top-performing States. Since projections of future performance were based on past performance data, it was necessary to ensure reliability by limiting estimates to those cases in which at least three data points were available.

An important caveat to consider in using information on time to achieve benchmarks is that the linear estimation approach used to derive these estimates assumes that characteristics of the population, technology, and health care infrastructure remain constant. Changes in the characteristics of the population or health care system may be expected to alter achievement of benchmarks. Advancements in medical science, changes in the organization of health services, or reductions in the uninsured population following implementation of the Patient Protection and Affordable Care Act (P.L. 111-148) would be expected to alter the performance trajectory. In some cases, the time to achieve the benchmark will drop, while in other cases it may increase.



# Introduction and Methods

Time to achieve the benchmark was not estimated for all measures in the NHQR and NHDR. Time to benchmark is not reported if:

- The average annual rate of change in a measure is less than 1%.
- The time to benchmark is estimated at 25 or more years.
- Trends over time show movement away from the benchmark (these occurrences are mentioned in the reports).
- The direction or trend changes over time; operationally, these were identified as cases in which there are at least 4 years of data showing “upward” movement and at least 4 years of data showing “downward” movement.

## Quantifying Disparities

In the Highlights and Priority Populations chapters of the NHDR, the extent of disparities across the core measures is summarized for Black, Hispanic, Asian, Native Hawaiian and Other Pacific Islander (NHOPI), American Indian and Alaska Native (AI/AN), and poor populations. Racial, ethnic, and socioeconomic groups are compared with a designated reference group for each core measure. Each group could receive care that is worse than, about the same as, or better than the reference group. For each group, the percentages of measures for which the group received worse care, similar care, or better care were calculated.

In the Priority Populations chapter of the NHDR, which presents information on each population separately, all core measures with available data are used when summarizing trends in disparities across groups. For example, much less information is available for income groups than for racial and ethnic groups. Rates relative to standard reference groups are used to quantify the magnitude of disparities and to identify the largest disparities specific groups face. For each group, the group rate was divided by the reference group rate to calculate the relative rate for each core measure, with each core measure framed negatively (e.g., for immunization, the likelihood of not receiving the vaccine). Relative rates of selected core measures are presented in the Highlights chapter of the reports.

## Presentation of Reports

As in past reports, the NHQR and its companion NHDR continue to be formatted as chartbooks. Each chapter begins with a description of the importance of the topic. After introductory text, charts and accompanying findings highlight a small number of measures relevant to the topic. Where applicable, key findings from the NHDR are included in the NHQR, and NHQR findings are reported in the text of the NHDR. Readers should refer to the report from which results have been drawn to gather additional details on the data presented.

Unless otherwise stated, only those findings that meet the “meaningfulness criteria,” as previously described, are presented in the bullets that accompany each figure. When these data are available and relevant, the NHQR charts show contrasts by:

- Age.<sup>viii</sup>
- Gender.
- Insurance status.
- Geographic location (rural versus urban).

<sup>viii</sup> Unless otherwise specified, the NHQR and NHDR define children as individuals under the age of 18; adults include people age 18 and over.

# Introduction and Methods

To the extent that data are available, charts in the NHDR typically show contrasts by:

- Race: Whites, Blacks, Asians,<sup>ix</sup> NHOPIs, AI/ANs, and people of more than one race.
- Ethnicity: Hispanics and non-Hispanics.<sup>x</sup>
- Income: Poor, near poor, middle income, and high income.<sup>xi</sup>
- Education: People with less than a high school education, high school graduates, and people with at least some college education.

When data support stratified analyses, a figure showing racial and ethnic differences stratified by socioeconomic factors is included. These data are summarized in bullet format. Figures include a note about the reference group for population-based measures and the unit of analysis for measures based on services or events.

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

To systematically identify the relationship between geographic location and quality of care, when possible, findings in the NHQR and NHDR show measures of quality of care for individuals residing along the urban-rural continuum described above.

## Defining Individuals With Disabilities

For the purpose of the NHDR, people with disabilities are those with physical, sensory, and/or mental health conditions who also have an associated decrease in functioning in such day-to-day activities as bathing, walking, doing everyday chores, and/or engaging in work or social activities. This is consistent with the Americans With Disabilities Act (ADA) of 1990,<sup>xii</sup> which defines disability to include “a physical or mental impairment that substantially limits one or more major life activities of such individual” as well as with Federal program definitions based on the ADA.

In displaying the data on disability, paired measures are shown to preserve the qualitative aspects of the data:

- Limitations in basic activities represent problems with mobility and other basic functioning at the person level.
- Limitations in complex activities represent constraints encountered when people, in interaction with their environment, attempt to participate in community life.

<sup>ix</sup> Asian includes the former category of Asian or Pacific Islander prior to Office of Management and Budget guidelines, when information was not collected separately by group.

<sup>x</sup> Not all data sources used in the NHDR collect information by race and ethnicity separately. In such cases, comparisons are made by combining racial/ethnic group categories (e.g., comparing non-Hispanic Blacks and Hispanics with non-Hispanic Whites.)

<sup>xi</sup> Unless otherwise indicated, throughout this report, poor is defined as having family income less than 100% of the Federal poverty level (FPL); near poor refers to incomes between 100% and 200% of the FPL; middle income refers to incomes between 200% and 400% of the FPL, and high income includes incomes 400% or more of the FPL. These are based on U.S. Census poverty thresholds for each data year, which are used for statistical purposes.

<sup>xii</sup> 42 U.S.C. 12102.

# Introduction and Methods

The use of paired measures of basic and complex activity limitations is conceptually similar to the way others have defined “disability.” It is also consistent with the International Classification of Functioning, Disability, and Health separation of activities and participation domains. These two categories are not mutually exclusive; people may have limitations both in basic activities and complex activities. Further information can be found in the Individuals With Disabilities or Special Health Care Needs section of the NHDR, in the chapter on Priority Populations.

**Table 1.3. Core measures included in the 2010 NHQR and NHDR, by measure characteristic**

Measure	Dimension or Type of Care					Composite Measure
	Access	Prevention	Acute Care	Chronic Care	Outcome	
<b>Effectiveness</b>						
<b>Cancer (alternating measures)<sup>xiii</sup></b>						
Adults age 50 and over who ever received colorectal cancer screening		✓				✓
Rate of advanced stage colorectal cancer per 100,000 adults age 50 and over		✓			✓	
<b>Diabetes</b>						
Hospital admissions for lower extremity amputations per 1,000 adult patients with diagnosed diabetes					✓	
Adults age 40 and over with diagnosed diabetes who received all three recommended services for diabetes in the calendar year (hemoglobin A1c measurement, dilated eye examination, and foot examination)				✓		✓
<b>End Stage Renal Disease</b>						
Adult hemodialysis patients with adequate dialysis (urea reduction ratio 65% or greater)				✓	✓	
Dialysis patients under age 70 who were registered on a waiting list for transplantation				✓		

<sup>xiii</sup> Cancer measures alternate by year. Data on colorectal cancer are presented in “even year” reports, and data on breast cancer are presented in “odd year” reports.

# Introduction and Methods

**Table 1.3. Core measures included in the 2010 NHQR and NHDR, by measure characteristic**

Measure	Dimension or Type of Care					Composite Measure
	Access	Prevention	Acute Care	Chronic Care	Outcome	
<b>Heart Disease</b>						
Hospital patients with heart attack and left ventricular systolic dysfunction who received ACE inhibitor or ARB			✓			
Hospital patients with heart failure who received recommended hospital care (evaluation of left ventricular ejection fraction and ACE inhibitor or ARB prescription at discharge, if indicated)			✓			✓
Deaths per 1,000 adult hospital admissions with heart attack					✓	
<b>HIV/AIDS</b>						
New AIDS cases per 100,000 population age 13 and over					✓	
<b>Maternal and Child Health</b>						
Women who completed a pregnancy in the last 12 months who first received prenatal care in the first trimester*		✓				
Children ages 19-35 months who received all recommended vaccines		✓				✓
Children ages 3-6 who ever had their vision checked by a health provider (alternating measure)		✓				
Children ages 2-17 for whom a health provider ever gave advice about the amount and kind of exercise, sports, or physically active hobbies they should have		✓				
Children ages 2-17 for whom a health provider ever gave advice about healthy eating		✓				
Infant deaths per 1,000 live births, birth weight less than 1,500 g*					✓	

\* No new data.

# Introduction and Methods

**Table 1.3. Core measures included in the 2010 NHQR and NHDR, by measure characteristic**

Measure	Dimension or Type of Care					Composite Measure
	Access	Prevention	Acute Care	Chronic Care	Outcome	
<b>Mental Health and Substance Abuse</b>						
Adults with a major depressive episode in the last 12 months who received treatment for depression			✓			
People age 12 and over who needed treatment for illicit drug use or an alcohol problem and who received such treatment at a specialty facility in the last 12 months			✓			
Suicide deaths per 100,000 population		✓			✓	
<b>Respiratory Diseases</b>						
Adults age 65 and over who ever received pneumococcal vaccination		✓				
People with current asthma who are now taking preventive medicine daily or almost daily (either oral or inhaler)				✓		
Hospital patients with pneumonia who received recommended hospital care (initial antibiotics within 6 hours of hospital arrival; antibiotics consistent with current recommendations; blood culture before antibiotics are administered; influenza vaccination status assessment/vaccine provision; and pneumococcal vaccination status assessment/vaccine provision)			✓			✓
Patients with tuberculosis who completed a curative course of treatment within 1 year of initiation of treatment			✓		✓	

# Introduction and Methods

**Table 1.3. Core measures included in the 2010 NHQR and NHDR, by measure characteristic**

Measure	Dimension or Type of Care					Composite Measure
	Access	Prevention	Acute Care	Chronic Care	Outcome	
<b>Lifestyle Modification</b>						
Adult current smokers with a checkup in the last 12 months who received advice to quit smoking		✓				
Adults with obesity who ever received advice from a health provider to exercise more		✓				
<b>Functional Status Preservation and Rehabilitation</b>						
Older women who reported ever being screened for osteoporosis		✓				
Adult home health care patients whose ability to walk or move around improved				✓	✓	
Long-stay nursing home residents whose need for help with daily activities increased				✓	✓	
<b>Supportive and Palliative Care</b>						
Adult home health care patients with shortness of breath				✓	✓	
High-risk long-stay nursing home residents with pressure sores				✓	✓	
Short-stay nursing home residents with pressure sores				✓	✓	
Long-stay nursing home residents with physical restraints				✓		
<b>Patient Safety</b>						
Adult surgery patients who received appropriate timing of antibiotics (prophylactic antibiotics begun at the right time and ended at the right time)			✓			✓
Adults age 65 and over who received potentially inappropriate prescription medications			✓		✓	
Adult surgery patients with postoperative complications					✓	



# Introduction and Methods

**Table 1.3. Core measures included in the 2010 NHQR and NHDR, by measure characteristic**

Measure	Dimension or Type of Care					Composite Measure
	Access	Prevention	Acute Care	Chronic Care	Outcome	
Bloodstream infections or mechanical adverse events associated with central venous catheter placement					✓	
Deaths per 1,000 discharges potentially resulting from care (failure to rescue)					✓	
<b>Timeliness</b>						
Adults who needed care right away for an illness, injury, or condition in the last 12 months who got care as soon as wanted					✓	
Emergency department visits in which patients left without being seen					✓	
<b>Patient Centeredness</b>						
Children with ambulatory visits whose parents reported poor communication with health providers					✓	✓
Adults with ambulatory visits who reported poor communication with health providers					✓	✓
<b>Access</b>						
People under age 65 with health insurance	✓					
People under age 65 who were uninsured all year	✓					
People with a usual primary care provider	✓					
People without a usual source of care who indicated a financial or insurance reason for not having a source of care	✓					
People with a specific source of ongoing care	✓					
People who were unable to get or delayed in getting needed medical care, dental care, or prescription medicines in the last 12 months	✓					✓

## Chapter 2. Effectiveness of Care

As better understanding of health and sickness has led to superior ways of preventing, diagnosing, and treating diseases, the health of most Americans has improved dramatically. However, ample evidence indicates that some Americans do not receive the full benefits of high-quality care.

This chapter is organized around eight clinical areas (cancer, diabetes, end stage renal disease [ESRD], heart disease, HIV and AIDS, maternal and child health, mental health and substance abuse, and respiratory diseases) and three types of health care services that typically cut across clinical conditions (lifestyle modification, functional status preservation and rehabilitation, and supportive and palliative care). The 11 sections of this chapter highlight a small number of core and supporting measures.

In this chapter, process measures are organized into several categories related to the patient's need for preventive care, treatment of acute illness, and chronic disease management. These are derived from the original Institute of Medicine (IOM) categories: staying healthy, getting better, living with illness or disability, and coping with the end of life. There is sizable overlap among these categories, and some measures may be considered to belong in more than one category. Outcome measures are organized separately because prevention, treatment, and management can all play important roles in affecting outcomes.

### Prevention

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

### Treatment

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

### Management

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

### Outcomes

Many factors other than health care influence health outcomes, including a person's genes, lifestyle, and social and physical environment. However, for many individuals, appropriate preventive services, timely treatment of acute illness and injury, and meticulous management of chronic disease can positively affect mortality, morbidity, and quality of life.

# Effectiveness of Care

## Cancer

### Importance

#### Mortality

Number of deaths (2007).....	562,875 <sup>1</sup>
Cause of death rank (2007) .....	2nd <sup>1</sup>

#### Prevalence

Number of living Americans who have been diagnosed with cancer (2007) .....	11,713,736 <sup>2</sup>
---	-------------------------

#### Incidence

New cases of cancer (2010) .....	1,529,560 <sup>3</sup>
New cases of colorectal cancer (2010) .....	209,060 <sup>3</sup>

#### Cost

Total cost <sup>i</sup> (2010 est.) .....	\$263.8 billion <sup>4</sup>
Direct costs <sup>ii</sup> (2010 est.) .....	\$102.8 billion <sup>4</sup>
Indirect costs (2010 est.).....	\$161.0 billion <sup>4</sup>
Cost-effectiveness <sup>iii</sup> of colorectal cancer screening .....	\$35,000-\$165,000/QALY <sup>5</sup>

### Measures

Evidence-based consensus defining good quality care and how to measure it currently exists for only a few cancers and a few aspects of care. Breast and colorectal cancers have high incidence rates and are highlighted in alternate years of the report. The 2009 National Healthcare Quality Report (NHQR) highlighted breast cancer; this year's focus is on colorectal cancer. The core report measures are:

- Colorectal cancer screening.
- Colorectal cancer first diagnosed at advanced stage.
- Colorectal cancer deaths.

As in previous reports, the 2010 NHQR includes one supporting measure for colorectal cancer care from the National Cancer Data Base that has been endorsed by the National Quality Forum:

- Surgical resection of colon cancer that includes at least 12 lymph nodes.

<sup>i</sup> Throughout this report, total cost equals cost of medical care (direct cost) and economic costs of morbidity and mortality (indirect cost).

<sup>ii</sup> Direct costs are defined as “personal health care expenditures for hospital and nursing home care, drugs, home care, and physician and other professional services.”<sup>24</sup>

<sup>iii</sup> Cost-effectiveness is measured here by the average net cost of each quality-adjusted life year (QALY) that is saved by the provision of a particular health intervention. QALYs are a measure of survival adjusted for its value: 1 year in perfect health is equal to 1.0 QALY, while a year in poor health would be something less than 1.0. A lower cost per QALY saved indicates a greater degree of cost-effectiveness.

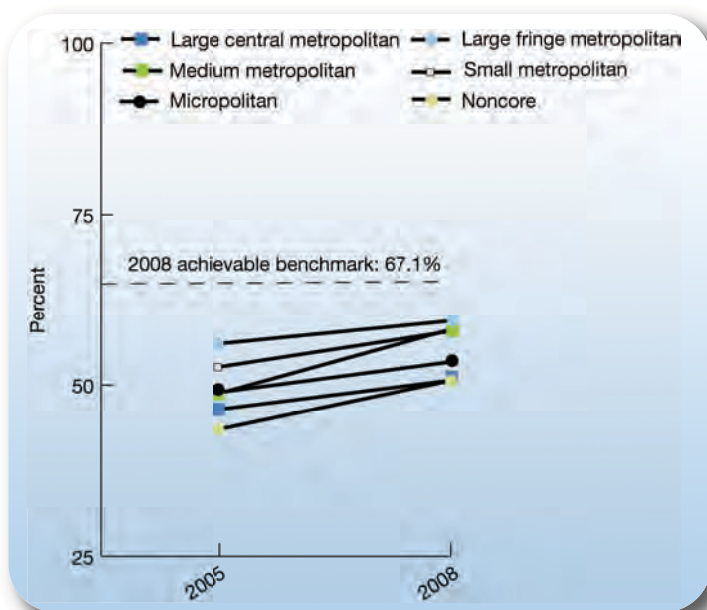
## Findings

### Prevention: Colorectal Cancer Screening

Colorectal cancer is the third most common cancer in adults.<sup>3</sup> Prevention of colorectal cancer includes modifying risk factors such as weight, physical activity, smoking, and alcohol use, as well as screening for early disease. Screening is important because early stages of colorectal cancer may not present any symptoms, and screening can detect abnormal growths before they develop into cancer.<sup>3, 6</sup>

Early detection increases treatment options and the chances for survival. The U.S. Preventive Services Task Force recommends colorectal cancer screening for men and women age 50 and over. The screening measured in the NHDR includes having a fecal occult blood test in the past 2 years or ever having received flexible sigmoidoscopy, colonoscopy, or proctoscopy.

**Figure 2.1. Adults age 50 and over who reported having received colorectal cancer screening (received fecal occult blood test in past 2 years or ever received colonoscopy, sigmoidoscopy, or proctoscopy), by residence location, 2005 and 2008**



**Source:** Centers for Disease Control and Prevention, National Center for Health Statistics, National Health Interview Survey, 2005 and 2008.

**Denominator:** Adults age 50 and over in the civilian noninstitutionalized population.

**Note:** Estimates are age adjusted to the standard population except where indicated. Benchmark is derived from the Behavioral Risk Factor Surveillance System (BRFSS); see Introduction and Methods for details.

- The overall percentage of adults age 50 and over who reported having received colorectal cancer screening significantly increased from 51.9% in 2005 to 56.3% in 2008 (data not shown).
- In 2005 and 2008, the percentage of adults age 50 and over residing in large fringe metropolitan areas who reported having received colorectal cancer screening was significantly higher than it was for adults residing in large central metropolitan and noncore<sup>iv</sup> areas (Figure 2.1).

<sup>iv</sup> Noncore areas are outside of metropolitan or micropolitan statistical areas. Micropolitan and noncore areas are typically regarded as “rural.”

# Effectiveness of Care

- Between 2005 and 2008, the percentage of adults age 50 and over who reported they ever received colorectal cancer screening increased significantly for residents of large central and medium metropolitan areas.
- The top 5 State achievable benchmark was 67.1%.<sup>v</sup> The available data are not sufficient to calculate time to benchmark.

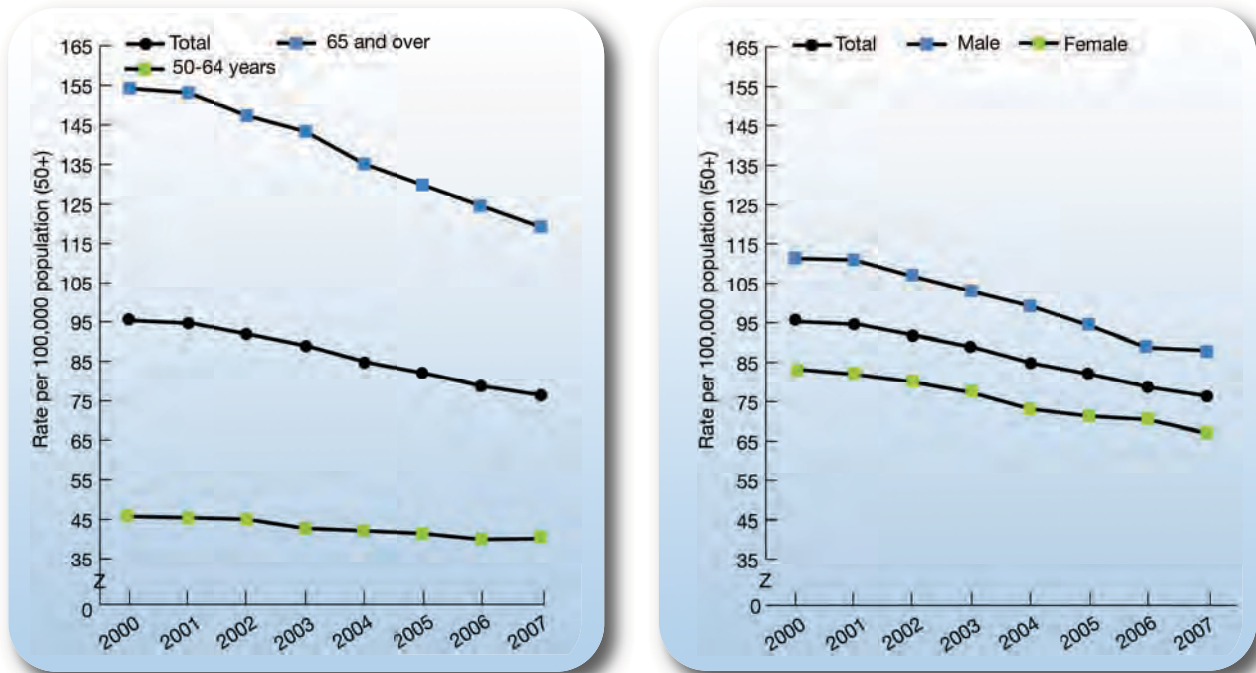
Also, in the NHDR:

- In all years, the percentage of high-income individuals who reported having received colorectal cancer screening was significantly higher than the percentage for poor, low-income, and middle-income individuals.

## Outcome: Advanced Stage Colorectal Cancer

Cancers can be diagnosed at different stages of development. Cancers diagnosed early before spread has occurred are generally more amenable to treatment and cure; cancers diagnosed late with extensive spread often have poor prognoses. The rate of cancer cases diagnosed at advanced stages is a measure of the effectiveness of cancer screening efforts and of adherence to followup care after a positive screening test. Because many cancers often take years to develop, changes in rates of late-stage cancer may lag behind changes in rates of screening.

**Figure 2.2. Colorectal cancer diagnosed at advanced stage (tumors diagnosed at regional or distant stage) per 100,000 population age 50 and over, by age and gender, 2000-2007**



**Source:** National Cancer Institute, Surveillance, Epidemiology, and End Results Program, 2000-2007.

**Denominator:** Adults age 50 and over in the civilian noninstitutionalized population.

**Note:** Age adjusted to the 2000 U.S. standard population. Advanced stage colorectal cancer is defined as local stage with tumor size greater than 2 cm diameter, regional stage or distant stage.

<sup>v</sup> The top 5 States that contributed to the benchmark are Delaware, Maine, Maryland, Massachusetts, and New Hampshire.



# Effectiveness of Care

- Between 2000 and 2007, the overall rate of advanced stage colorectal cancer diagnosis in adults age 50 and over significantly decreased, from 95.3 to 76.3 per 100,000 population (Figure 2.2).
- From 2000 to 2007, the rate of advanced stage colorectal cancer in adults ages 50-64 significantly decreased, from 45.7 to 40.1 per 100,000 population. During the same period, adults age 65 and over also saw a significant decrease, from 154.2 to 119.2 per 100,000 population. In all years, adults age 65 and over had significantly higher rates of advanced stage colorectal cancer than adults ages 50-64.
- From 2000 to 2007, the rate of advanced stage colorectal cancer in males age 50 and over decreased significantly from 111.4 to 88.0. During the same period, rates for females age 50 and over also showed a significant decrease, from 83.2 to 67.0. In all years, males had significantly higher rates of advanced stage colorectal cancer compared with females.

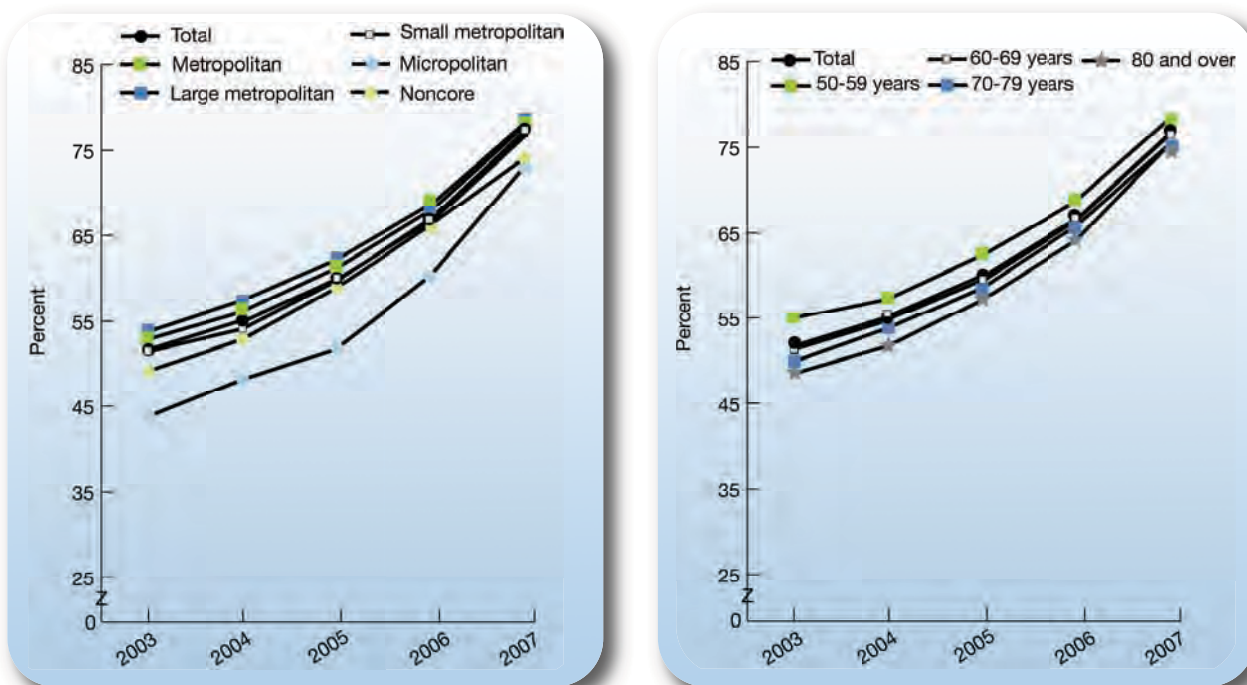
Also, in the NHDR:

- From 2000 to 2007, the rate of advanced stage colorectal cancer was significantly lower for Asians and Pacific Islanders (APIs) and American Indians and Alaska Natives (AI/ANs) than for Whites.

## Treatment: Recommended Care for Colorectal Cancer

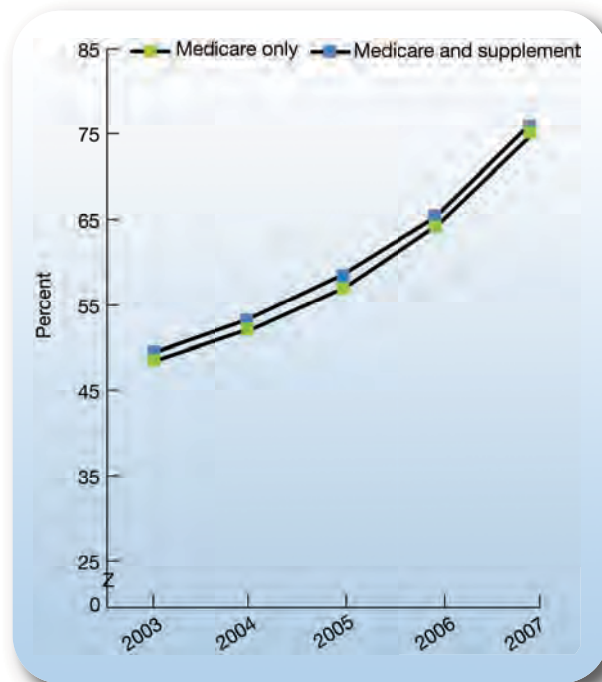
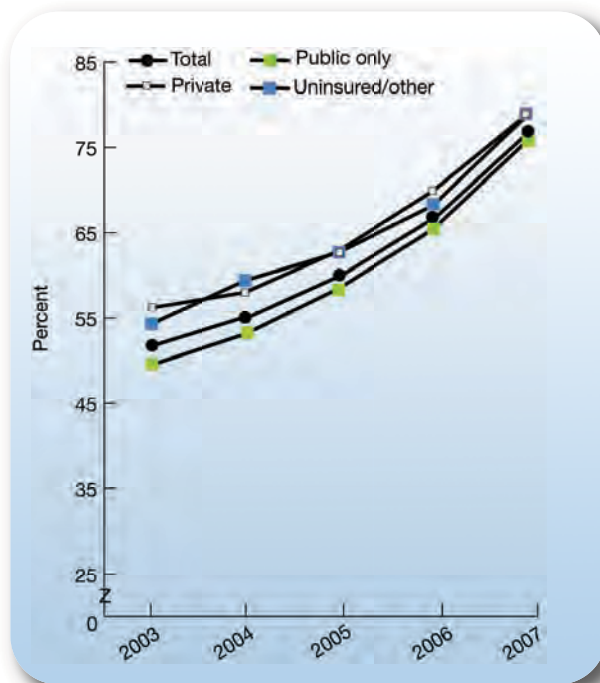
Different diagnostic and treatment options exist for various types of cancer. Some aspects of cancer care are well established as beneficial and are commonly recommended. The appropriateness of recommended care depends on different factors, such as the stage or the extent of the cancer within the body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

**Figure 2.3. Patients who received surgical resection of colon cancer that included at least 12 lymph nodes pathologically examined, by residence location, age, and insurance status, 2003-2007**





# Effectiveness of Care



**Source:** Commission on Cancer, American College of Surgeons and American Cancer Society, National Cancer Data Base, 2003-2007.

**Denominator:** U.S. population age 50 and over.

- The overall percentage of adults diagnosed with colorectal cancer who received recommended care significantly increased, from 51.7% in 2003 to 77.0% in 2007 (Figure 2.3). Significant improvement was observed among all insurance groups during this period.
- From 2003 to 2007, the percentage of colorectal cancer patients who received recommended care significantly increased in all residence locations. The percentage of colorectal cancer patients in large metropolitan areas who received recommended care was significantly higher in all years than that of patients in micropolitan and noncore areas and significantly higher than the percentage of patients in small metropolitan areas in 4 of 5 years.
- Between 2003 and 2007, the percentage of colorectal cancer patients who received recommended care increased significantly for all age groups.
- In all years, patients age 65 and over with Medicare only and with Medicare and supplemental insurance had similar rates of recommended treatment.

Also, in the NHDR:

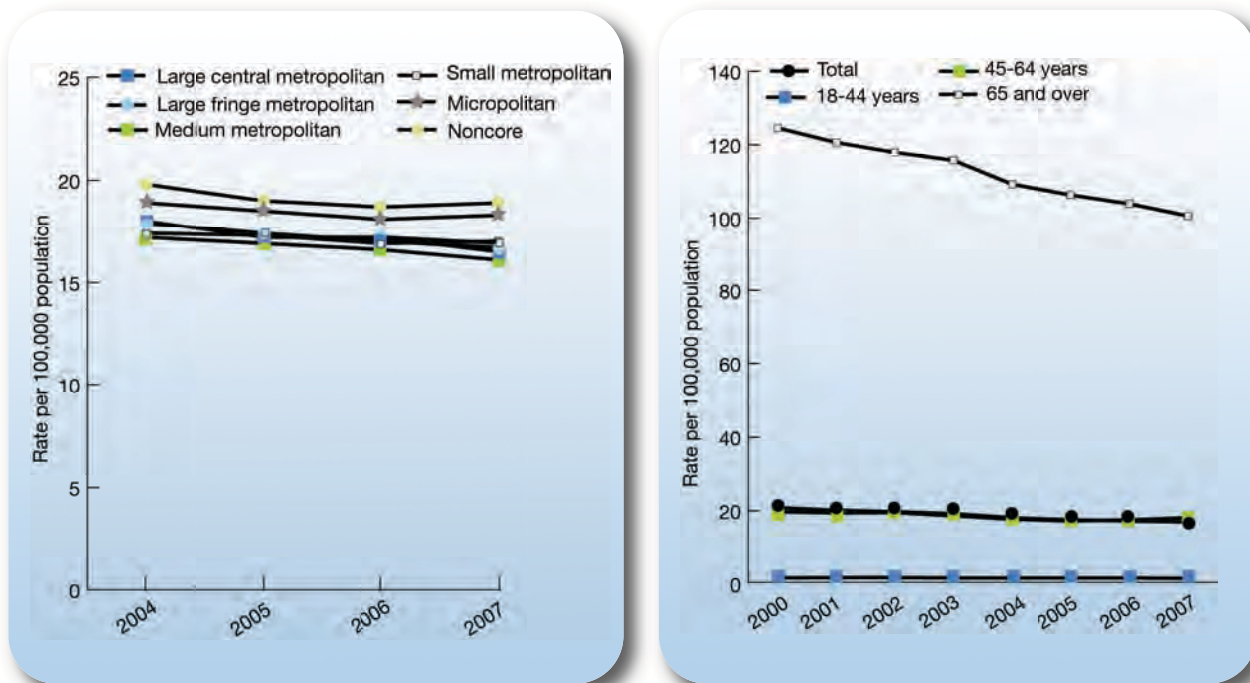
- Between 2003 and 2007, all racial and ethnic groups showed significant improvement in the percentage of patients diagnosed with colorectal cancer who received recommended care.

# Effectiveness of Care

## Outcome: Colorectal Cancer Deaths

The death rate from a disease is a function of many factors, including the causes of the disease; social forces; and the effectiveness of the health care system in providing prevention, treatment, and management of the disease. Colorectal cancer deaths reflect the impact of colorectal cancer screening, diagnosis, and treatment. Mortality is measured as the number of deaths per 100,000 population. Declines in colorectal cancer deaths can be attributed, in part, to improvements in early detection and treatment.

**Figure 2.4. Age-adjusted colorectal cancer deaths per 100,000 population, by residence location, 2004-2007, and age, 2000-2007**



**Source:** Centers for Disease Control and Prevention, National Center for Health Statistics, National Vital Statistics System—Mortality, 2000-2007.

**Denominator:** U.S. population.

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

- Between 2004 and 2007, the rate of colorectal cancer deaths significantly decreased, from 18.0 to 16.9 per 100,000 population (Figure 2.4).
- In all years, residents of noncore and micropolitan areas had significantly higher rates of colorectal cancer deaths compared with residents of large fringe metropolitan areas.
- From 2004 to 2007, the rate of colorectal cancer deaths for adults ages 65 and over significantly decreased, from 109.2 to 100.6 per 100,000 population.

# Effectiveness of Care

## Diabetes

### Importance

#### Mortality

Number of deaths (2007) .....	71,382 <sup>1</sup>
Cause of death rank (2007) .....	7th <sup>1</sup>

#### Prevalence

Total number of people with diabetes (2007).....	23.6 million <sup>7</sup>
Number of people with diagnosed diabetes (2007) .....	17.9 million <sup>7</sup>
Number of people with undiagnosed diabetes (2007) .....	5.7 million <sup>7</sup>

#### Incidence

New cases (age 20 and over, 2007).....	1.6 million <sup>7</sup>
--	--------------------------

#### Cost

Total cost (2007 est.).....	\$174 billion <sup>8</sup>
Direct medical costs (2007 est.) .....	\$116 billion <sup>8</sup>

### Measures

Routine monitoring of blood glucose levels with hemoglobin A1c (HbA1c) tests and dilated eye and foot examinations<sup>vi</sup> have been shown to help prevent or mitigate complications of diabetes, such as diabetic neuropathy, retinopathy, and vascular and kidney disease.<sup>9</sup> With more than half a million discharges in 2006, diabetes is one of the leading causes of hospitalization in the United States.<sup>10</sup> However, with appropriate and timely ambulatory care, it may be possible to prevent many hospitalizations for diabetes and related complications.

The core measure reported in this section examines the extent to which individuals with diabetes receive care needed to prevent complications or slow the disease's progression:

- Receipt of three recommended diabetes services.

In addition, three supporting outcome measures are presented. Two of these measures are included as part of AHRQ's Prevention Quality Indicators (PQIs).<sup>vii</sup> PQIs may be used to estimate rates of potentially avoidable hospitalizations among ambulatory care-sensitive conditions. These are hospitalizations that may have been prevented with high-quality ambulatory care and treatment.

<sup>vi</sup> HbA1c, or glycosylated hemoglobin, is a measure of average levels of glucose in the blood.

<sup>vii</sup> More information on the PQIs is available at: [www.qualityindicators.ahrq.gov/downloads/pqi/word/pqi\\_guide\\_v31.doc](http://www.qualityindicators.ahrq.gov/downloads/pqi/word/pqi_guide_v31.doc).

# Effectiveness of Care

The supporting measures from the PQIs are:

- Hospitalization for short-term diabetes complications (PQI 1).
- Hospitalization for lower extremity amputation (PQI 16).

The final supporting measure also offers insight into the adequacy of diabetes management:

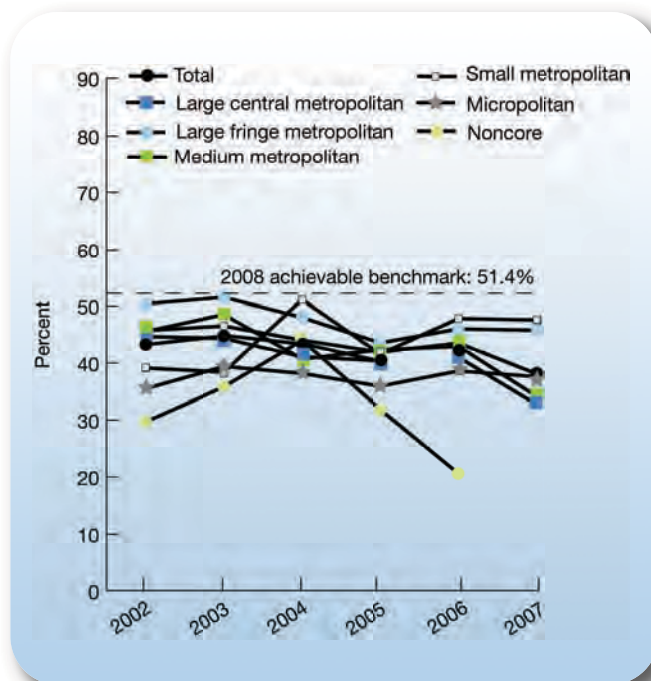
- Control of HbA1c, cholesterol, and blood pressure.

## Findings

### Management: Receipt of Three Recommended Diabetes Services

The NHQR uses a composite measure to track the national rate of receipt of all three recommended annual diabetes interventions: an HbA1c test, an eye examination, and a foot examination. These are basic process measures that provide an assessment of the quality of diabetes management.

**Figure 2.5. Composite measure: Adults age 40 and over with diagnosed diabetes who received three recommended services for diabetes in the calendar year (hemoglobin A1c test, dilated eye examination, and foot examination), by residence location, 2002-2007**



**Source:** Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2002-2007.

**Denominator:** Civilian noninstitutionalized population with diagnosed diabetes, age 40 and over.

**Note:** Data include people with both type 1 and type 2 diabetes. Rates are age adjusted to the 2000 U.S. standard population. Data were statistically unreliable for the noncore population in 2007. Benchmark is derived from the Behavioral Risk Factor Surveillance Survey (BRFSS); see Introduction and Methods for details.

# Effectiveness of Care

- The percentage of adults age 40 and over with diagnosed diabetes who received three recommended services showed a significant decrease, from 43.2% in 2002 to 37.5% in 2007 (Figure 2.5).
- Between 2002 and 2007, residents of large central metropolitan and medium metropolitan areas all showed a significant decrease in the percentage of adults diagnosed with diabetes who received recommended care.
- With the exception of 2004 and 2007, adults age 40 and over living in large fringe metropolitan areas were significantly more likely than those in noncore areas to receive recommended services.
- The 2008 top 4 State achievable benchmark was 51.4%.<sup>viii</sup> At the current overall rate of decrease of 1.2%, there is no indication of progress toward the benchmark. The benchmark was achieved by residents of large fringe metropolitan areas in 2003 but since then, the percentage of residents receiving recommended care has decreased and is therefore moving away from the benchmark. A similar trend is shown for large central and medium metropolitan areas, micropolitan areas, and noncore areas. Small metropolitan areas, with an annual rate of increase of 1.7%, could achieve the benchmark in 2 years.
- In 2007, 88% of adults diagnosed with diabetes had HbA1c measurement in the calendar year, 61% had dilated eye examination, and 66.5% their feet checked. HbA1c measurement and foot examination have significantly decreased since 2002.

Also, in the NHDR:

- In 5 of 6 years, the percentage of adults age 40 and over with diabetes who received recommended services was significantly lower for Hispanics than for non-Hispanic Whites.

## Outcome: Admissions for Short-Term Diabetes Complications

Individuals who do not achieve good control of their diabetes are more prone to short-term complications that can reduce quality of life, increase chances of death, and increase health care costs both directly and indirectly. The acute metabolic complications of diabetes consist of diabetic ketoacidosis (DKA), hyperosmolar nonketotic coma (HNC), lactic acidosis (LA), and hypoglycemia.<sup>11</sup>

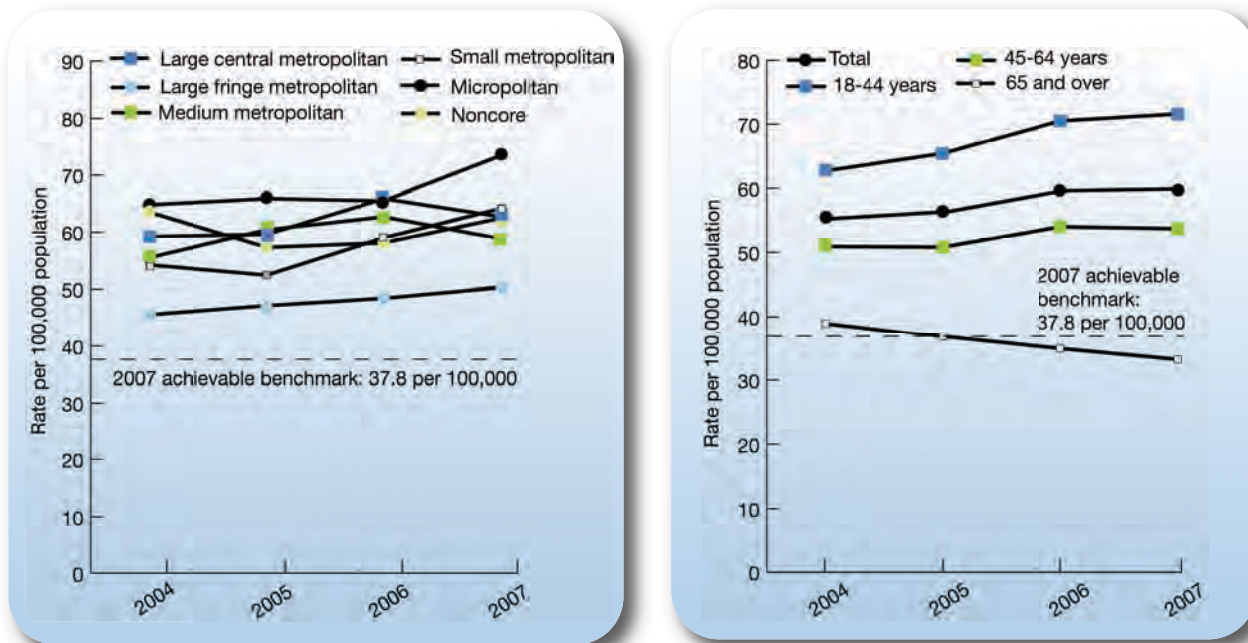
Patients with DKA, HNC, and LA require hospitalization for treatment and therefore result in the use of significant health care resources with increased health care costs. Patients with hypoglycemia often do not require hospitalization but can still incur costs for treatment in an ambulatory setting, as well as loss of productivity. Prevention is an important component in reducing health care costs for these disorders<sup>11</sup> and helping people with diabetes maintain optimal function.

<sup>viii</sup> The top 4 States contributing to the achievable benchmark are Alaska, New Hampshire, Vermont, and the District of Columbia (treated as a State for comparison purposes).



# Effectiveness of Care

**Figure 2.6. Hospital admissions for diabetes with short-term complications per 100,000 population age 18 and over, by residence location and age, 2004-2007**



**Source:** Agency for Healthcare Research and Quality, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample and AHRQ Quality Indicators, version 3.1.

**Denominator:** U.S. resident population age 18 and over.

**Note:** Short-term complications include ketoacidosis, hyperosmolarity, or coma and exclude obstetric admissions and transfers from other institutions.

- In all years, residents of large fringe metropolitan areas had significantly lower hospital admissions for short-term complications than residents of micropolitan areas (Figure 2.6). Residents of large fringe metropolitan areas also had significantly lower hospital admissions than residents of large central metropolitan areas in 3 of 4 years.
- Between 2004 and 2007, the overall rates of admission for adults who experienced short-term complications significantly increased, from 55.2 to 59.9.
- Between 2004 and 2007, adults ages 18-44 had a significant increase in the rates of admission for short-term complications while adults age 65 and over had a significant decrease in admission rates.
- In all years, adults age 65 and over had significantly lower rates of admission for short-term complications than adults ages 18-64.
- The 2008 top 4 State achievable benchmark was 37.8 per 100,000 population.<sup>ix</sup> At the current annual rate of increase of 1.7%, there is no indication of progress toward the benchmark by residents of any location. Adults age 65 and over have already achieved the benchmark but adults ages 18-64 show no progress toward the benchmark.

<sup>ix</sup> The top 4 States that contributed to the achievable benchmark are Hawaii, Nebraska, Utah, and Vermont.



# Effectiveness of Care

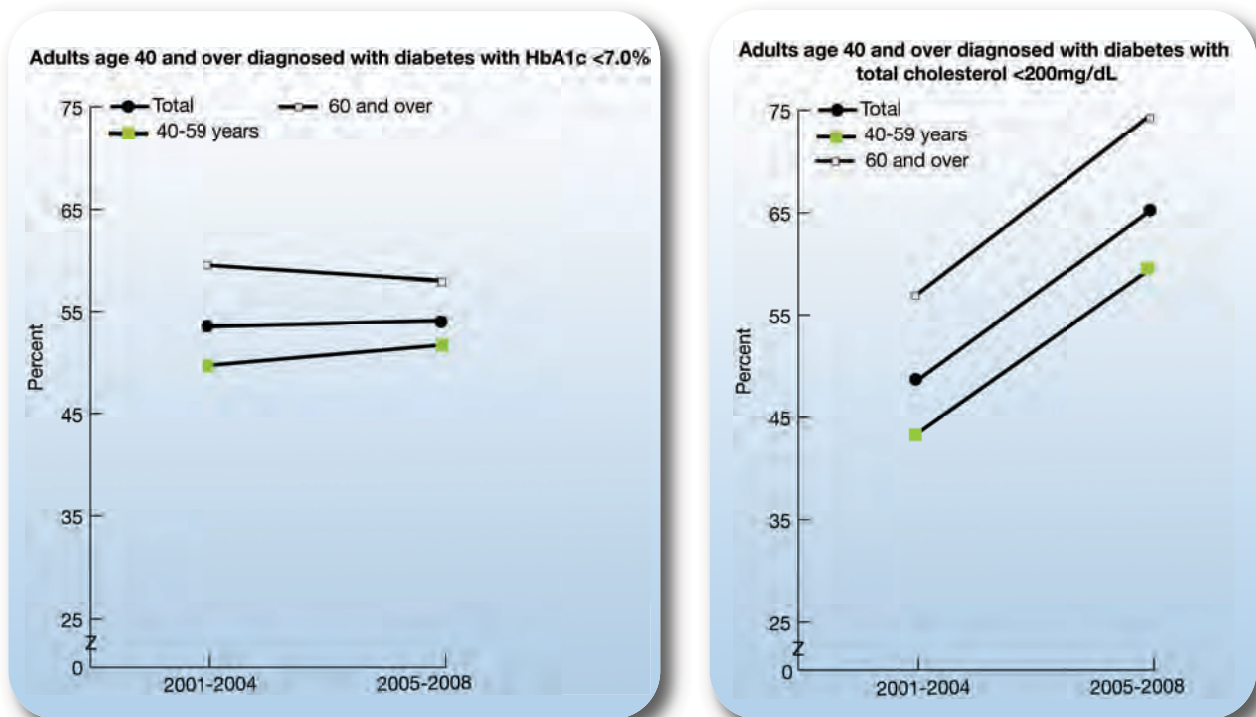
Also, in the NHDR:

- In all years, the rate of hospital admissions for short-term complications was significantly higher for adults living in communities with median household incomes in the first quartile (lowest) than it was for people living in communities with median household incomes in the fourth quartile (highest).
- In all years, the rates of admission were 2.5 times as high for adults living in communities with median household incomes in the first quartile compared with adults living in communities with median household incomes in the fourth quartile.

## Outcome: Controlled Hemoglobin, Cholesterol, and Blood Pressure

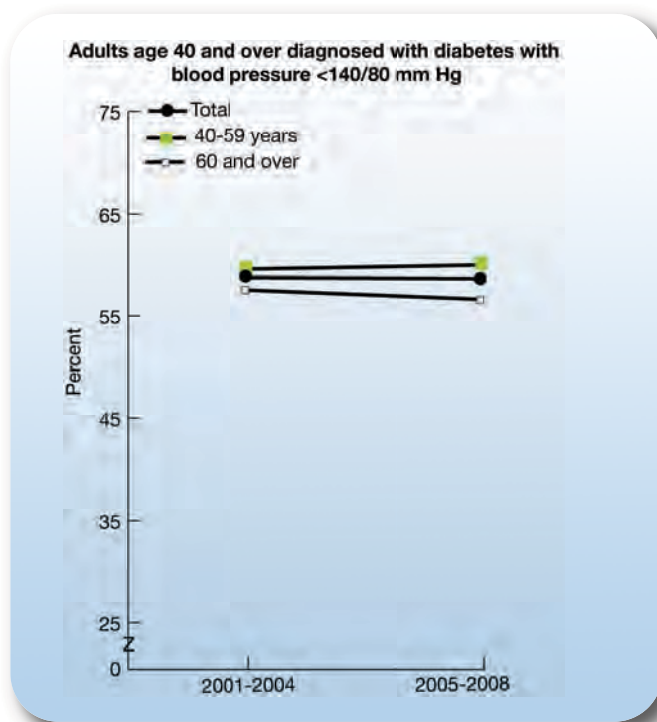
People diagnosed with diabetes often have other cardiovascular risk factors, such as high blood pressure and high cholesterol. Having these conditions in combination with diagnosed diabetes increases the likelihood of complications, such as heart and kidney diseases, blindness, nerve damage, and stroke.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

**Figure 2.7. Adults age 40 and over with diagnosed diabetes with hemoglobin A1c, total cholesterol, and blood pressure under control, by age, 2001-2004 and 2005-2008**



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

# Effectiveness of Care



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

**Denominator:** Civilian noninstitutionalized population with diagnosed diabetes, age 40 and over.

**Note:** Age adjusted to the 2000 standard population using two age groups: 40-59 and 60 and over.

- In 2005-2008, only 54.1% of adults age 40 and over with diabetes had achieved control of their HbA1c level, 65.2% had their cholesterol under control, and 58.6% had their blood pressure under control (Figure 2.7). Although the percentage of adults with controlled HbA1c and blood pressure does not differ markedly from that in the 2001-2004 period, a significant increase in the percentage who had their cholesterol under control was observed over time, from 48.5% in 2001-2004 to 65.2% in 2005-2008.
- In 2001-2004, 56.9% of adults age 60 and over diagnosed with diabetes had cholesterol at optimal levels; this is significantly higher than the 43.3% of adults ages 40-59. In 2005-2008, the percentage of adults age 60 and over diagnosed with diabetes who had optimal cholesterol levels increased to 74.5% while adults ages 40-59 saw an increase to only 59.5%. Adults age 60 and over continued to have significantly higher percentages of people with optimal cholesterol levels compared with adults ages 40-59.

Also, in the NHDR:

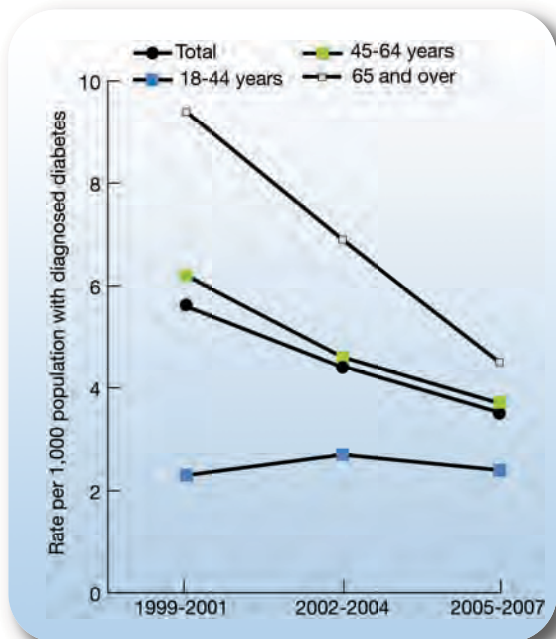
- In 2001-2004, the percentage of non-Hispanic Whites with their blood pressure under optimal control was significantly higher than the percentage of non-Hispanic Blacks. However, in 2005-2008, the percentage of non-Hispanic Whites age 40 years and over who had their blood pressure under optimal control had decreased and the percentage of non-Hispanic Blacks with optimal control had increased. There was no statistically significant difference between the two groups.

## Prevention: Lower Extremity Amputations

People living with diabetes represent more than 60% of nontraumatic lower extremity amputations<sup>12</sup> even though amputations can be avoided through proper care on the part of patients and providers. Hospital admissions for lower extremity amputations for patients with diagnosed diabetes reflect poorly controlled diabetes. Better management of diabetes would prevent the need for lower extremity amputations.

# Effectiveness of Care

**Figure 2.8. Hospital admissions for lower extremity amputations per 1,000 adult patients with diagnosed diabetes, by age, 1999-2007**



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

**Denominator:** Civilian noninstitutionalized population 18 years and over who report they have ever been told they have diabetes.

- From 1999-2001 to 2005-2007, the overall rate of hospital admissions for lower extremity amputations significantly decreased, from 5.6 per 1,000 population to 3.5 per 1,000 population (Figure 2.8).
- From 1999-2001 to 2005-2007, rates significantly decreased for adults ages 45-64, from 6.2 per 1,000 population to 3.7 per 1,000 population. Adults age 65 and over diagnosed with diabetes also had admissions significantly decrease, from 9.4 per 1,000 population to 4.5 per 1,000 population.
- In all years, adults ages 18-44 had significantly lower rates of hospital admissions for lower extremity amputation than the overall population and adults age 45 and over. The rate of admission for adults age 65 and over was more than twice the rate of adults ages 18-44 in the first 2 data years and almost twice the rate in the third data year.

Also, in the NHDR:

- In 2002-2004 and 2005-2007, Blacks had significantly higher rates of hospitalization for lower extremity amputations compared with White adults.
- Males had similarly higher rates of admissions, twice the rate of females.

# Effectiveness of Care

## End Stage Renal Disease

### Importance

#### Mortality

Total end stage renal disease (ESRD) deaths (2007).....87,812<sup>13</sup>

#### Prevalence

Total cases (2007).....514,642<sup>14</sup>

#### Incidence

Number of new cases (2007).....110,996<sup>13</sup>

#### Cost

Total ESRD Medicare program expenditures (2007 est.).....\$23.9 billion<sup>13</sup>

### Measures

The NHQR tracks several measures of ESRD management to assess the quality of care provided to renal dialysis patients. The two core report measures and one supporting measure highlighted here are:

- Adequacy of hemodialysis (core).
- Registration for transplantation (core).
- Use of arteriovenous fistula (AVF) at first outpatient dialysis (supporting).

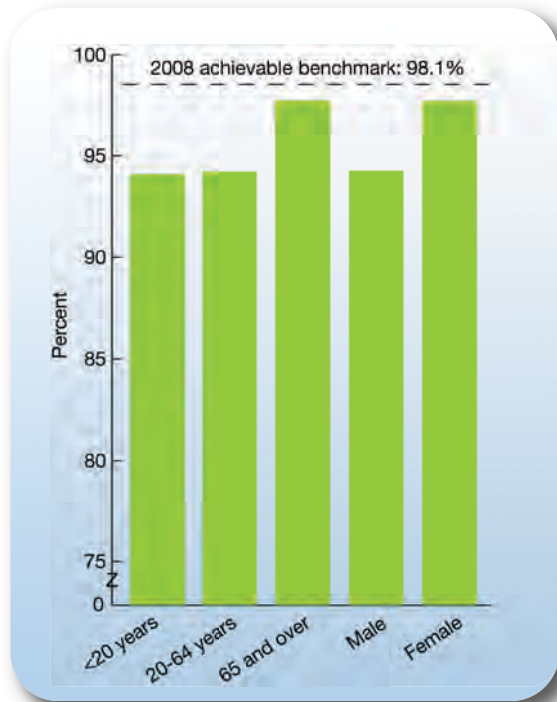
### Findings

#### Outcome: Adequate Hemodialysis

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

# Effectiveness of Care

**Figure 2.9. Adult hemodialysis patients with adequate dialysis (urea reduction ratio 65% or greater), by age and gender, 2008**



**Source:** University of Michigan Kidney Epidemiology and Cost Center, 2009 Dialysis Facility Report.

**Denominator:** End stage renal disease hemodialysis patients age 20 and over.

- In 2008, the overall percentage of adult hemodialysis patients receiving adequate dialysis was 95.8% (data not shown). The percentage of male adult hemodialysis patients receiving adequate dialysis was lower than that of females (94.1% compared with 97.8%; Figure 2.9).
- In addition, the percentage of adult hemodialysis patients receiving adequate dialysis was higher for those age 65 years and over than for those ages 20-64 years (97.7% compared with 94.2%).
- In 2008, the Top 5 State achievable benchmark was 98.1%.<sup>xi</sup> The available data were not sufficient to calculate time to benchmark.

## Management: Registration for Transplantation

Kidney transplantation is a procedure that replaces a failing kidney with a healthy kidney. If a patient is deemed a good candidate for transplant, he or she is placed on the transplant program's waiting list. Dialysis patients wait for transplant centers to match them with the most suitable donor. Registration for transplantation is an initial step toward patients receiving the option of kidney transplantation.

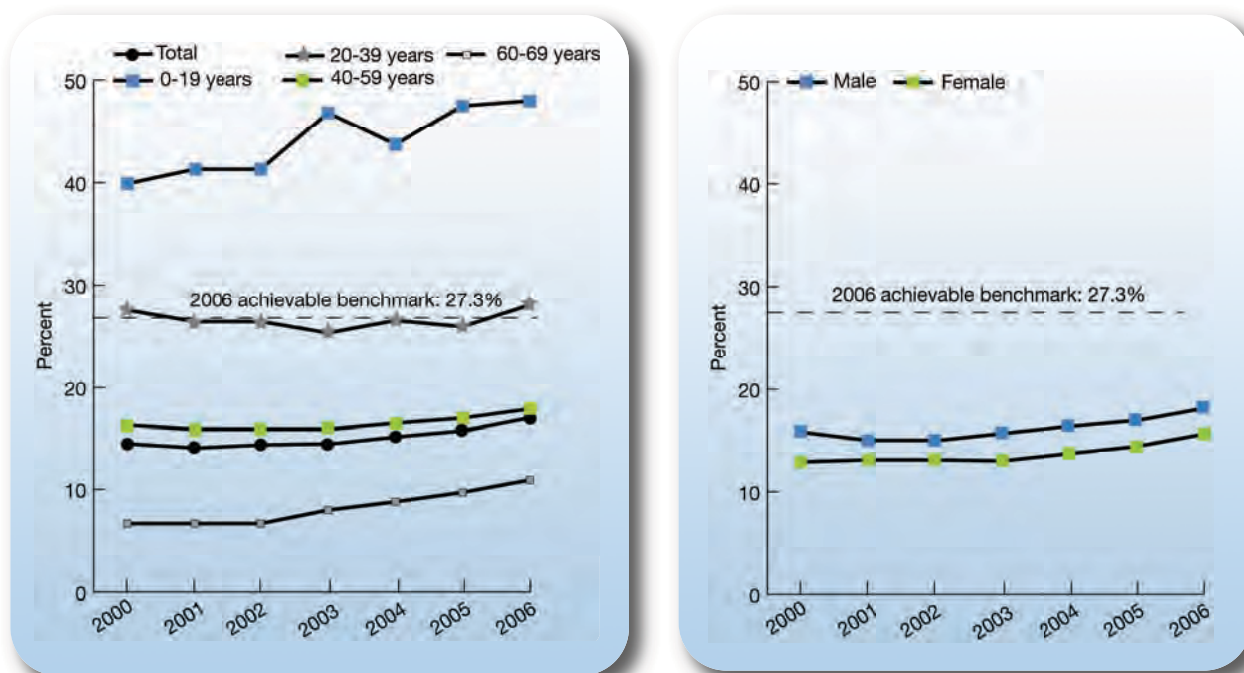
<sup>xi</sup> The top 5 States that contributed to the achievable benchmark are Colorado, Connecticut, Hawaii, Rhode Island, and Texas.



# Effectiveness of Care

Early transplantation that decreases or eliminates the need for dialysis can also lessen the occurrence of acute rejection and patient mortality. In 2006, 70,778 patients were on the Organ Procurement and Transplantation Network’s deceased donor kidney transplant waiting list in the United States. Only 10,212 deceased donor kidney transplants were performed.<sup>15</sup> In 2007, the number of kidney transplants from deceased donors decreased by 1.3%, and kidney transplants from living donors dropped by 6.1%.<sup>16</sup>

**Figure 2.10. Dialysis patients who were registered on a waiting list for transplantation, by age and gender, 2000-2006**



**Source:** National Institute of Diabetes and Digestive and Kidney Diseases, U.S. Renal Data System, 2000-2006.

**Denominator:** End stage renal disease hemodialysis patients and peritoneal dialysis patients under age 70.

- From 2000 to 2006, the percentage of dialysis patients who were registered on a waiting list for transplantation increased from 14.5% to 17.1% (Figure 2.10). Improvements were observed among all age groups except patients ages 20-39.
- In all years, patients ages 20-69 were less likely than patients ages 0-19 to be registered on a waiting list.
- In 2006, females were less likely than males to be registered on a waiting list (15.6% compared to 18.2%).
- The 2006 top 5 State achievable benchmark was 27.3%.<sup>xiii</sup> At the current rate of improvement, the benchmark would not be attained overall for almost 24 years.

<sup>xiii</sup> The top 5 States that contributed to the achievable benchmark are California, Minnesota, New Hampshire, Pennsylvania, and South Dakota.



# Effectiveness of Care

- At their current rates of improvement, male patients could attain the benchmark in about 20 years, whereas female patients could not attain the benchmark for more than 29 years.

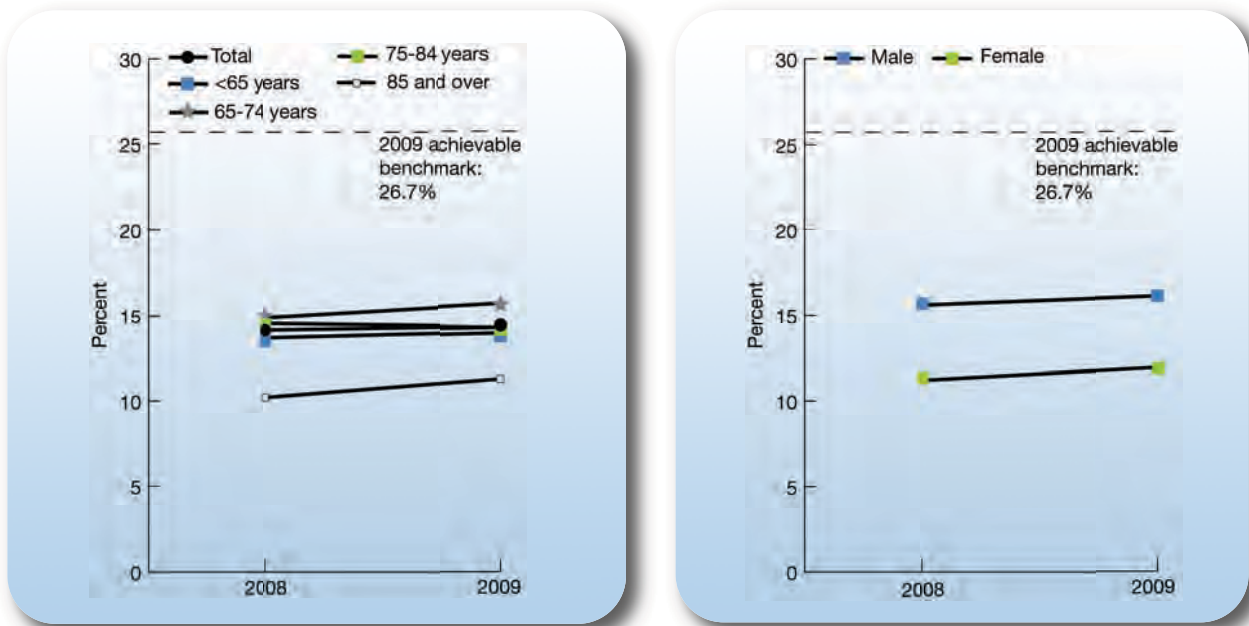
Also, in the NHDR:

- In 2006, Blacks and American Indians and Alaska Natives were less likely to be registered on a waiting list than Whites (10.8% and 9.8%, respectively, compared with 16.3%). However, Asians (27.5%) were more likely to be registered on a waiting list than Whites.

## Management: Use of Arteriovenous Fistula for Vascular Access

For people with ESRD, vascular access is a way to reach the blood vessels so that harmful urea can be removed from the blood. An AVF is the preferred type of access for most hemodialysis patients for three reasons: (1) it provides adequate blood flow for dialysis, (2) it lasts a long time, and (3) it has a low complication rate compared with other methods. Although there is consensus that AVF should be the primary method of vascular access, the incidence rates of AVF have historically been very low. Therefore, the Centers for Medicare & Medicaid Services (CMS) has sought to increase rates of AVF for primary access across the country by forming a nationwide initiative and collaborative effort to increase overall use of AVF. In 2005, this effort, the Fistula First Breakthrough Initiative, set the goal for national prevalence at 66%.

**Figure 2.11. Incident adult hemodialysis patients who used an arteriovenous fistula at first outpatient dialysis, by age and gender, 2008-2009**



**Source:** Centers for Medicare & Medicaid Services, Fistula First Incident AVF Dataset, 2008-2009.

**Denominator:** New end stage renal disease hemodialysis patients.

# Effectiveness of Care

- From 2008 to 2009, the percentage of dialysis patients who used an AVF at first dialysis increased from 13.7% to 14.3% (Figure 2.11). Significant improvements were observed only among the 85 and over age group (10.2% to 11.3%).
- Those ages 65-74 had higher rates of AVF at first dialysis than those younger than 65 (15.7% compared with 14%), but for dialysis patients age 85 years and over, the use of AVF at first dialysis was lower (11.3%).
- In 2009, female dialysis patients had significantly lower rates of AVF at first dialysis than males (12.0% compared with 16.1%).
- The 2009 top 5 State achievable benchmark was 26.7%.<sup>xiii</sup> The available data were insufficient to calculate time to benchmark.

Also, in the NHDR:

- In 2009, a higher percentage of Asians than Whites used AVF at first dialysis, but a lower percentage of Blacks than Whites used AVF at first dialysis (17.6%, 14.7%, and 13.1%, respectively).



<sup>xiii</sup> The top 5 States that contributed to the achievable benchmark are Hawaii, Maine, Montana, New Hampshire, and Oregon.

# Effectiveness of Care

## Heart Disease

### Importance

#### Mortality

Number of deaths (2007).....	616,067 <sup>1</sup>
Cause of death rank (2007).....	1st <sup>1</sup>

#### Prevalence

Number of cases of coronary heart disease (2006).....	17.6 million <sup>4</sup>
Number of cases of heart failure (2006).....	5.8 million <sup>4</sup>
Number of cases of high blood pressure (2006).....	74.5 million <sup>4</sup>
Number of heart attacks (2006).....	8.5 million <sup>17</sup>

#### Incidence

Number of new cases of heart failure (2004).....	550,000 <sup>18</sup>
--	-----------------------

#### Cost

Total cost of cardiovascular disease (2010 est.).....	\$503.2 billion <sup>4</sup>
Total cost of heart failure (2010 est.).....	\$39.2 billion <sup>17</sup>
Direct costs of cardiovascular disease (2010 est.).....	\$324.1 billion <sup>4</sup>
Cost-effectiveness of hypertension screening.....	\$14,000-\$35,000/QALY <sup>5</sup>

### Measures

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

- Receipt of angiotensin-converting enzyme (ACE) inhibitor or angiotensin receptor blocker (ARB) for heart attack.
- Inpatient deaths following heart attack.
- Receipt of recommended care for heart failure.

Several measures related to heart disease are also presented in other chapters of this report. Timeliness of cardiac reperfusion for heart attack patients is tracked in Chapter 4, Timeliness, and receipt of complete written discharge instructions by patients with heart failure is tracked in Chapter 6, Care Coordination.

# Effectiveness of Care

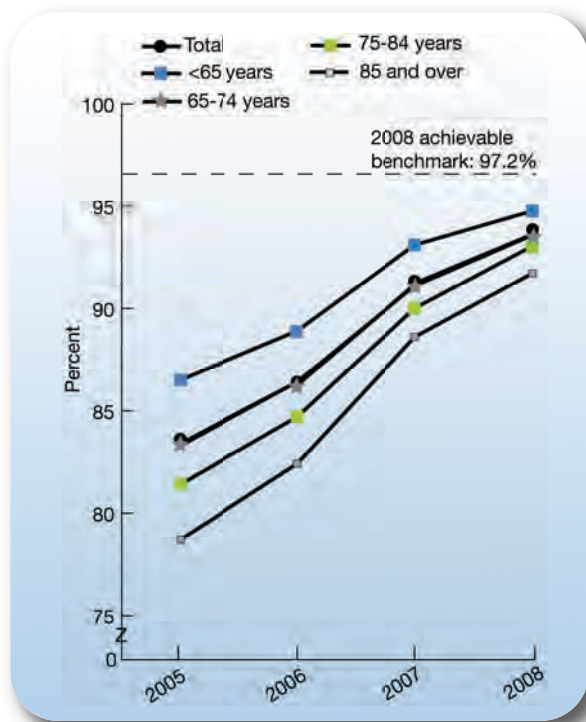
## Findings

### Treatment: Receipt of Angiotensin-Converting Enzyme Inhibitor or Angiotensin Receptor Blocker for Heart Attack

Heart attack, or acute myocardial infarction, is a common life-threatening condition that requires rapid recognition and efficient treatment in a hospital to reduce the risk of serious heart damage and death. Measuring processes of heart attack care can provide information about whether a patient received specific needed services, but these processes make up a very small proportion of all the care that a heart attack patient needs. Measuring outcomes of heart attack care, such as mortality, can provide a more global assessment of all the care a patient receives and usually is the aspect of quality that matters most to patients.

Significant improvements in a number of measures of quality of care for heart attack have occurred in recent years. Four measures that have been tracked in past NHQRs (administration of aspirin within 24 hours and at discharge, administration of beta blocker at discharge, and counseling to quit smoking) have attained overall performance levels exceeding 95%. These measures were included in the composite measure of care for heart attack in past NHQRs. However, the success of these measures creates a ceiling effect that limits the report's ability to track improvement over time. Moreover, administration of beta blocker within 24 hours as recommended practice has been discontinued. Hence, this NHQR focuses on one measure of heart attack care, ACE inhibitor or ARB treatment among patients with left ventricular systolic dysfunction.

**Figure 2.12. Hospital patients with heart attack and left ventricular systolic dysfunction who received angiotensin-converting enzyme inhibitor or angiotensin receptor blocker, by age, 2005-2008**



**Source:** Centers for Medicare & Medicaid Services, Medicare Quality Improvement Organization Program, 2005-2008.

**Denominator:** Patients hospitalized with a principal diagnosis of acute myocardial infarction and left ventricular systolic dysfunction.

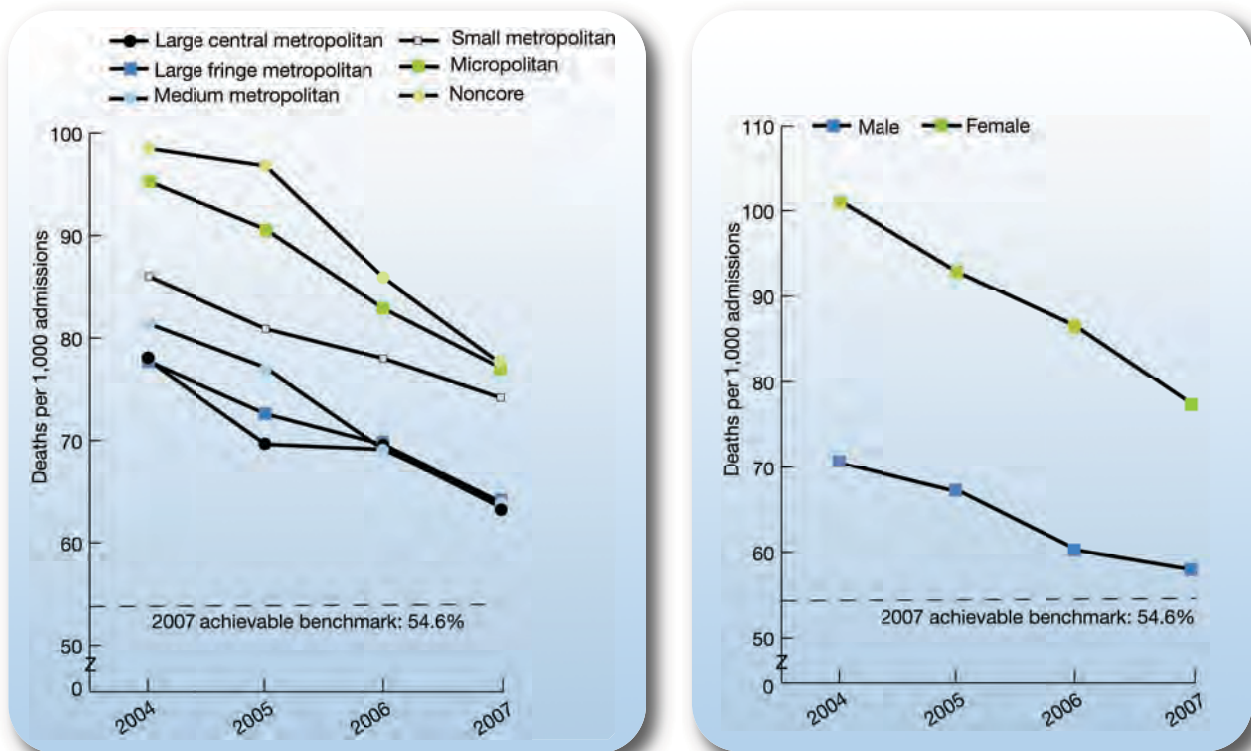
# Effectiveness of Care

- From 2005 to 2008, the percentage of heart attack patients with left ventricular systolic dysfunction who received an ACE inhibitor or ARB increased from 83.4% to 93.7% (Figure 2.12). Improvements were observed among all age groups during the same period.
- The 2008 top 5 State achievable benchmark was 97.2%.<sup>xiv</sup> At the current rate, the 2008 achievable benchmark could be achieved in 1 year. At their current rates of improvement, the achievable benchmark could be reached by all age groups in 1 year. Additionally, all racial and ethnic groups could reach the benchmark in about 1 year, with the exception of AI/ANs, who would reach the benchmark in a little over a year and a half.

## Outcome: Inpatient Deaths Following Heart Attack

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

**Figure 2.13. Deaths per 1,000 adult hospital admissions with heart attack, by geographic location and gender, 2004-2007**



**Source:** Agency for Healthcare Research and Quality, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2004-2007.

**Denominator:** Adults age 18 and over admitted to a non-Federal community hospital in the United States with acute myocardial infarction as principal discharge diagnosis.

**Note:** Rates are adjusted by age, gender, age-gender interactions, and all payer refined-diagnosis related group scoring of risk of mortality.

<sup>xiv</sup> The top 5 States that contributed to the achievable benchmark are Alaska, Minnesota, New Hampshire, North Dakota, and Oregon.



# Effectiveness of Care

- From 2004 to 2007, the overall inpatient mortality rate decreased significantly overall and for each geographic location and gender group (Figure 2.13).
- In 2007, the overall rate of inpatient mortality was 67.3 per 1,000 admissions for heart attack (data not shown). Small metropolitan, micropolitan, and noncore groups had higher rates of inpatient heart attack mortality than large fringe metropolitan areas.
- Also in 2007, females had higher rates of inpatient heart attack mortality than males.
- The 2007 top 4 State achievable benchmark for inpatient heart attack mortality was 54.6 per 1,000 admissions.<sup>xv</sup> At the current rate, the achievable benchmark could be attained in about 2.5 years. Males could attain the benchmark in less than 1 year; however, females could not attain the benchmark for almost 3 years.
- Although most geographic areas could attain the benchmark in 1 to 2 years, small metropolitan areas, micropolitan, and noncore areas could not attain the benchmark until later (about 5 years, 3.6 years, and 3 years, respectively).

Also, in the NHDR:

- At their current rates of improvement, Blacks could attain the achievable benchmark in less than 1 year, but Asians could not attain the benchmark for more than 6 years.

## Treatment: Receipt of Recommended Care for Heart Failure

The NHQR tracks the national percentages of receipt of the following services:

- Recommended test for heart functioning (heart failure patients having evaluation of left ventricular ejection fraction).
- Recommended medication treatment (patients with left ventricular systolic dysfunction prescribed ACE inhibitor or ARB at discharge).

In addition, an overall composite measure describes the percentage of all episodes in which heart failure patients receive recommended care.

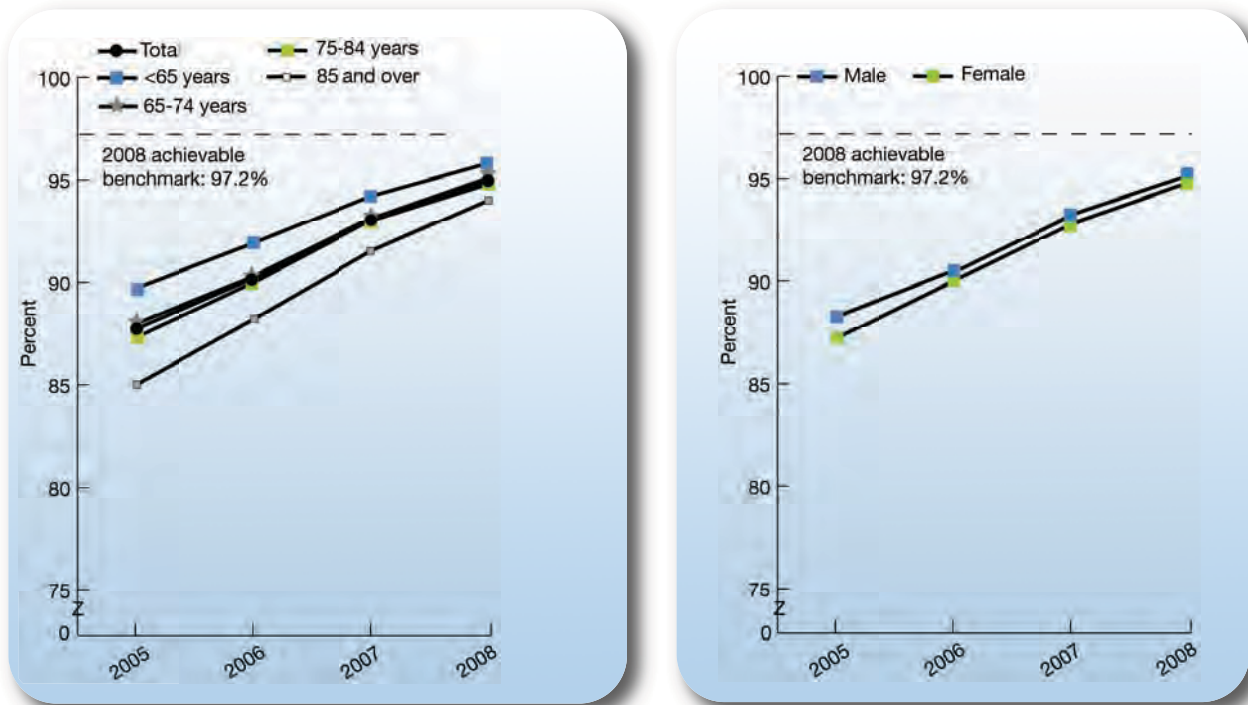
---

<sup>xv</sup> The top 4 States that contributed to the achievable benchmark are Arizona, Florida, Maryland, and Michigan.



# Effectiveness of Care

**Figure 2.14. Hospital patients with heart failure who received recommended hospital care: Overall composite, by age and gender, 2005-2008**



**Source:** Centers for Medicare & Medicaid Services, Medicare Quality Improvement Organization Program, 2005-2008.

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

- From 2005 to 2008, the overall percentage of patients with heart failure who received recommended care increased from 87.7% to 95% (Figure 2.14). The percentage also increased for those age 85 years and over (from 85% to 94%).
- During the same period, the gap decreased between the best performing age group (those under age 65) and the worst performing age group (those age 85 and over).
- The 2008 top 5 State achievable benchmark for patients with heart failure who received recommended hospital care was 97.2%.<sup>xvi</sup> At the current rate, the achievable benchmark could be attained in less than 1 year.
- At their current rates of improvement, all age and gender groups could attain the benchmark in about 1 year.

Also, in the NHDR:

- From 2005 to 2008, the percentage of Asian patients who received recommended care for heart failure increased (from 86.6% to 96.6%).
- Although the other racial and ethnic groups could attain the achievable benchmark in less than 1 year, AI/ANs and Hispanics could not attain the benchmark until later (about 3 years and 1.5 years, respectively).

<sup>xvi</sup> The top 5 States that contributed to the achievable benchmark are Connecticut, Maine, New Hampshire, New Jersey, and South Carolina.

# Effectiveness of Care

## HIV and AIDS

### Importance

#### Mortality

Number of deaths of people with AIDS (2007).....18,089<sup>19</sup>

#### Prevalence

Number of people living with HIV infection.....599,819<sup>19</sup>

Number of people living with AIDS (2007).....470,902<sup>19</sup>

#### Incidence

Number of new HIV infections (2008).....42,439<sup>19</sup>

Number of new AIDS cases (2008).....37,991<sup>19</sup>

#### Cost

Federal spending on HIV/AIDS care, cash and housing assistance, and prevention and research (fiscal year 2011 est.).....\$20.5 billion<sup>20</sup>

HIV is a virus that kills or damages cells of the body's immune system. AIDS is the most advanced stage of HIV infection. HIV is spread through unprotected sex with an infected person, by sharing drug needles, or through contact with the blood of an infected person. Also, women with HIV can transmit it to their babies during pregnancy, childbirth, or breastfeeding.

The impact of HIV infection and AIDS is disproportionately higher for racial and ethnic minorities and people of lower income and education levels. Although access to care has improved, research shows that Blacks, Hispanics, women, and uninsured people with HIV remain less likely to have access to care and less likely to have optimal patterns of care.<sup>21</sup>

According to the Centers for Disease Control and Prevention, HIV and AIDS disproportionately affect African Americans in the United States. In 2008, African Americans accounted for 52% of all diagnoses of HIV infection and had a rate of 73.7 per 100,000 population compared with 8.2 per 100,000 for Whites.<sup>22</sup> The spread of HIV is linked to complex social and economic factors, including poverty, concentration of the virus in specific geographic areas and smaller sexual networks, sexually transmitted co-infections, stigma (negative attitudes, beliefs, and actions directed at people living with HIV/AIDS or directed at people who engage in behaviors that might put them at risk for HIV), and injection and noninjection drug use and associated behaviors.<sup>23</sup>

The HIV/AIDS epidemic is also a serious threat to the Hispanic community. Hispanics accounted for 15% of the population but had an estimated 17% of the new HIV infections in 2006, which was 2.5 times the rate of Whites.<sup>24</sup> In addition to being seriously affected by HIV, Hispanics continue to face challenges in accessing

# Effectiveness of Care

health care, preventive services, and HIV treatment. Undocumented Hispanics face an even greater challenge in accessing care and information regarding HIV and AIDS, but data are limited on HIV infection rates of undocumented immigrants.<sup>25</sup> In 2006, HIV/AIDS was the fourth leading cause of death among Hispanic men and women ages 35–44.<sup>26</sup> Having Medicaid and a usual source of care decreased the likelihood of delaying care for HIV, but research shows that delay in care is still greater for Hispanics and African Americans.<sup>27</sup>

The White House Office of National AIDS Policy launched the National HIV/AIDS Strategy (NHAS) in July 2010. The NHAS is a comprehensive plan focused on: (1) reducing the number of people who become infected with HIV, (2) increasing access to care and optimizing health outcomes for people living with HIV, and (3) reducing HIV-related health disparities. The plan will serve as a roadmap for policymakers, partners in prevention, and the public on steps the United States must take to lower HIV incidence, get people living with HIV into care, and reduce HIV-related health disparities.

## Measures

This year, five supporting measures are presented on the prevention of opportunistic infections in HIV and AIDS patients and one on HIV infection deaths:

- Eligible patients receiving prophylaxis for *Pneumocystis pneumonia* (PCP).
- Eligible patients receiving prophylaxis for *Mycobacterium avium* complex (MAC).
- Adult HIV patients who had at least two outpatient visits during the year.
- Adult HIV patients who received two or more CD4 tests during the year.
- Adult HIV patients who received highly active antiretroviral therapy (HAART).

## Findings

### Management: HIV Patients Receiving Care

Management of chronic HIV disease includes outpatient and inpatient services. Without adequate treatment, as HIV disease progresses, CD4 cell counts fall and patients become increasingly susceptible to opportunistic infections.

HIV/AIDS core clinical performance measures are indicators used to monitor the quality of care provided to adults and adolescents living with HIV. Based on the set of quality measures developed by the HIV/AIDS Bureau of the Health Resources and Services Administration, performance can be measured for various HIV prevention and treatment services. Services needed by patients with HIV include:

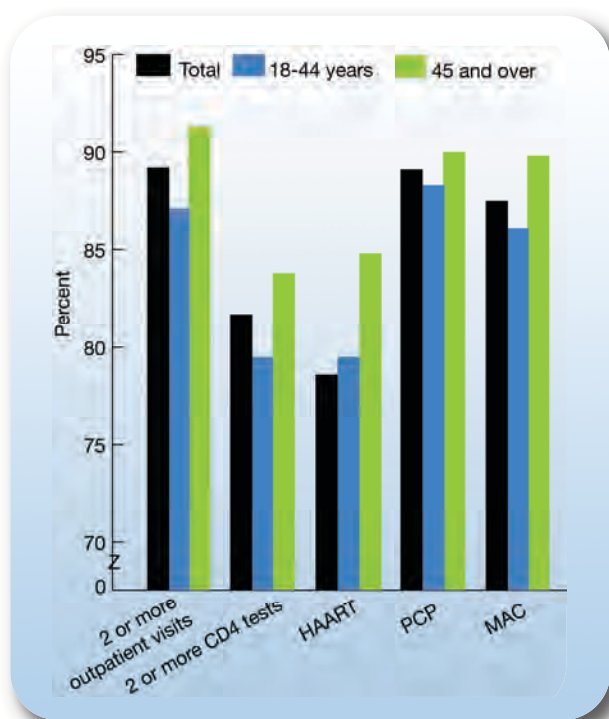
- Two or more CD4 T-cell counts performed in the measurement year.
- HAART for patients with AIDS.
- Two or more medical visits in an HIV care setting in the measurement year.<sup>28</sup>
- PCP prophylaxis for patients with CD4 T-cell count below 200.

# Effectiveness of Care

Currently, national data on HIV care are not routinely collected. HIV measures tracked in the NHQR and NHDR are from the HIV Research Network, which consists of 18 medical practices across the United States that treat large numbers of patients living with HIV. Data from the voluntary HIV Research Network are not nationally representative of the level of care received by all Americans living with HIV. HIV Network data represent only patients who are actually receiving care (about 14,000 HIV patients per year) and do not represent patients who do not receive care. Furthermore, data shown below are not representative of the HIV Research Network as a whole because they represent only a subset of network sites that have the best data.

Below are data from the HIV Research Network that capture four of the HRSA quality measures. In addition, when CD4 cell counts fall below 50, medicine to prevent development of disseminated MAC infection is routinely recommended, and we track this measure as well.<sup>29</sup>

**Figure 2.15. Adult patients with HIV who received care, by age, 2007**



**Key:** HAART = highly active antiretroviral therapy; PCP = *Pneumocystis pneumonia*; MAC = *Mycobacterium avium* complex.

**Source:** Agency for Healthcare Research and Quality, HIV Research Network, 2007.

**Note:** For HAART measure, adult HIV patients had to be enrolled in an HIV network clinic and receive at least one CD4 test and have at least one outpatient visit in addition to having at least one CD4 test result of 350 or less.

- Overall, in 2007, about 89.2% of patients with HIV had two or more outpatient visits during the year, and 81.7% of patients with HIV had two or more CD4 tests during the year. In addition, 78.6% of HIV patients in care received HAART, 89.1% of HIV patients with CD4 count less than 200 received PCP prophylaxis, and 87.5% of HIV patients with CD4 count less than 200 received MAC prophylaxis (Figure 2.15).
- Adult HIV patients age 45 and over were more likely to receive recommended care than HIV patients ages 18-44.

# Effectiveness of Care

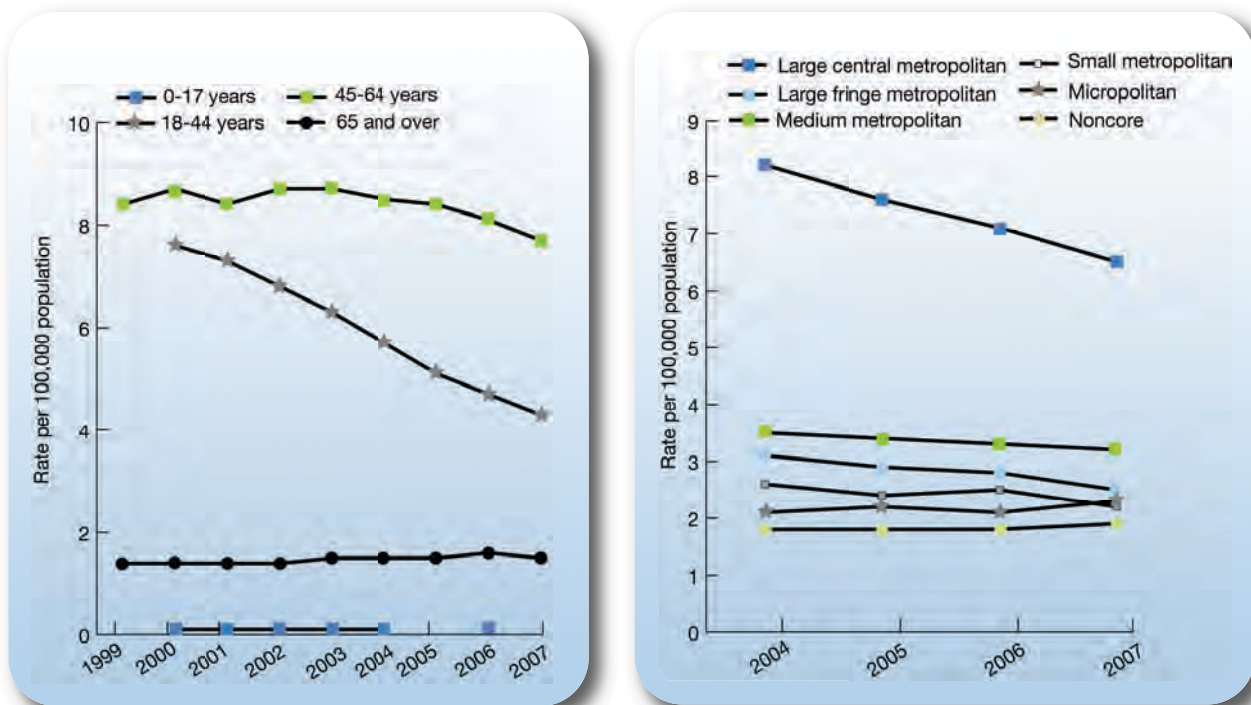
Also, in the NHDR:

- Black patients with HIV were less likely than White patients to receive the minimum care for HIV, except in the receipt of MAC and PCP prophylaxis.
- Female patients with HIV were more likely to have had two or more outpatient visits than male patients but were less likely to receive HAART and MAC prophylaxis.

## Outcome: Deaths of People With HIV Infection

Improved management of HIV infection has contributed to declines in the number of new AIDS cases in the United States since the 1990s.<sup>30</sup> HIV infection deaths reflect a number of factors, including underlying rates of HIV risk behaviors, prevention of HIV transmission, early detection and treatment of HIV disease, and management of AIDS and its complications.

**Figure 2.16. HIV infection deaths per 100,000 population, by age, 1999-2007, and residence location, 2004-2007**



**Source:** Centers for Disease Control and Prevention, National Center for Health Statistics, National Vital Statistics System—Mortality, 1999-2007.

**Denominator:** Civilian noninstitutionalized population.

**Note:** Rates are age adjusted to the 2000 standard population, except for age group data. Data for county residence location were not available for years 1999-2003. Data did not meet criteria for statistical reliability, data quality, or confidentiality for ages 0-17 in 1999 and 2005, and for ages 18-44 in 1999.



# Effectiveness of Care

- Overall, from 1999 to 2007, the rate of HIV infection deaths decreased from 5.3 per 100,000 population to 3.7 per 100,000 population (data not shown).
- From 1999 to 2007, the rate of HIV infection deaths decreased for adults ages 45-64 (from 8.4 per 100,000 population to 7.7 per 100,000 population) but was still highest among all age groups (7.7 compared with 4.3 for ages 18-44 and 1.5 for age 65 and over; Figure 2.16).
- In 2007, the rates of HIV infection deaths were highest for residents in large central metropolitan areas and lowest in noncore areas (6.5 per 100,000 population and 1.9 per 100,000 population, respectively).

Also in the NHDR:

- The HIV infection death rate decreased for Blacks but remains significantly higher than the rate for Whites.
- The HIV infection death rate decreased for Hispanics (from 6.9 per 100,000 to 4.1 per 100,000) but remains more than twice as high as the rate for non-Hispanic Whites.
- In 2007, the HIV infection death rate for males was more than twice that of females.





# Effectiveness of Care

## Maternal and Child Health

### Importance

#### Mortality

Number of maternal deaths (2007) .....	548 <sup>1</sup>
Number of infant deaths (2007) .....	29,138 <sup>1</sup>

#### Demographics

Number of children <sup>xvii</sup> (2007) .....	73,590,243 <sup>31</sup>
Number of babies born in United States (2007) .....	4,316,233 <sup>32</sup>

#### Cost

Total cost of health care for children (2002 est.) .....	\$79 billion <sup>33</sup>
Cost-effectiveness of vision screening for children .....	\$0-\$14,000/QALY <sup>5</sup>
Cost-effectiveness of childhood immunization series <sup>xviii</sup> .....	Cost saving <sup>5</sup>

### Measures

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

- Receipt of recommended immunizations by young children.
- Vision checks for children.
- Counseling of children or parents about physical activity.
- Counseling of children or parents about healthy eating.

In addition, two supporting measures are presented:

- Obstetric trauma.
- Weight monitoring of overweight children.

<sup>xvii</sup> In this report, children are defined as individuals under age 18.

<sup>xviii</sup> The childhood immunization series includes vaccinations for diphtheria-tetanus-pertussis, measles-mumps-rubella, inactivated polio virus, *Haemophilus influenzae* type B, hepatitis B, and varicella. “Cost saving” indicates that childhood immunizations are one of very few services that save more money than they cost.

# Effectiveness of Care

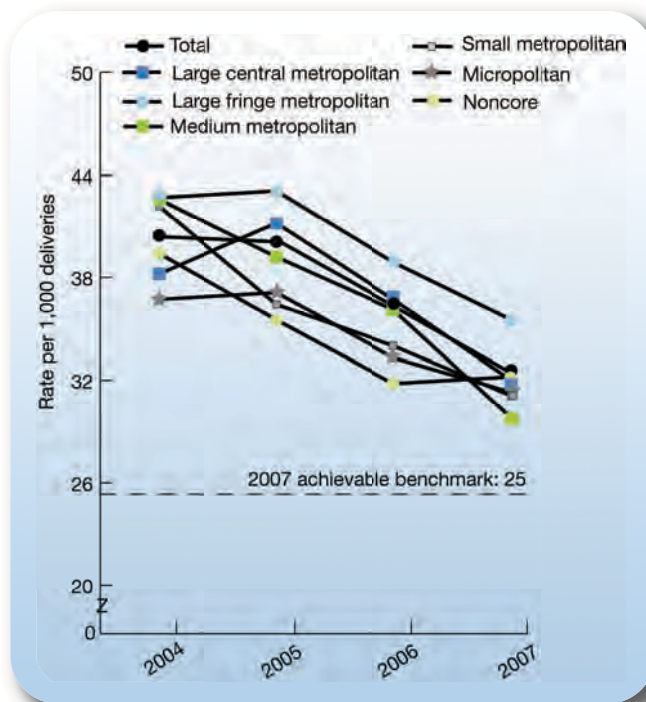
## Findings

### Outcome: Obstetric Trauma

Childbirth and reproductive care are the most common reasons for women of childbearing age to use health care services. With nearly 12,000 births each day in the United States,<sup>32</sup> childbirth is the most common reason for hospital admission.

Obstetric trauma involving a severe tear to the vagina or surrounding tissues during delivery is a common complication of childbirth. The higher risk of severe perineal laceration may be related to the degree of fetal-maternal size disproportion. API women, with the smallest body size, are most likely to experience obstetric trauma.<sup>34</sup> In addition, although any delivery can result in trauma, existing evidence shows that severe perineal trauma can be reduced by restricted use of episiotomy and forceps.<sup>35</sup>

**Figure 2.17. Obstetric trauma with 3rd or 4th degree laceration per 1,000 vaginal deliveries without instrument assistance, by urban-rural location, 2004-2007**



**Source:** Agency for Healthcare Research and Quality, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2004-2007.

**Denominator:** All patients hospitalized for vaginal delivery without indication of instrument assistance.

**Note:** Rates are adjusted by age and comorbidities.

# Effectiveness of Care

- From 2004 to 2007, rates of obstetric trauma with 3rd or 4th degree laceration decreased from 40 to 32 per 1,000 vaginal deliveries without instrument assistance (Figure 2.17).
- Declines were observed in all urban-rural locations.
- In most years, residents of small metropolitan, micropolitan, and noncore areas had lower rates of obstetric trauma than residents of large fringe metropolitan areas.
- The 2007 top 3 State achievable benchmark was 25 per 1,000 deliveries.<sup>xix</sup> At the current 8% annual rate of decrease, this benchmark could be attained overall and in most urban-rural locations in about 3 years. Residents of large fringe metropolitan areas would need about 4 years to attain the benchmark.

Also, in the NHDR:

- In all years, Blacks and Hispanics had lower rates than Whites and residents of the lower two area income quartiles had lower rates than residents of the highest area income quartile.
- In all years, APIs had higher rates than Whites.
- The achievable benchmark could be attained by most racial/ethnic and income groups in about 3 years. Whites and residents of the highest area income quartile would take about 4 years, and APIs would take more than 23 years.

## Prevention: Receipt of Recommended Immunizations by Young Children

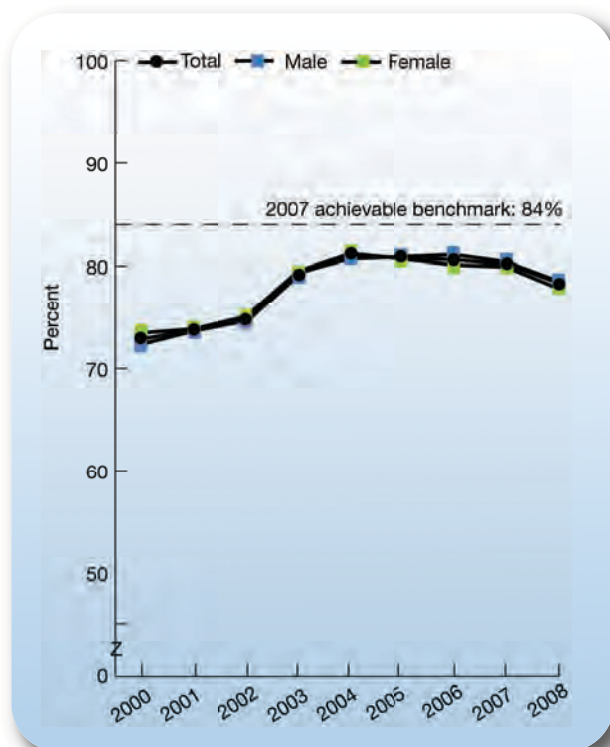
Immunizations are important in reducing mortality and morbidity. They protect recipients from illness and disability and protect others in the community who cannot be vaccinated. In 2008, recommended vaccines for children that should have been completed by ages 19-35 months included four doses of diphtheria-tetanus-pertussis vaccine, three doses of polio vaccine, one dose of measles-mumps-rubella vaccine, three doses of *Haemophilus influenzae* type B vaccine, and three doses of hepatitis B vaccine. These vaccines constitute the 4:3:1:3:3 vaccine series tracked in Healthy People 2010. This series does not include varicella vaccine or vaccines added to the recommended schedule after 1998.

---

<sup>xix</sup> The 3 top States contributing to the achievable benchmark are Massachusetts, Utah, and Wyoming.

# Effectiveness of Care

**Figure 2.18. Composite measure: Children ages 19-35 months who received the 4:3:1:3:3 vaccine series, by gender, 2000-2008**



**Source:** Centers for Disease Control and Prevention, National Center for Health Statistics and National Center for Immunization and Respiratory Diseases, National Immunization Survey, 2000-2008.

**Denominator:** U.S. civilian noninstitutionalized population ages 19-35 months.

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

- From 2000 to 2004, the percentage of children ages 19-35 months who received the 4:3:1:3:3 vaccine series increased from 72.8% to 80.9% (Figure 2.18). From 2004 to 2008, the percentage of children with these vaccines fell to 78.2%.
- This rise and fall was observed among both boys and girls.
- The 2008 top 5 State achievable benchmark was 84%.<sup>xx</sup> Since 2004, the overall rate and rates for boys and girls have been moving away from this benchmark.

Also in the NHDR:

- A pattern of rising and then falling rates was observed among all racial, ethnic, and income groups, although the peak year and statistical significance varied.
- In almost all years, Black children were less likely than White children, and poor, low-income, and middle-income children were less likely than high-income children to receive the 4:3:1:3:3 vaccine series.

<sup>xx</sup> The top 5 States that contributed to the achievable benchmark are Louisiana, Massachusetts, New Hampshire, Tennessee, and Wisconsin.

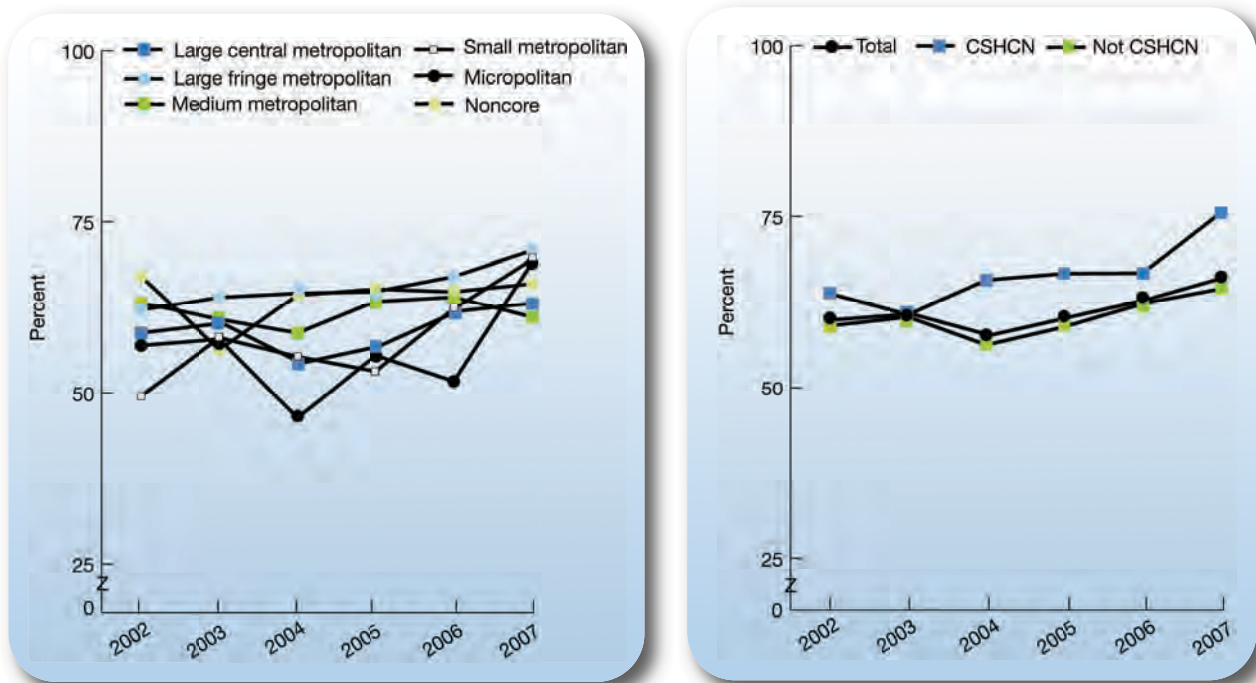
# Effectiveness of Care

- From 2002 to 2006, Hispanic children were less likely than non-Hispanic White children to receive these vaccines. In 2007, rates were comparable, and in 2008, Hispanic children had achieved a higher rate.
- All racial, ethnic, and income groups are moving away from the achievable benchmark, although rates among Asians and high-income children are still above the benchmark.

## Prevention: Children's Vision Care

Vision checks for children may detect problems of which children and their parents were previously unaware. Early detection also improves the chances that corrective treatments will be successful.

**Figure 2.19. Children ages 3-6 who ever had their vision checked by a health provider, by urban-rural location and special health care needs, 2002-2007**



**Key:** CSHCN = children with special health care needs.

**Source:** Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2002-2007.

**Denominator:** U.S. civilian noninstitutionalized population ages 3-6.

- From 2002 to 2007, the percentage of children ages 3-6 who ever had their vision checked by a health provider increased from 59.8% to 66.0% (Figure 2.19).
- Significant improvements were observed in large fringe metropolitan, small metropolitan, and micropolitan areas and among children with and without special health care needs.
- Children living in large central metropolitan areas tended to be less likely to receive vision checks than those living in large fringe metropolitan areas, but this difference was statistically significant in only 3 of 6 years.
- Children with special health care needs tended to be more likely to receive vision checks than those without such needs, but again, this difference was statistically significant in only 3 of 6 years.

# Effectiveness of Care

Also, in the NHDR:

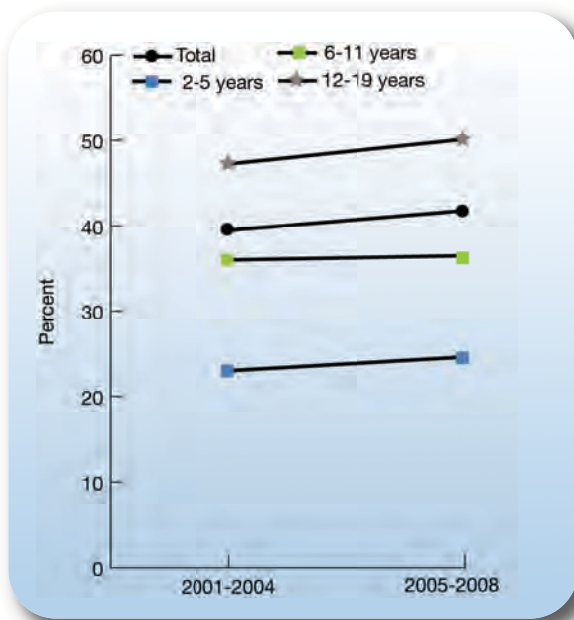
- Hispanic children tended to be less likely to receive vision checks than non-Hispanic White children.
- Poor, low-income, and middle-income children tended to be less likely to receive vision checks than high-income children.

## Prevention: Weight Monitoring of Overweight Children

American children are getting heavier. Overweight children are identified using growth charts that show body mass index (BMI) for age. These growth charts are based on national data collected between 1963 and 1994. Children with BMI values at or above the 95th percentile are considered overweight. From 1976-1980 to 2003-2006, the proportion of children classified as overweight increased from 6.5% to 17% among children ages 6 to 11 and from 5% to 17.6% among adolescents ages 12 to 19.<sup>36, 37</sup>

Pediatricians are advised to monitor BMI and excessive weight gain in children to recognize and address cases of overweight and obesity.<sup>38</sup> When providers alert young patients and their parents about their overweight status, a new opportunity is created to encourage the development of healthy diet and exercise habits that may be carried into adulthood.<sup>39</sup>

**Figure 2.20. People ages 2-19 who were overweight and who reported being told<sup>xxi</sup> by a health provider they were overweight, by age, 2001-2004 and 2005-2008**



**Source:** Centers for Disease Control and Prevention, National Center for Health Statistics, National Health and Nutrition Examination Survey, 2001-2004 and 2005-2008.

**Denominator:** U.S. civilian noninstitutionalized population ages 2-19 who were overweight.

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

<sup>xxi</sup> For children ages 2-15, a parent or guardian reported this information.



# Effectiveness of Care

- The percentage of people ages 2-19 who were overweight based on height and weight measurement and who reported being told by a health provider they were overweight did not change significantly between 2001-2004 and 2005-2008 overall or for any age group (Figure 2.20).
- In both time periods, overweight children ages 2-5 and 6-11 were less likely than overweight youths ages 12-19 to report being told by a health provider that they were overweight.

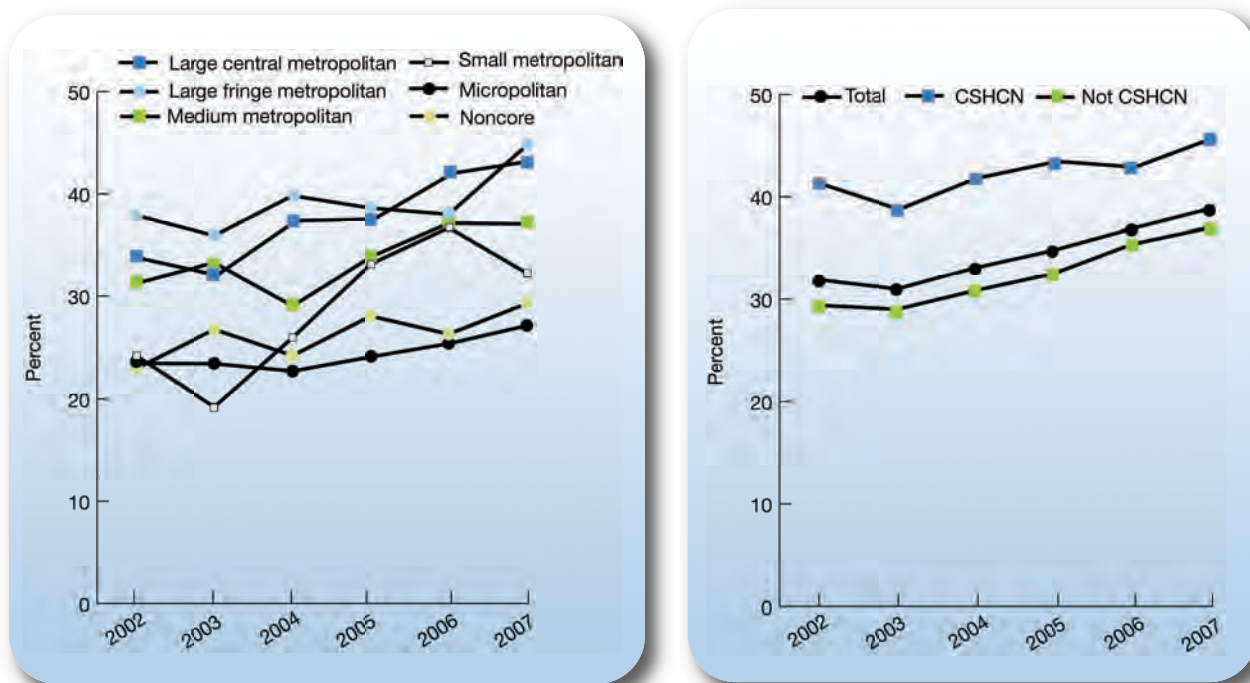
Also, in the NHDR:

- Non-Hispanic Blacks experienced an improvement between the two time periods. In 2005-2008, they were more likely than Non-Hispanic Whites to report being told by a health provider that they were overweight.

## Prevention: Counseling for Children About Physical Activity

Childhood represents a period when healthy lifelong habits are often formed. Physicians can play an important role in encouraging healthy behaviors, such as regular exercise, in children.

**Figure 2.21. Children ages 2-17 for whom a health provider ever gave advice about the amount and kind of exercise, sports, or physically active hobbies they should have, by geographic location and special health care needs, 2002-2007**



Key:

CSHCN = children with special health care needs.

Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2002-2007.

Denominator: U.S. civilian noninstitutionalized population ages 2-17.

- From 2002 to 2007, the percentage of children for whom a health provider ever gave advice about the amount and kind of exercise, sports, or physically active hobbies they should have increased from 31.9% to 38.8% (Figure 2.21), about 4% per year.

# Effectiveness of Care

- Significant improvements were observed among children in large central metropolitan, large fringe metropolitan, and small metropolitan areas and among children without special health care needs.
- In all years, children in micropolitan and noncore areas were less likely than children in large fringe metropolitan areas to receive advice about exercise.
- In all years, children with special health care needs were more likely than children without such needs to receive advice about exercise.

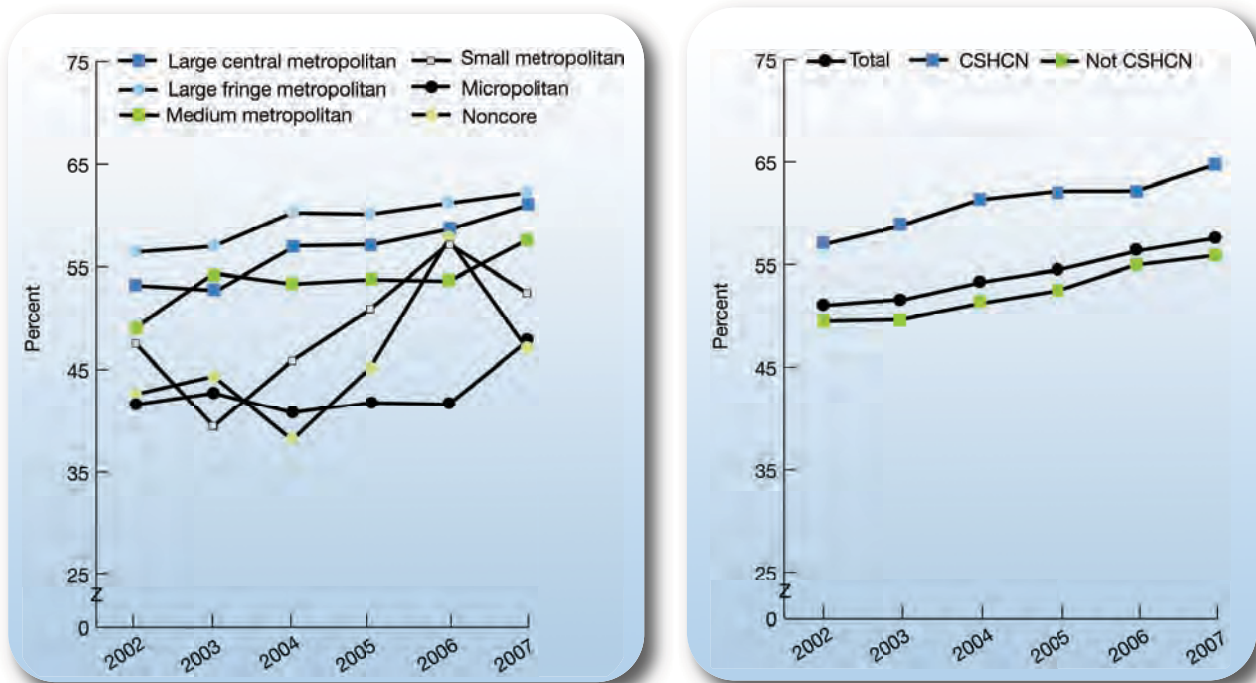
Also, in the NHDR:

- In all years, poor, low-income, and middle-income children were less likely than high-income children and uninsured children were less likely than privately insured children to receive advice about exercise.

## Prevention: Counseling for Children About Healthy Eating

Physicians play an important role in encouraging children's healthy eating. Overweight and obesity during childhood often persist into adulthood, with consequences that are numerous and costly. Unfortunately, overweight and obesity among children under age 18 have risen dramatically in the past two decades.<sup>38</sup> The American Academy of Pediatrics recommends that pediatricians discuss and promote healthy diets with all children and their parents or guardians, both those who are overweight and those who are not.<sup>38</sup>

**Figure 2.22. Children ages 2-17 for whom a health provider ever gave advice about healthy eating, by geographic location and special health care needs, 2002-2007**



**Key:** CSHCN = children with special health care needs.

**Source:** Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2002-2007.

**Denominator:** U.S. civilian noninstitutionalized population ages 2-17.

# Effectiveness of Care

- From 2002 to 2007, the percentage of children for whom a health provider ever gave advice about healthy eating increased from 51.0% to 57.6% (Figure 2.22), about 3% per year.
- Significant improvements were observed among children in all metropolitan areas and among children without special health care needs.
- In almost all years, children in small metropolitan areas, micropolitan areas, and noncore areas were less likely than children in large fringe metropolitan areas to receive advice about healthy eating.
- Children with special health care needs were more likely than children without such needs to receive advice about healthy eating.

Also, in the NHDR:

- In all years, poor, low-income, and middle-income children were less likely than high-income children to receive advice about healthy eating.
- Uninsured children were less likely than privately insured children to receive advice about healthy eating.



# Effectiveness of Care

## Mental Health and Substance Abuse

### Importance

#### Mortality

Number of deaths due to suicide (2007) .....	34,598 <sup>1</sup>
Rank among causes of death in the United States—suicide (2007) .....	11th <sup>1</sup>
Alcohol-impaired driving fatalities (2007).....	12,998 <sup>40</sup>

#### Prevalence

People age 12 and over with alcohol and/or illicit drug dependence or abuse in the past year (2008).....	22.2 million (9.0%) <sup>41</sup>
Adults age 18 and over with serious psychological distress in the past 30 days (2008) .....	10.2 million (4.5%) <sup>41</sup>
Youths ages 12-17 with a major depressive episode during the past year (2008) .....	2.0 million (8.3%) <sup>41</sup>
Adults age 18 and over with a major depressive episode during the past year (2008).....	14.3 million (6.4%) <sup>41</sup>
Adults with at least one major depressive episode in their lifetime (2006) .....	30.4 million (13.9%) <sup>42</sup>

#### Cost

National expenditures for treatment of mental health and substance abuse disorders (2003 est.) .....	\$121 billion <sup>43</sup>
Cost-effectiveness of screening and brief counseling for problem drinking .....	\$0-\$14,000/QALY <sup>5</sup>

### Measures

The NHQR and NHDR track measures of the quality of treatment for major depression and substance abuse. Mental health treatment includes counseling, inpatient care, outpatient care, and prescription medications. This section highlights three core measures of mental health and substance abuse treatment:

- Receipt of treatment for depression.
- Suicide deaths.
- Receipt of needed treatment for illicit drug use or alcohol problem.

In addition, one supporting measure is discussed:

- Completion of substance abuse treatment.

# Effectiveness of Care

According to data from the Healthcare Cost and Utilization Project, in 2007, 12.5% of emergency department visits (12 million visits) were related to mental health and substance abuse.<sup>44</sup> About 40% of these emergency department visits resulted in hospital admission (4.8 million visits). In 2006, approximately 1.4 million hospitalizations were specifically for mental health conditions<sup>45</sup> and 1 in 5 hospital stays included some mention of a mental health condition as either a principal or secondary diagnosis. Mood disorders were the most common principal diagnosis for all nonelderly people. For individuals age 65 and over, dementia and associated cognitive disorders were the most common cause of mental health hospitalizations.

Social and cultural factors may dramatically affect mental health. Culturally and linguistically appropriate services can decrease the prevalence, incidence, severity, and duration of certain mental disorders. However, many factors adversely affect the mental health of racial and ethnic groups, such as discrimination<sup>xxii</sup> and racism. Some factors also present significant barriers to treatment. These include cost of care, lack of sufficient insurance for mental health services, social stigma, fragmented organization of services,<sup>46</sup> and mistrust.

In addition, economic factors can have a significant effect on mental health. For example, poverty can be a risk factor for poor mental health and a result of poor mental health. Nevertheless, low-income individuals may be more likely to receive needed substance abuse treatment due to linkages in service delivery between substance abuse and public assistance services in many States.

In rural and remote areas, many people with mental illnesses have less adequate access to care, more limited availability of skilled care providers, lower family incomes, and greater societal stigma for seeking mental health treatment than their urban counterparts. In addition, rural Americans are less likely to have private health insurance benefits for mental health care. Lack of coverage often occurs because small employers and individual purchasers dominate the rural health insurance marketplace. Therefore, insurance policies are more likely to have limited or no mental health coverage.

For racial and ethnic populations in rural areas, these problems are compounded by the lack of culturally and linguistically competent providers. As of September 2009, the number of federally designated mental health professional shortage areas reached 3,291.<sup>47</sup>

## Findings

### Treatment: Receipt of Treatment for Depression

It has been estimated that about 1 out of 7 individuals in the United States will have a major depressive episode in their lifetime.<sup>42</sup> Treatment can be very effective in reducing symptoms and associated illnesses and returning individuals to a productive lifestyle.

For example, the Sequenced Treatment Alternatives to Relieve Depression study, funded by the National Institute of Mental Health, was the largest clinical trial ever conducted to help determine the most effective treatment strategies for major depressive disorder. It involved both primary care and specialty care settings. Participants included people with complex health conditions, such as multiple concurrent medical and

---

<sup>xxii</sup> The Office for Civil Rights (OCR) (<http://www.hhs.gov/ocr/>) is the sole Department of Health and Human Services agency with the authority to enforce Title VI of the Civil Rights Act of 1964, 42 U.S.C. 2000d, which prohibits discrimination based on race, color, or national origin in programs and activities that receive Federal financial assistance, including most health care providers and human service agencies. Individuals and advocacy groups may file complaints with OCR to remedy such discrimination.

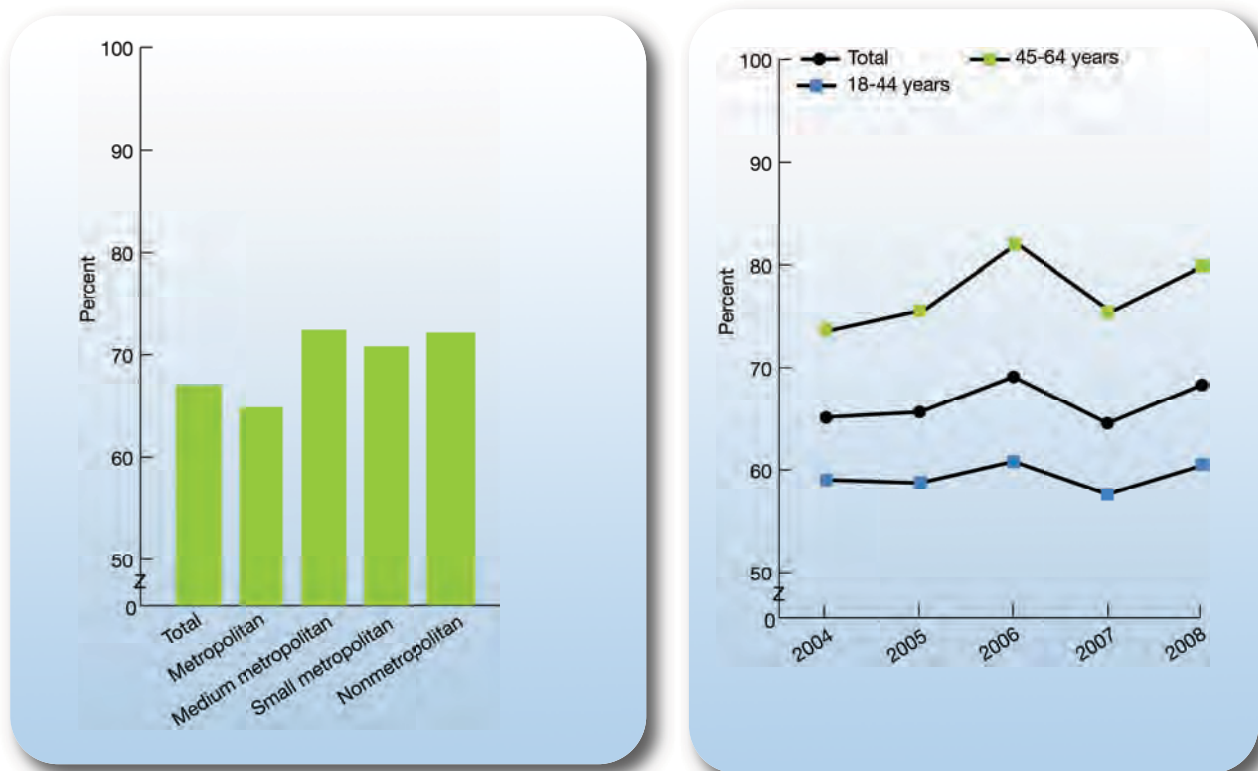


# Effectiveness of Care

psychiatric conditions.<sup>48</sup> This study found that between 28% and 33% of participants achieved a symptom-free state after the first round of medication, and most of those that continued in the trial had to try multiple different treatment options, including psychotherapy, to receive symptom relief. Nearly 70% of those who remained did achieve remission after 12 months.<sup>49, 50</sup>

Strategies for treating depression in primary care settings such as the collaborative care model have been shown to generate positive net social benefits in cost-benefit analyses compared with usual care. This is true under a wide range of assumptions regarding the monetary value of a quality adjusted life year (QALY).<sup>51-53</sup> Recent demonstration efforts are also showing promising results for the effectiveness of implementing the collaborative care model in everyday practices.<sup>54</sup>

**Figure 2.23. Adults with a major depressive episode in the past year who received treatment for depression in the past year, by geographic location, 2008, and by age, 2004-2008**



**Source:** Substance Abuse and Mental Health Services Administration, National Survey on Drug Use and Health, 2004-2008.

**Denominator:** Adults age 18 and over with a major depressive episode in the last 12 months.

**Note:** Total includes adults age 65 and over, but sample sizes are too small to allow separate estimates for this age group. Major depressive episode is defined as a period of at least 2 weeks when a person experienced a depressed mood or loss of interest or pleasure in daily activities and had a majority of the symptoms of depression described in the fourth edition of the *Diagnostic and Statistical Manual of Mental Disorders*. Treatment for depression is defined as seeing or talking to a medical doctor or other professional or using prescription medication in the past year for depression.



# Effectiveness of Care

- In 2008, 68.3% of adults under age 65 with a major depressive episode received treatment for depression (Figure 2.23). There was no statistically significant improvement in this measure compared with 2004.
- In all years, adults ages 18-44 were less likely to receive treatment for depression than those ages 45-64.
- In 2008, there were no statistically significant differences overall between metropolitan areas and nonmetropolitan areas. However, among metropolitan areas, residents of medium metropolitan areas with depression were more likely than residents of large metropolitan areas to receive treatment for depression in the past year (72.4% compared with 64.9%).

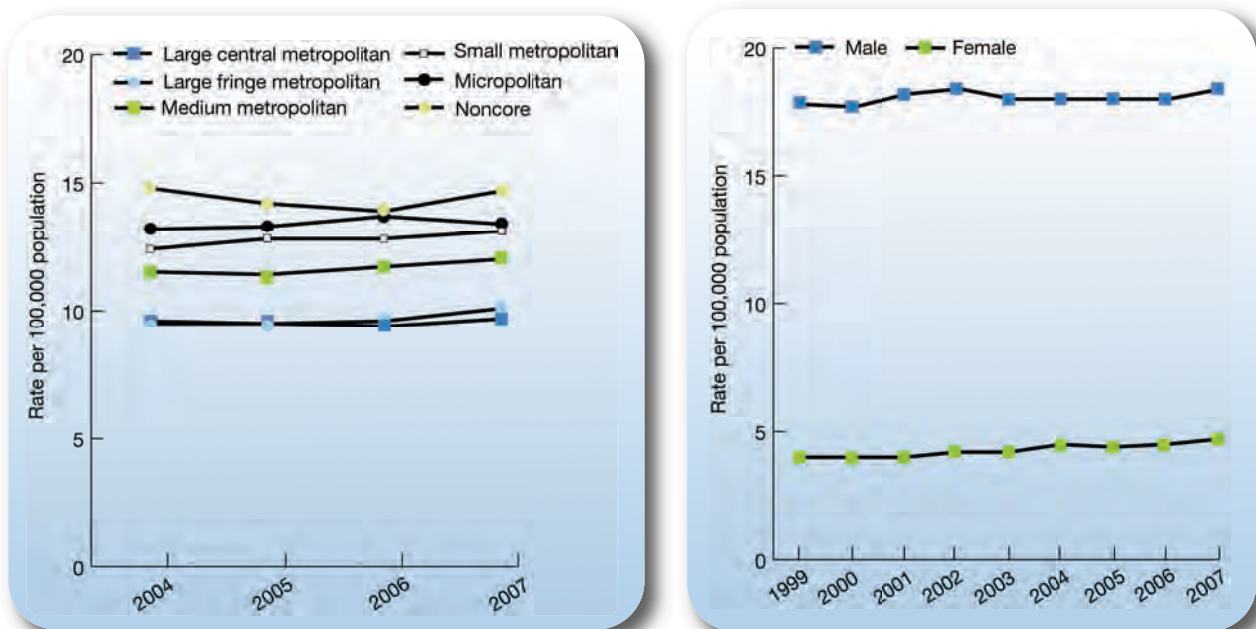
Also, in the NHDR:

- In 2008, Blacks and Hispanics were less likely to receive treatment for depression than Whites and non-Hispanic Whites.
- Females were more likely than males to receive treatment for depression.

## Outcome: Suicides

More than 90% of patients who die by suicide have mental illnesses, such as depression, schizophrenia, or substance abuse.<sup>55</sup> Suicide may be prevented when its warning signs are detected and treated. A previous suicide attempt is among the strongest predictors of subsequent suicide. Cognitive-behavioral therapy can significantly help those who have attempted suicide consider alternative actions when thoughts of self-harm arise.<sup>56</sup> Cognitive therapy has been shown to reduce suicide attempts by half during a year of followup.<sup>57</sup>

**Figure 2.24. Suicide deaths per 100,000 population, by residence location, 2004-2007, and gender, 1999-2007**



**Source:** Centers for Disease Control and Prevention, National Center for Health Statistics, National Vital Statistics System—Mortality, 1999-2007.

**Denominator:** Civilian noninstitutionalized population.

**Note:** Estimates are age adjusted to the 2000 standard population. Data for residence location were not available for years 1999-2003.

# Effectiveness of Care

- Overall, from 1999 to 2007, the suicide rate increased from 10.5 per 100,000 to 11.3 per 100,000 population (data not shown).
- In 2007, noncore areas had the highest suicide rates (14.7 per 100,000) while large central metropolitan areas had the lowest suicide rates (9.7 per 100,000; Figure 2.24). Large central metropolitan areas had lower suicide rates compared with large fringe metropolitan areas (9.7 per 100,000 compared with 10.1 per 100,000).
- From 1999 to 2007, males had suicide rates almost four times as high as females (in 2007, 18.4 per 100,000 compared with 4.7 per 100,000).

Also, in the NHDR:

- Whites and non-Hispanic Whites had the highest suicide rates compared with other racial and ethnic groups.

## Treatment: Receipt of Needed Treatment for Illicit Drug Use or Alcohol Problem

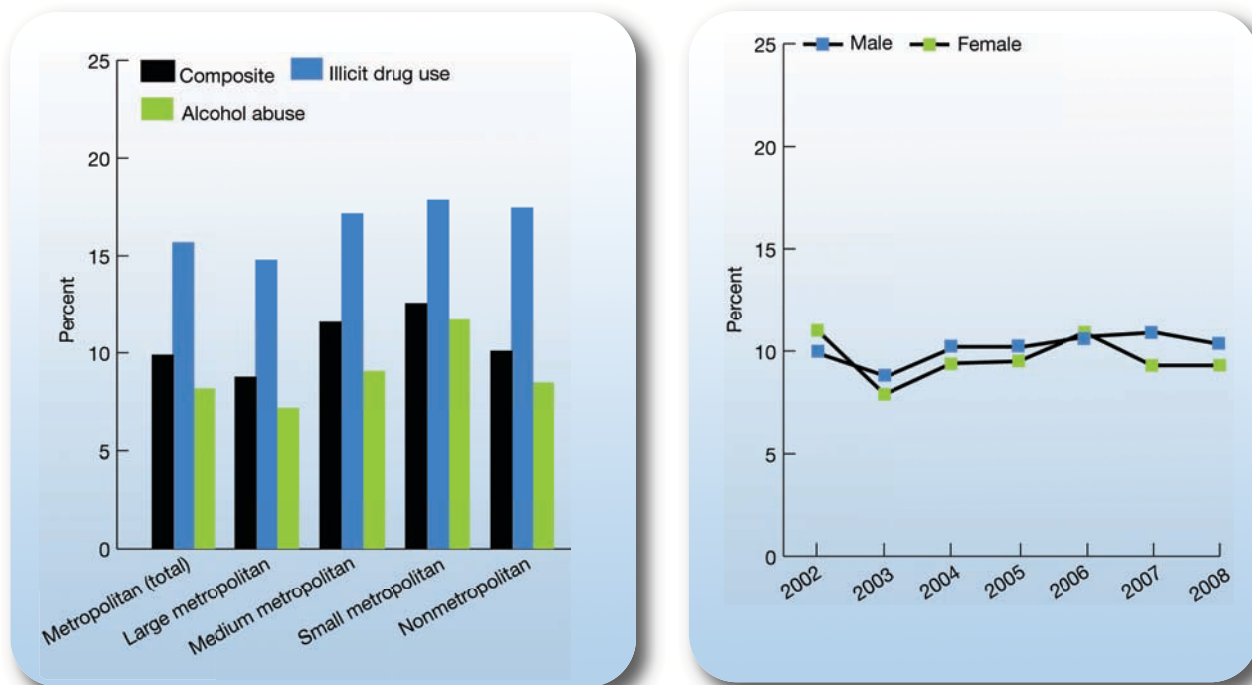
Illicit drug<sup>xxiii</sup> use is a medical problem that can have a direct toxic effect on a number of bodily organs and exacerbate numerous health and mental health conditions. Alcohol problems also can lead to serious health risks. Heavy drinking can increase the risk of certain cancers and cause damage to the liver, brain, and other organs.<sup>58</sup> In addition, alcohol can cause birth defects, including fetal alcohol syndrome.<sup>59, 60</sup> Alcoholism increases the risk of death from car crashes and other injuries.<sup>61</sup> Treatment for illicit drug use or an alcohol problem at a specialty facility is an effective way to reduce the chances of future illicit drug use or alcohol problems.

---

<sup>xxiii</sup> Illicit drugs included in this measure are marijuana/hashish, cocaine (including crack), inhalants (e.g., inhalation of various substances other than for intended use, such as toluene), hallucinogens, heroin, and prescription-type psychotherapeutic drugs (nonmedical use).

# Effectiveness of Care

**Figure 2.25. People age 12 and over who needed treatment for illicit drug use or an alcohol problem and who received such treatment at a specialty facility in the last 12 months, overall composite and two components, by geographic location, 2008, and composite by gender, 2002-2008**



**Source:** Substance Abuse and Mental Health Services Administration, National Survey on Drug Use and Health, 2002-2008.

**Denominator:** Civilian noninstitutionalized population age 12 and over who needed treatment for any illicit drug use or alcohol problem.

**Note:** Treatment refers to treatment at a specialty facility, such as a drug and alcohol inpatient and/or outpatient rehabilitation facility, inpatient hospital setting, or a mental health center. Data for county type categories have changed for 2008 and are not comparable to historical data previously used in the reports.

- There were no significant differences by location in the percentage of people age 12 and over who needed treatment for illicit drug use or an alcohol problem and received it at a specialty facility in the last 12 months (Figure 2.25).
- From 2002 to 2008, there was no significant change for males and females who needed and received treatment for illicit drug use or alcohol treatment. There was no statistically significant difference between males and females.

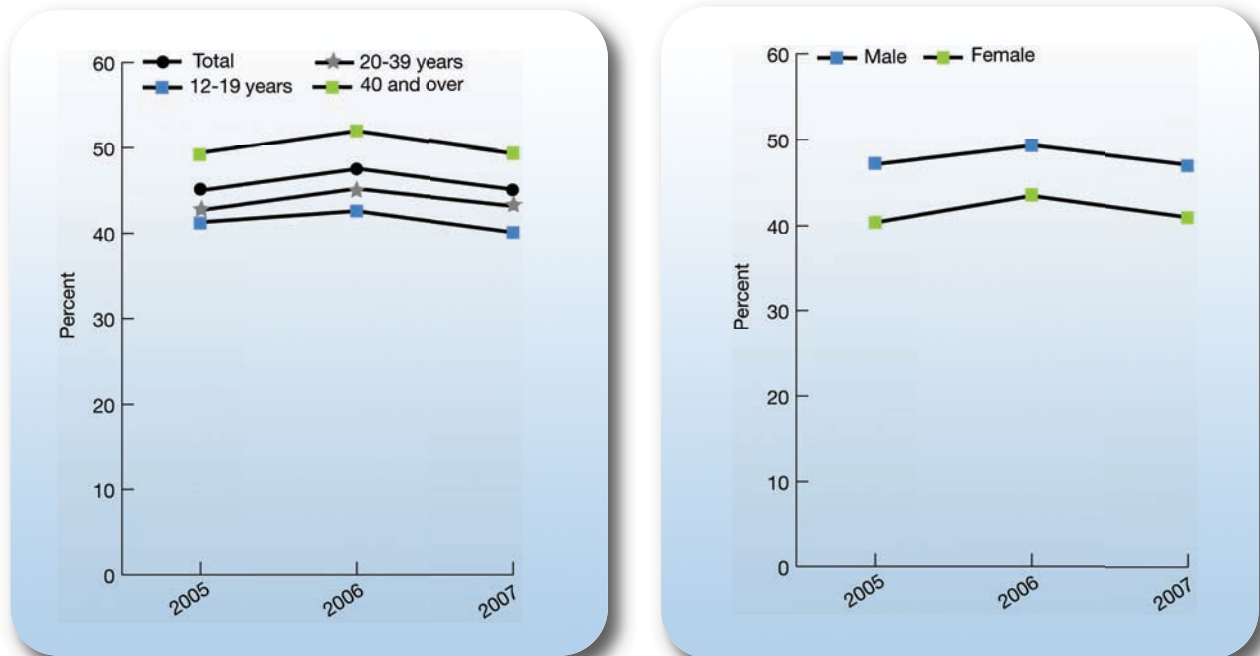
Also, in the NHDR:

- In 2008, there were no statistically significant differences between racial or ethnic groups in the percentage of people age 12 and over who needed treatment for illicit drug use or an alcohol problem and received it at a specialty facility in the last 12 months.
- In 2008, poor and near-poor people who needed treatment were more likely than high-income people who needed treatment to have received treatment for illicit drug use or an alcohol problem.
- Adults with less than a high school education who needed treatment were more likely than adults with at least some college who needed treatment to have received treatment.

# Effectiveness of Care

## Treatment: Completion of Substance Abuse Treatment

Figure 2.26. People age 12 and over treated for substance abuse who completed treatment course, by age and gender, 2005-2007



**Source:** Substance Abuse and Mental Health Services Administration, Treatment Episode Data Set, Discharge Data Set, 2005-2007.  
**Denominator:** Discharges age 12 and over from publicly funded substance abuse treatment facilities.

- From 2005 to 2007, the overall percentage of people age 12 and over treated for substance abuse who completed the treatment course did not change significantly (Figure 2.26). In 2007, people ages 12-19 were less likely to complete substance abuse treatment compared with those age 20 and over.
- Females who were treated for substance abuse were significantly less likely than males to complete treatment (41.0% compared with 47.1%).

Also, in the NHDR:

- People with less than a college education were significantly less likely than people with a college education to complete treatment.

# Effectiveness of Care

## Respiratory Diseases

### Importance

#### Mortality

Number of deaths due to chronic lower respiratory diseases <sup>xxiv</sup> (2007).....	127,924 <sup>1</sup>
Number of deaths, influenza and pneumonia combined (2007).....	52,717 <sup>1</sup>
Cause of death rank, chronic lower respiratory diseases (2007).....	4th <sup>1</sup>
Cause of death rank for influenza and pneumonia combined (2007).....	8th <sup>1</sup>

#### Prevalence

Adults age 18 and over with current asthma (2009) .....	17.5 million <sup>62</sup>
Children under age 18 with current asthma (2009).....	7.1 million <sup>63</sup>
People under age 18 with an asthma attack in the last 12 months (2007).....	3.8 million <sup>64</sup>
Annual number of cases of the common cold .....	>1 billion <sup>65</sup>
Number of discharges attributable to pneumonia (2007) .....	1.2 million <sup>66</sup>

#### Incidence

Annual number of pneumonia cases due to <i>Streptococcus pneumoniae</i> .....	500,000 <sup>67</sup>
New cases of tuberculosis (2008).....	12,898 <sup>68</sup>

#### Cost

Total cost of lung diseases (2009 est.).....	\$177.4 billion <sup>69</sup>
Direct medical costs of lung diseases (2009 est.).....	\$113.6 billion <sup>69</sup>
Total cost of upper respiratory infections (annual est.) .....	\$40 billion <sup>70</sup>
Total cost of asthma (2007 est.).....	\$19.7 billion <sup>71</sup>
Direct medical costs of asthma (2007 est.) .....	\$14.7 billion <sup>71</sup>
Cost-effectiveness of influenza immunization .....	\$0-\$14,000/QALY <sup>5</sup>

<sup>xxiv</sup> Chronic lower respiratory diseases include emphysema and chronic bronchitis.

# Effectiveness of Care

## 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:

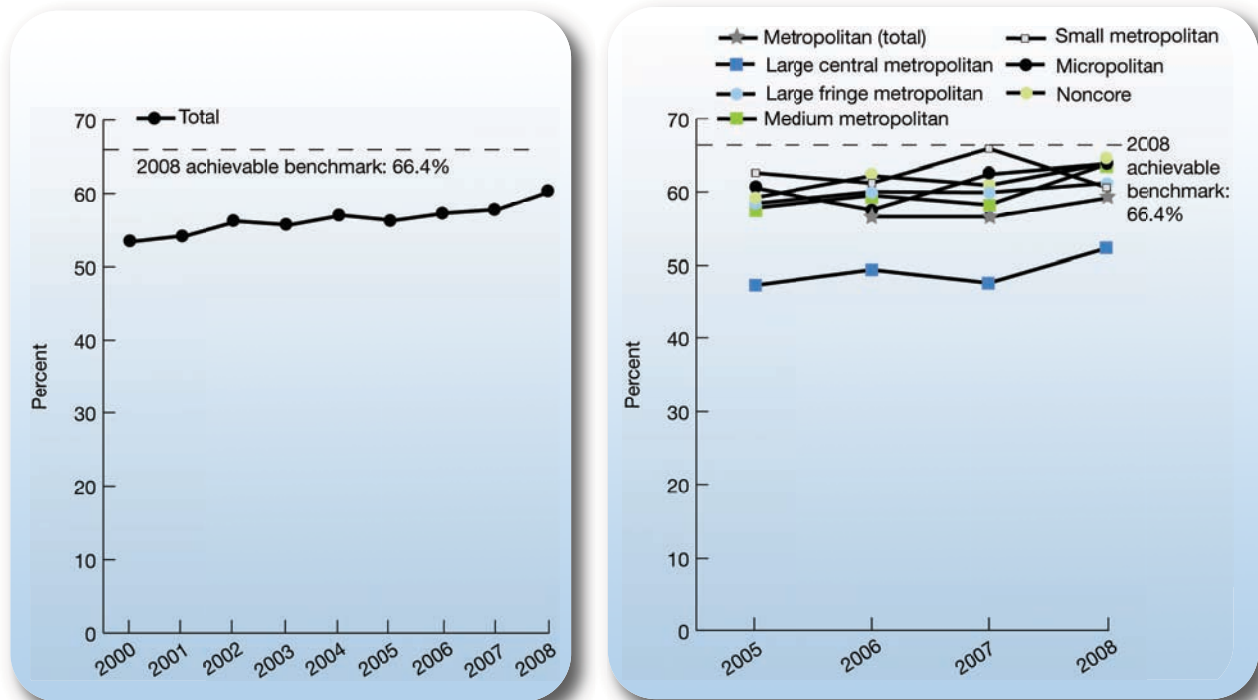
- Pneumococcal vaccination.
- Receipt of recommended care for pneumonia.
- Completion of tuberculosis therapy.
- Daily asthma medication.

## Findings

### Prevention: Pneumococcal Vaccination

Vaccination is a cost-effective strategy for reducing illness and death associated with pneumonia and influenza.<sup>72, 73</sup>

**Figure 2.27. Adults age 65 and over who reported having ever received pneumococcal vaccination, 2000-2008, and by residence location, 2005-2008**



**Source:** Centers for Disease Control and Prevention, National Center for Health Statistics, National Health Interview Survey, 2000-2008.

**Denominator:** Civilian noninstitutionalized population age 65 and over.

**Note:** Age adjusted to the 2000 U.S. standard population. Data for residence location were not available from 2000-2004. Benchmark is derived from the Behavioral Risk Factor Surveillance System (BRFSS); see Introduction and Methods for details.



# Effectiveness of Care

- Overall, the percentage of adults age 65 and over who reported having ever received pneumococcal vaccination increased from 53.4% in 2000 to 60.3% in 2008 (Figure 2.27).
- In 2008, among residents of metropolitan areas, adults age 65 and over in large central metropolitan areas (52.3%) were least likely to report having received pneumococcal vaccination while adults age 65 and over in medium metropolitan areas (63.8%) were most likely to report having received pneumococcal vaccination. There were no statistically significant differences between nonmetropolitan areas.
- The 2008 top 5 State achievable benchmark was 66.4%.<sup>xxv</sup> At the current 1.2% annual rate of increase, this benchmark could be attained overall in about 9 years.

Also, in the NHDR:

- In 2008, the percentage of adults age 65 and over who reported having ever received pneumococcal vaccination was significantly lower for Blacks and Asians than for Whites; for Hispanics compared with non-Hispanic Whites; and for poor people compared with high-income people.
- Whites could attain the achievable benchmark in about 6 years, while Blacks and Asians would not attain the benchmark for 14 years and 25 years, respectively. Hispanics would not attain the benchmark for about 54 years.

## Treatment: Receipt of Recommended Care for Pneumonia

Older adults are at high risk for pneumonia. The highest rate of hospitalizations for pneumonia occurs in the population age 65 and over—220.4 per 10,000 population for this group in 2004, compared with 45.5 per 10,000 for the overall population.<sup>74</sup>

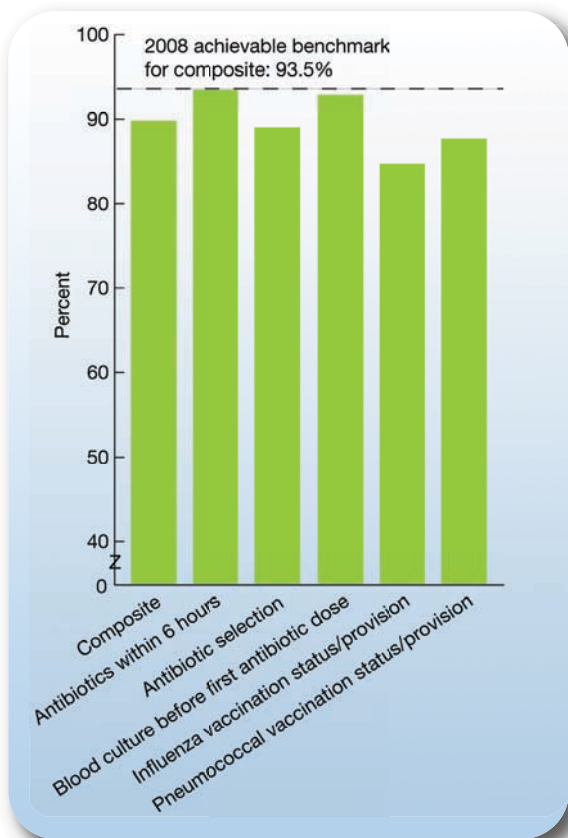
CMS tracks a set of measures for quality of pneumonia care for hospitalized patients from the CMS Quality Improvement Organization Program. This set of measures has been adopted by the Hospital Quality Alliance. Recommended care for patients with pneumonia includes receipt of (1) initial antibiotics within 6 hours of hospital arrival, (2) antibiotics consistent with current recommendations, (3) blood culture before antibiotics are administered, (4) influenza vaccination status assessment/vaccine provision, and (5) pneumococcal vaccination status assessment/vaccine provision. The NHQR tracks receipt of each process measure as well as an overall composite.

---

<sup>xxv</sup> The top 5 States that contributed to the achievable benchmark are Colorado, Delaware, Maine, New Hampshire, and Oklahoma.

# Effectiveness of Care

**Figure 2.28. Hospital patients with pneumonia who received recommended hospital care: Overall composite and five components, 2008**



**Source:** Centers for Medicare & Medicaid Services, Medicare Quality Improvement Organization Program, 2008.

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

- Among the five components of the composite measure, patients were most likely to receive antibiotics within 6 hours (93.5%) and least likely to have their influenza vaccination status assessed (84.7%) (Figure 2.28).
- In 2008, the top 5 State achievable benchmark was 93.5%.<sup>xxvi</sup> The available data were not sufficient to calculate time to benchmark.

Also, in the NHDR:

- In 2008, the percentage of patients with pneumonia who received recommended hospital care was significantly lower for Blacks, Asians, AI/ANs, and Hispanics compared with Whites.

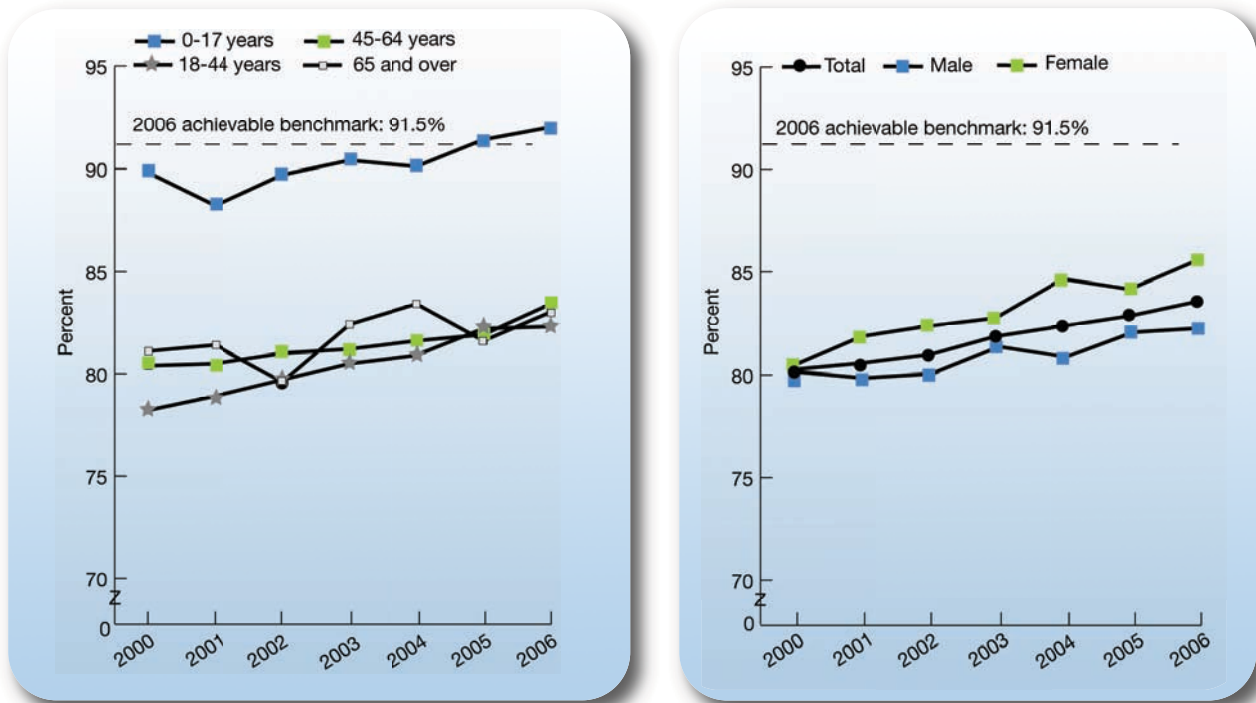
## Outcome: Completion of Tuberculosis Therapy

To be effective for individuals as well as the public, tuberculosis therapy must be taken to its completion. Failure to complete tuberculosis therapy puts patients at increased risk for treatment failure and for spreading the disease to others. Even worse, it may result in the development of drug-resistant strains of the disease.<sup>75</sup>

<sup>xxvi</sup> The top 5 States contributing to the achievable benchmark are Iowa, Maine, New Hampshire, New Jersey, and Vermont.

# Effectiveness of Care

**Figure 2.29. Patients with tuberculosis who completed a curative course of treatment within 1 year of initiation of treatment, by age, and gender, 2000-2006.**



**Source:** Centers for Disease Control and Prevention, National Tuberculosis Surveillance System, 1999-2006.

**Denominator:** U.S. civilian noninstitutionalized population treated for tuberculosis.

- The percentage of adults ages 18-44 who completed tuberculosis therapy within 1 year increased from 78.2% in 2000 to 82.3% in 2006 (Figure 2.29).
- In all years, children ages 0-17 with tuberculosis were more likely than adults age 18 and over to complete a curative course of treatment within 1 year of initiation of treatment.
- The percentage of adults who completed tuberculosis therapy within 1 year improved for both males and females from 1999 to 2006. However, in 2006, females were more likely to complete treatment than males (85.5% compared with 82.2%).
- The 2006 top 5 State achievable benchmark was 91.5%.<sup>xxvii</sup> At the current 0.7% annual rate of increase, this benchmark could be attained overall in about 14 years.

Also, in the NHDR:

- In the general population, there were no significant differences by race but Hispanics were less likely than non-Hispanic Whites to complete tuberculosis therapy within 1 year.

<sup>xxvii</sup> The top 5 States contributing to the achievable benchmark are Alaska (tied), Indiana (tied), Kansas, Maryland, and Oregon.

# Effectiveness of Care

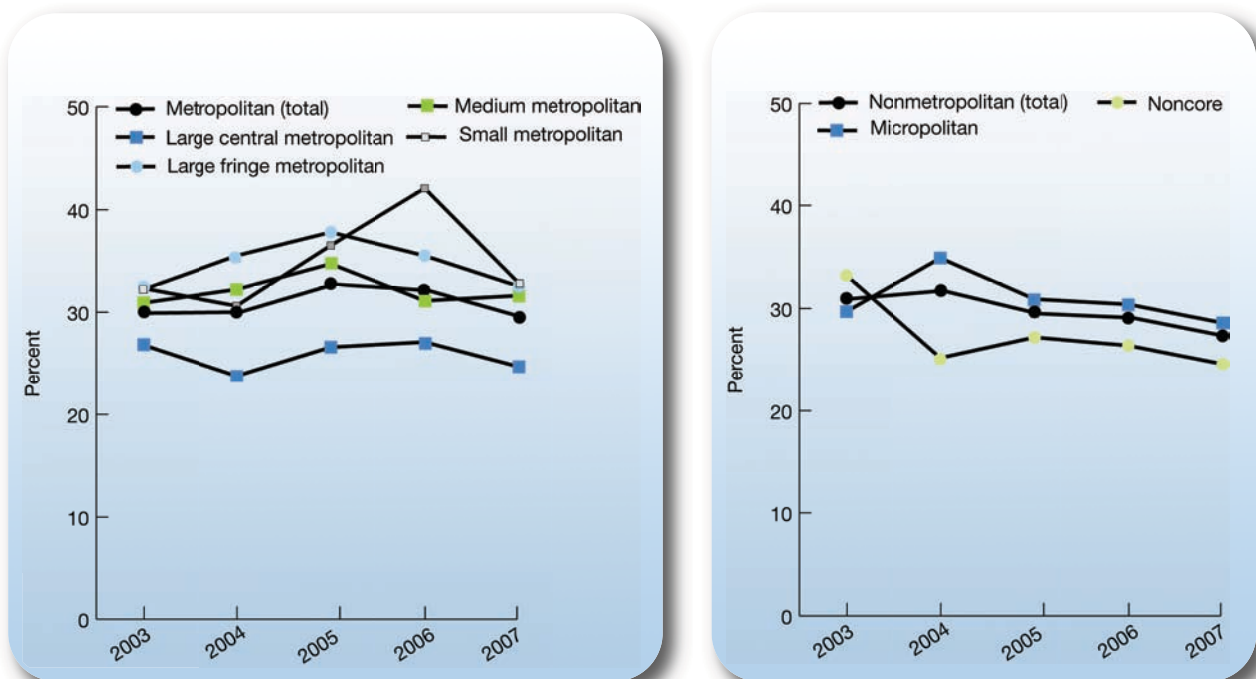
- Among the foreign-born population, Blacks and Asians were more likely than foreign-born Whites to complete tuberculosis therapy within 1 year.
- Among the foreign born population, Whites would not attain the achievable benchmark for about 31 years, while Blacks and Asians would not attain the benchmark for 13 years and 19 years, respectively. Hispanics would not achieve the benchmark for 28 years.

## Management: Daily Asthma Medication

Improving quality of care for people with asthma can reduce the occurrence of asthma attacks and avoidable hospitalizations. The National Asthma Education and Prevention Program, coordinated by the National Heart, Lung, and Blood Institute, develops and disseminates science-based guidelines for asthma diagnosis and management.<sup>76</sup> These recommendations are built around four essential components of asthma management critical for effective long-term control of asthma: assessment and monitoring, control of factors contributing to symptom exacerbation, pharmacotherapy, and education for partnership in care.<sup>77</sup>

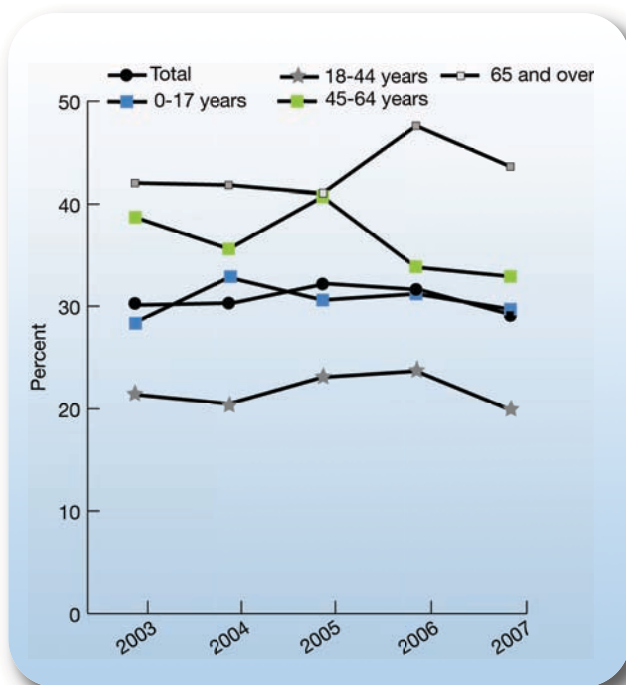
Daily long-term controller medication is necessary to prevent exacerbations and chronic symptoms for all patients with persistent asthma. Appropriate controller medications for people with mild persistent asthma<sup>78, xxviii</sup> include inhaled corticosteroids, cromolyn, nedocromil, theophylline, and leukotriene modifiers.<sup>79</sup>

**Figure 2.30. People with current asthma who are now taking preventive medicine daily or almost daily (either oral or inhaler), by geographic location and age, 2003-2007**



<sup>xxviii</sup> "Mild persistent asthma" refers to cases in which people experience asthma symptoms more than 2 days per week and more than 2 nights per month, as well as other clinical indicators.

# Effectiveness of Care



**Source:** Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2003-2007.

**Denominator:** Civilian noninstitutionalized population with asthma, as defined below.

**Note:** People with current asthma report that they still have asthma or had an asthma attack in the last 12 months.

- Of those with current asthma in 2007, 29.1% reported taking preventive medicine daily or almost daily (Figure 2.30).
- In 2007, people living in large central metropolitan areas were less likely than people living in large fringe metropolitan areas to take daily preventive medication (24.7% compared with 32.5%).
- There were no statistically significant differences among nonmetropolitan areas. Nor were there any statistically significant differences between metropolitan areas (total) and nonmetropolitan areas (total).

Also, in the NHDR:

- In 2007, poor people with current asthma were less likely than high-income people to take daily preventive medicine for asthma.
- In 2007, there were no statistically significant differences between people who spoke English at home and people who spoke another language at home.



# Effectiveness of Care

## Lifestyle Modification

### Importance

#### Mortality

Number of deaths per year attributable to smoking (2000-2004) -----443,000<sup>80</sup>

#### Prevalence

Number of adult current cigarette smokers (2007) -----46.6 million<sup>81</sup>

Number of obese adults (2005-2006) -----≥72 million<sup>82</sup>

Number of adults with no leisure-time physical activity (2007) -----84.8 million<sup>81</sup>

#### Cost

Total cost of smoking (2000-2004 est.)-----\$193 billion<sup>80</sup>

Total health care cost related to obesity (2008 est.) -----\$147 billion<sup>83</sup>

### Measures

Unhealthy behaviors place many Americans at risk for a variety of diseases. Lifestyle practices account for more than 40% of the differences in health among individuals.<sup>84</sup> A recent study examined the effects on incidence of coronary heart disease, stroke, diabetes, and cancer of four healthy lifestyles: never smoking, not being obese, engaging in at least 3.5 hours of physical activity per week, and eating a healthy diet (higher consumption of fruits, vegetables, and whole grain bread and lower consumption of red meat). Engaging in one healthy lifestyle compared with none cut the risk of developing these diseases in half while engaging in all four cut risk by 78%.<sup>85</sup> Unfortunately, healthy lifestyle practices have declined over the past two decades.<sup>85</sup>

Helping patients choose and maintain healthy lifestyles is a critical role of health care. The NHQR tracks several quality measures for modifying unhealthy lifestyles, including the following three core report measures:

- Counseling smokers to quit smoking.
- Counseling obese adults about exercise.
- Counseling obese adults about healthy eating.

In addition, one supporting measure is presented:

- Counseling obese adults about overweight.



# Effectiveness of Care

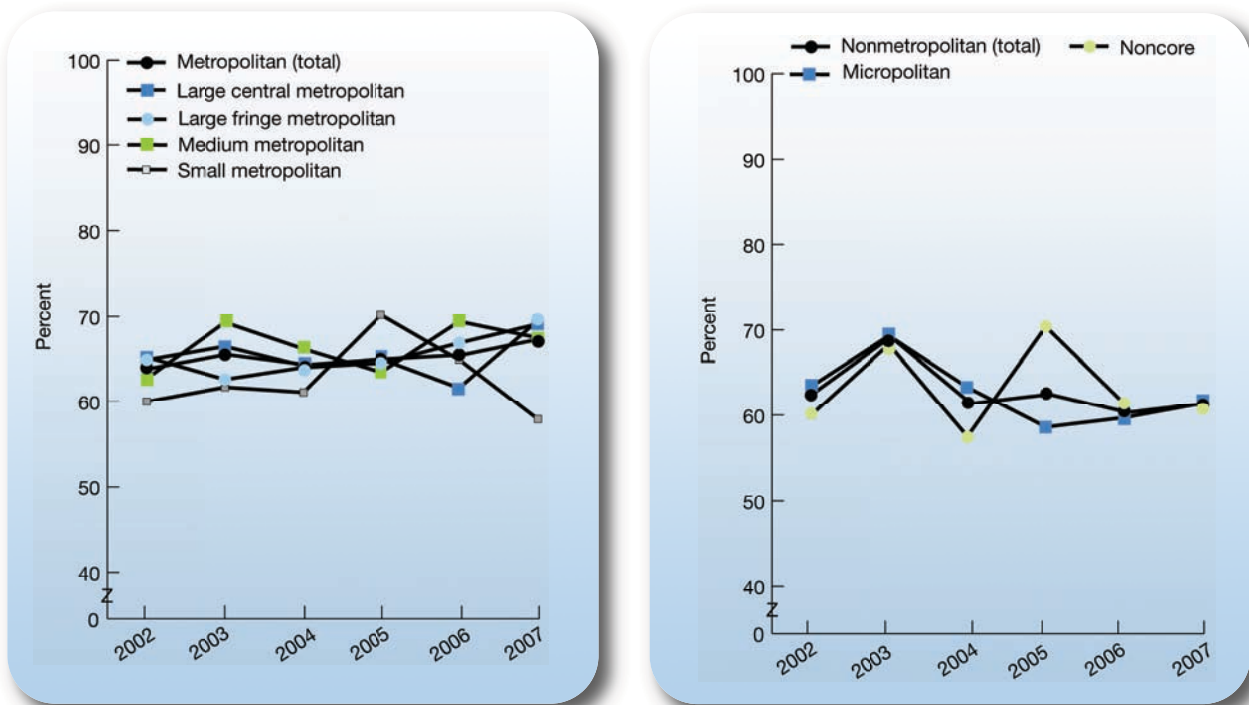
## Findings

### Prevention: Counseling Smokers To Quit Smoking

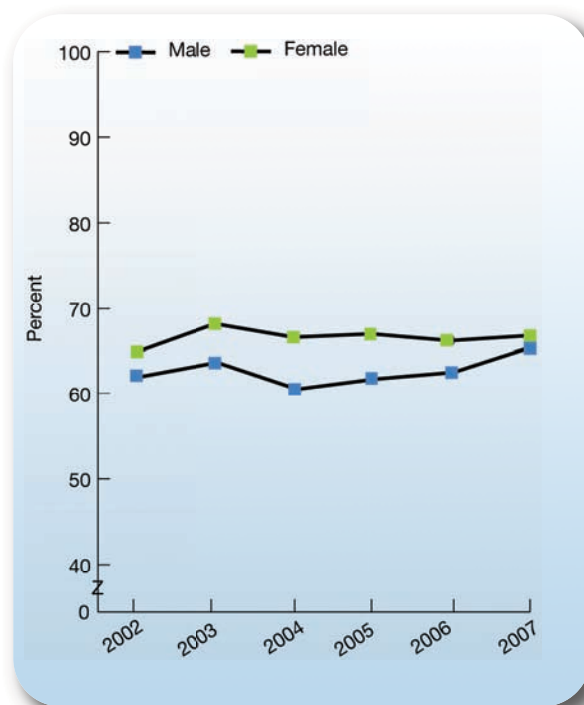
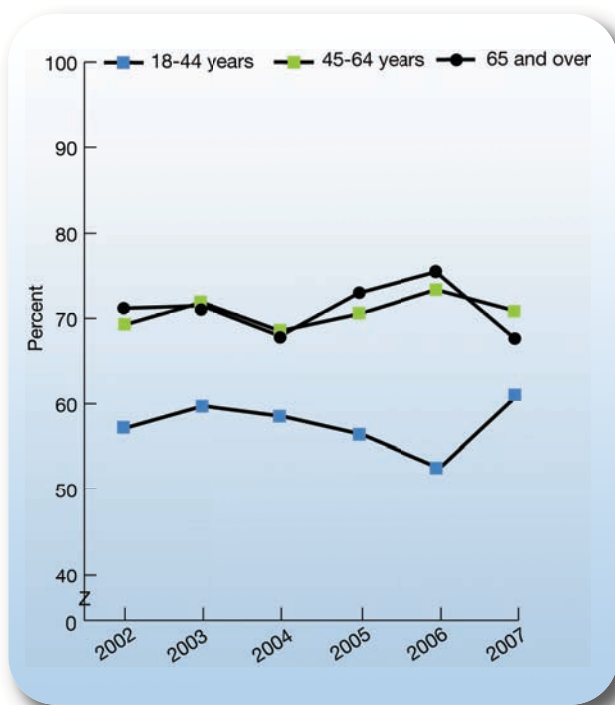
Smoking harms nearly every organ of the body and causes or exacerbates many diseases. Smoking causes more than 80% of deaths from lung cancer and more than 90% of deaths from chronic obstructive pulmonary disease.<sup>86</sup> Heart disease is the leading cause of death in the United States for both men and women,<sup>87</sup> with approximately 135,000 deaths due to smoking.<sup>88</sup> Cigarette smoking increases the risk of dying from coronary heart disease (CHD) two- to threefold.<sup>88</sup>

Quitting smoking has immediate and long-term health benefits. The risk of developing CHD attributed to smoking can be decreased by 50% after 1 year of cessation.<sup>89</sup> Smoking is a modifiable risk factor, and health care providers can help encourage patients to change their behavior and quit smoking.

**Figure 2.31. Adult current smokers with a checkup in the last 12 months who received advice to quit smoking, by geographic, age, and gender, 2002-2007**



# Effectiveness of Care



**Source:** Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2002-2007.

**Denominator:** Civilian noninstitutionalized adult current smokers who had a checkup in the last 12 months.

**Note:** Data for 2007 for noncore residents did not meet criteria for statistical reliability.

- In 2007, only 66.2% of current adult smokers overall who had a checkup in the last 12 months were advised to quit smoking (data not shown).
- There were no statistically significant differences between adult current smokers living in metropolitan areas and those living in nonmetropolitan areas in the percentage with a checkup in the last 12 months who received advice to quit smoking (Figure 2.31). Among metropolitan areas, residents of small metropolitan areas who were current smokers were least likely to receive advice to quit smoking (57.9%).
- From 2002 to 2007, female current adult smokers continued to be more likely than males to receive advice to quit smoking.

Also, in the NHDR:

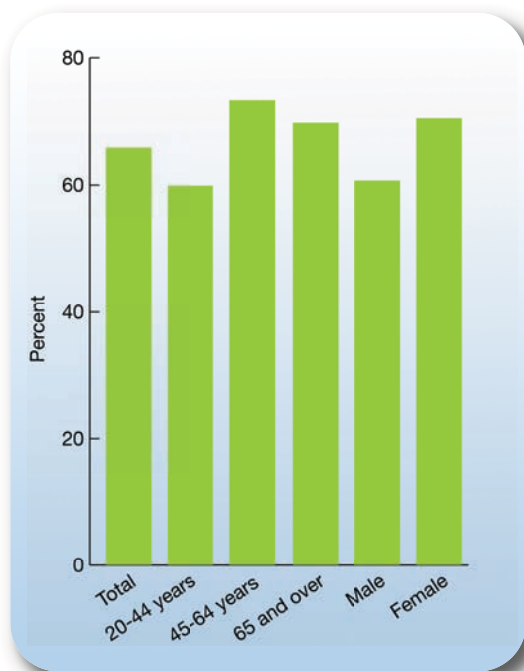
- There was improvement for poor patients from 2002 to 2007 (from 57.9% to 67.9%). However, in 2007 near-poor current adult smokers were significantly less likely than high-income current adult smokers to receive advice to quit smoking.

## Prevention: Counseling Obese Adults About Overweight

More than 34% of adults age 20 and over in the United States are obese (defined as having a BMI of 30 or higher),<sup>82</sup> putting them at increased risk for many chronic, often deadly conditions, such as hypertension, cancer, diabetes, and CHD.<sup>90</sup> Although physician guidelines recommend that health care providers screen all adult patients for obesity,<sup>91</sup> obesity remains underdiagnosed among U.S. adults.<sup>92</sup>

# Effectiveness of Care

**Figure 2.32. Adults with obesity who reported being told by a doctor they were overweight, by age and gender 2005-2008**



**Source:** Centers for Disease Control and Prevention, National Center for Health Statistics, National Health and Nutrition Examination Survey, 2005-2008.

**Denominator:** Civilian noninstitutionalized obese adults age 20 and over.

**Note:** Estimates are age adjusted to the 2000 standard population for total and gender using three age groups: 20-44, 45-64, and 65 and over.

- Overall in 2005-2008, 65.9% of obese adults age 20 and over reported being told by a doctor or health professional that they were overweight (Figure 2.32).
- Obese adults ages 45-64 and age 65 and over were more likely than obese adults ages 20-44 to report being told by a doctor that they were overweight (73.4% and 69.9%, respectively, compared with 59.9%).
- Female obese adults age 20 and over were more likely than males to report being told by a doctor that they were overweight (70.6% compared with 60.7%).

Also, in the NHDR:

- Black and Mexican-American obese adults were more likely than non-Hispanic White obese adults to report being told by a doctor that they were overweight.
- Poor, near-poor, and middle-income obese adults were less likely than high-income obese adults to report being told by a doctor they were overweight.
- Obese adults with less than a high school education and those with a high school education were less likely than obese adults with at least some college education to report being told by a doctor they were overweight.

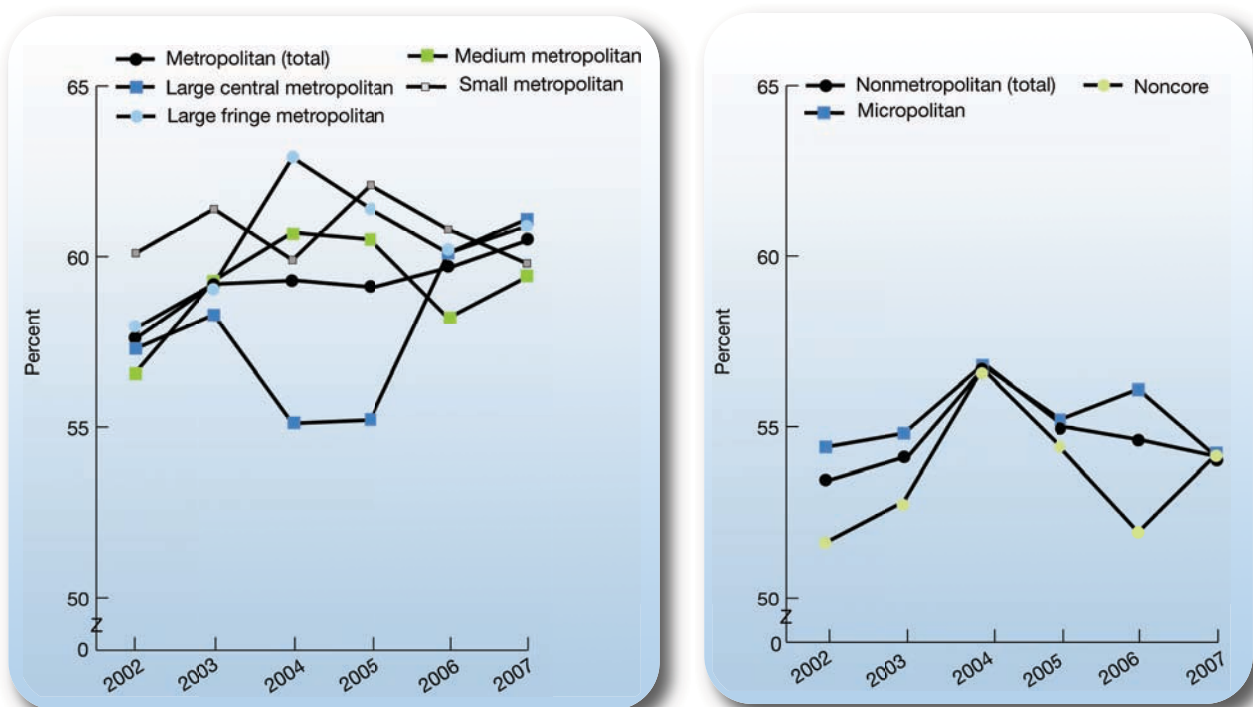
# Effectiveness of Care

## Prevention: Counseling Obese Adults About Exercise and Diet

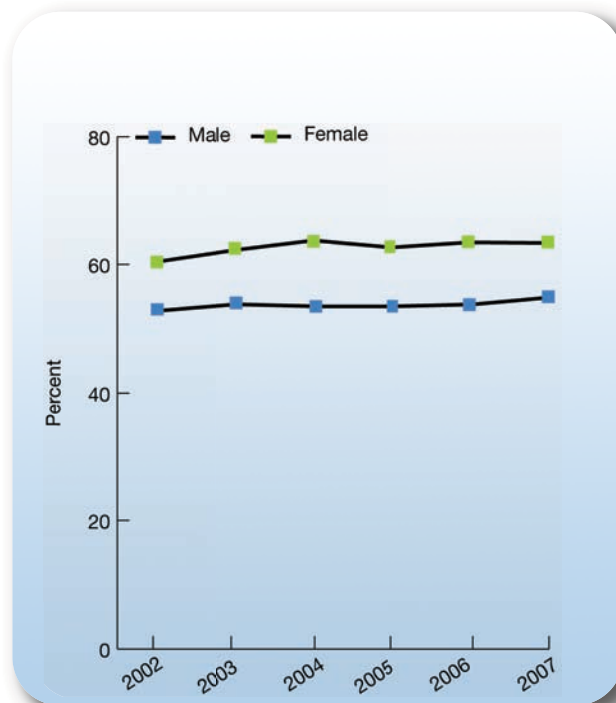
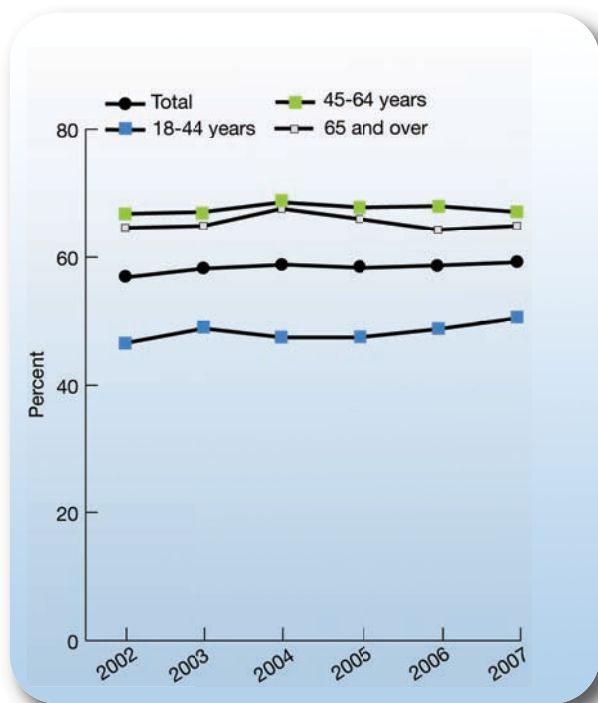
### Counseling Obese Adults About Exercise

Physician-based exercise and diet counseling is an important component of effective weight loss interventions,<sup>91</sup> and it has been shown to produce increased levels of physical activity among sedentary patients.<sup>93</sup> Although every obese person may not need counseling about exercise and diet, many would likely benefit from improvements in these activities. Regular exercise and a healthy diet aid in maintaining normal blood cholesterol levels, weight, and blood pressure, reducing the risk of heart disease, stroke, diabetes, and other comorbidities of obesity.

**Figure 2.33. Adults with obesity who ever received advice from a health provider to exercise more, by residence location, age, and gender, 2002-2007**



# Effectiveness of Care



**Source:** Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2002-2007.

**Denominator:** Civilian noninstitutionalized adults age 18 and over with obesity.

**Note:** Obesity is defined as a body mass index of 30 or higher.

- Overall, in 2007, 59.2% of adults with obesity had ever received advice from a health provider to exercise more (Figure 2.33).
- In 2007, adults with obesity who resided in nonmetropolitan areas were less likely to receive advice to exercise than those who resided in metropolitan areas (54.1% compared with 60.5%).
- In 2007, adults with obesity ages 18-44 were least likely to ever receive advice to exercise more.
- In 2007, female adults with obesity were more likely than males to ever receive advice to exercise more (63.3% compared with 54.9%).

Also, in the NHDR:

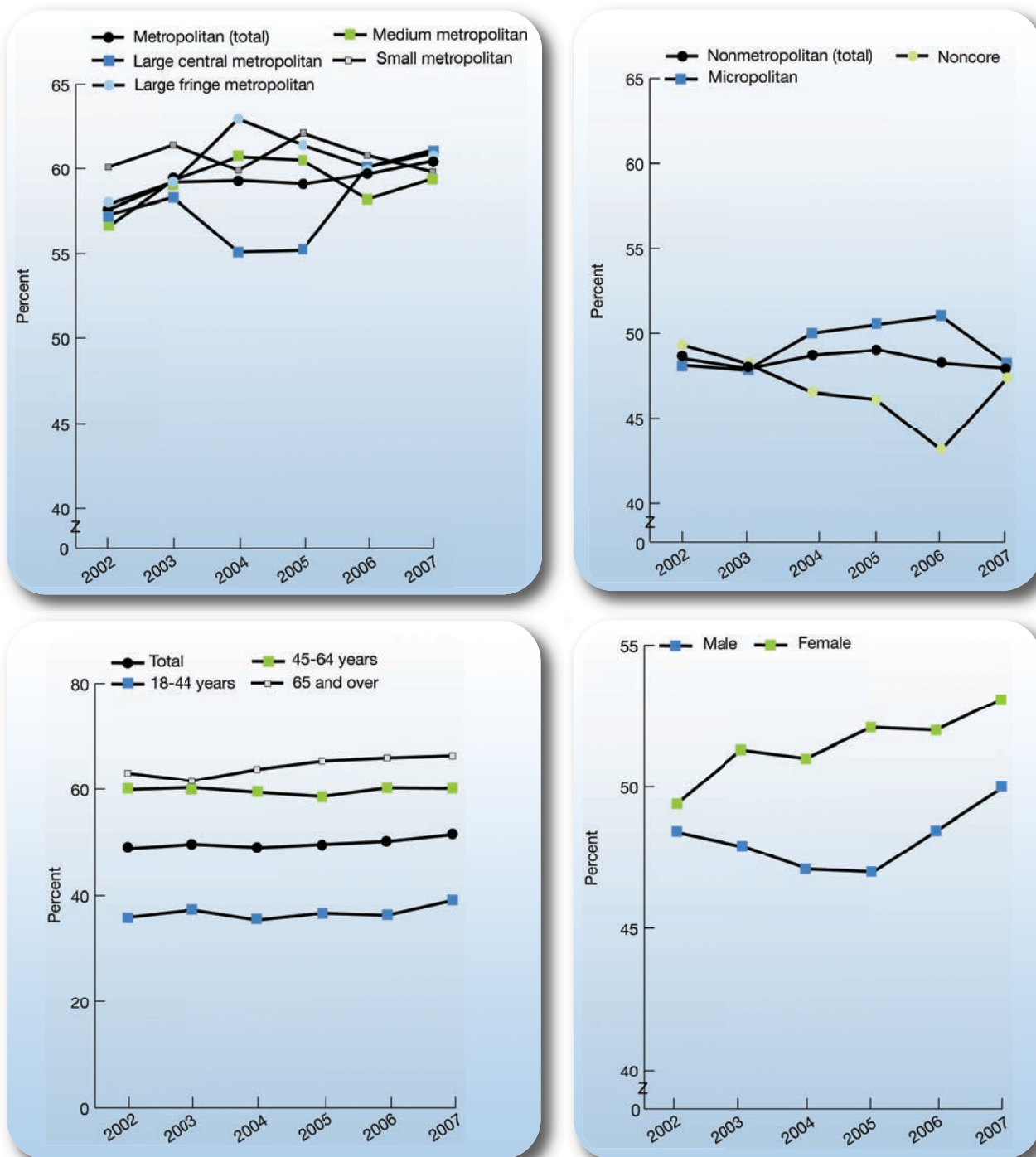
- From 2002 to 2007, the percentage of Hispanic adults with obesity who ever received advice to exercise more increased, but Hispanics were less likely than non-Hispanic Whites to ever receive advice to exercise more.
- In 2007, the percentage of obese adults who had ever received advice to exercise more was lower for poor people, low-income people, and middle-income people than for high-income people.
- In 2007, the percentage of obese adults who had ever received advice to exercise more was lower for people with less than a high school education and people with a high school education than for people with at least some college.
- In 2007, adults with obesity who spoke a language other than English at home were less likely to ever receive advice from a health provider about exercise than adults with obesity who spoke English at home.



# Effectiveness of Care

## Counseling Obese Adults About Healthy Eating

Figure 2.34. Adults with obesity who ever received advice from a health provider about eating fewer high-fat or high-cholesterol foods, by residence location, age, and gender, 2002-2007



Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2002-2007.

Denominator: Civilian noninstitutionalized population age 18 and over.

Note: Obesity is defined as a body mass index of 30 or higher.



# Effectiveness of Care

- Overall, in 2007, about 51.6% of adults with obesity received advice from a health provider about healthy eating (Figure 2.34). This improved from 2002 when 48.9% said they received this advice.
- In 2007, the percentage of adults with obesity who received advice from a health provider about healthy eating was lower for people who lived in nonmetropolitan areas than for people who lived in metropolitan areas (47.9% compared with 60.5%). There were no significant differences within metropolitan areas or nonmetropolitan areas.
- Adults with obesity ages 18-44 were least likely to receive advice about healthy eating.
- From 2002 to 2007, the percentage of adults with obesity who received advice about healthy eating improved for females. In 2007, there was no significant difference between males and females.

Also, in the NHDR:

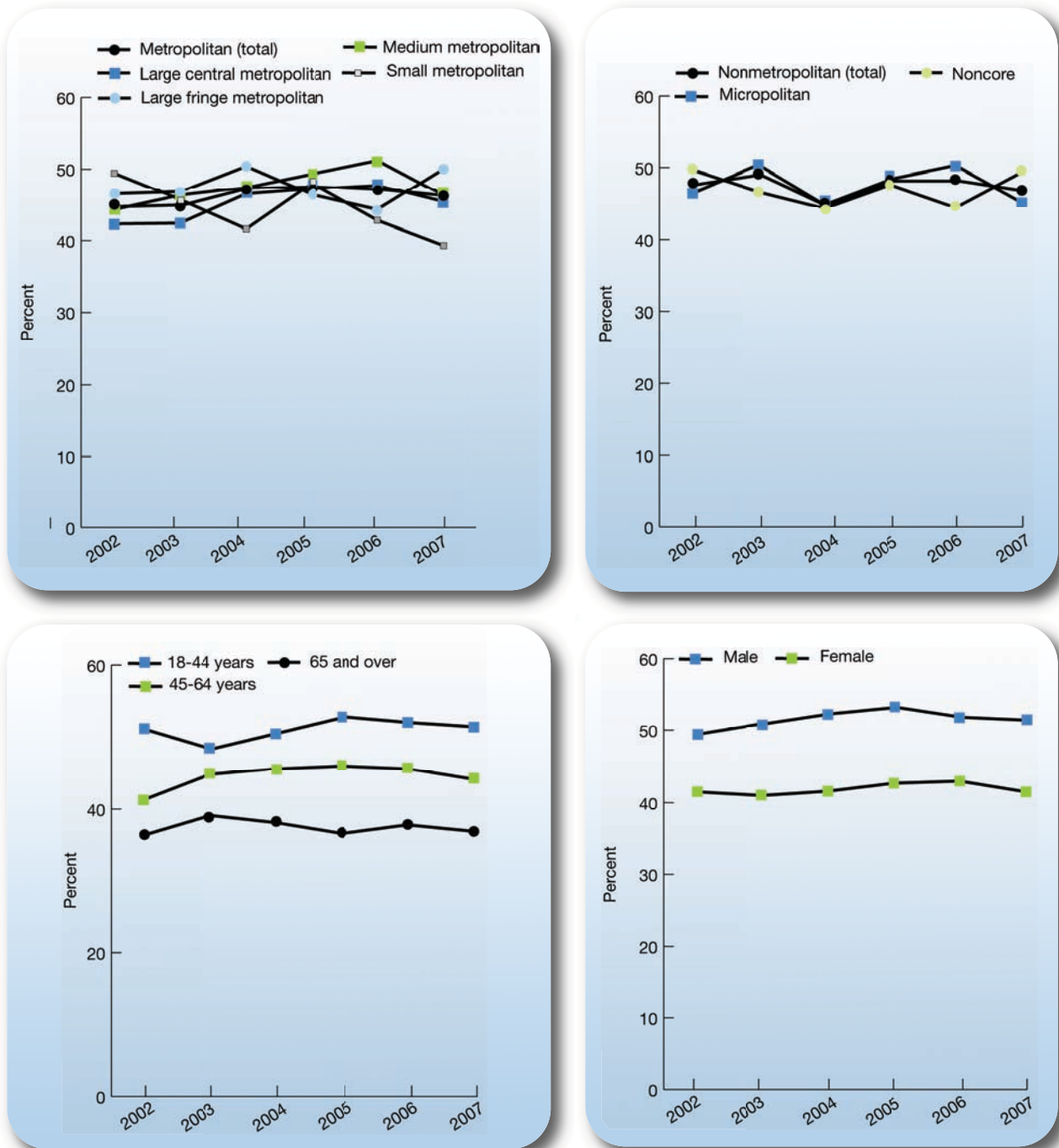
- From 2002 to 2007, the percentage of Hispanic adults with obesity who received advice from a health provider about healthy eating decreased, and Hispanics were less likely to receive this advice than non-Hispanic Whites.
- In 2007, the percentage of obese adults who received advice about eating fewer high-fat or high-cholesterol foods was significantly lower for poor, near-poor, and middle-income adults than for high-income adults.
- In 2007, the percentage of obese adults who were given advice about eating fewer high-fat or high-cholesterol foods was significantly lower for people with less than a high school education and people with a high school education than for people with some college education.
- In 2007, the percentage of adults with obesity who spoke another language at home who received advice about healthy eating was lower than it was for adults with obesity who spoke English at home.



# Effectiveness of Care

## Outcome: Obese Adults Who Exercise

Figure 2.35. Adults with obesity who spend half an hour or more in moderate or vigorous physical activity at least 3 times a week, by geographic location, age, and gender, 2002-2007



**Source:** Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2002-2007.

**Denominator:** Civilian noninstitutionalized population age 18 and over.

**Note:** Obesity is defined as a body mass index of 30 or higher.

# Effectiveness of Care

- Overall, about 46.3% of adults with obesity spent half an hour or more in moderate or vigorous activity at least 3 times a week (data not shown).
- In 2007, there were no statistically significant differences between adults with obesity living in metropolitan areas and nonmetropolitan areas overall in the percentage who exercised (Figure 2.35). However, adults with obesity in large central metropolitan areas and small metropolitan areas were less likely to exercise at least 3 times a week compared with adults with obesity in large fringe metropolitan areas (45.4% and 39.3%, respectively, compared with 50.0%).
- From 2002 to 2007, adults age 65 and over with obesity were least likely to exercise at least 3 times a week; next lowest were adults ages 45-64 with obesity (for 2007, 36.9% and 44.1%, respectively).
- From 2002 to 2007, female adults with obesity were less likely than males to exercise at least 3 times a week (for 2007, 41.5% compared with 51.4%).

Also, in the NHDR:

- From 2002 to 2007, the percentage of adults with obesity who exercised at least 3 times a week improved for non-Hispanic Blacks and Hispanics.
- Poor adults, low-income adults, and adults with less than a high school education with obesity were less likely than high-income adults to exercise as least 3 times a week.
- Adults with obesity who spoke a language other than English at home were less likely than adults who spoke English at home to exercise at least 3 times a week.

# Effectiveness of Care

## Functional Status Preservation and Rehabilitation

### Importance

#### Demographics

Noninstitutionalized adults needing help of another person with activities of daily living (ADLs) <sup>xxix</sup> (2009) .....	4.4 million <sup>94</sup>
Noninstitutionalized adults age 75 and over needing help of another person with ADLs (2009).....	10% <sup>94</sup>
Noninstitutionalized adults needing help with instrumental activities of daily living (IADLs) <sup>xxx</sup> (2009) .....	9.2 million <sup>94</sup>
Noninstitutionalized adults age 75 and over needing help with IADLs (2009) .....	20% <sup>94</sup>
Nursing home residents needing help with ADLs (2004).....	1.5 million <sup>95</sup>

#### Costs

Medicare payments for outpatient physical therapy (2006 est.) .....	\$3.1 billion <sup>96</sup>
Medicare payments for outpatient occupational therapy (2006 est.).....	\$747 million <sup>96</sup>
Medicare payments for outpatient speech-language pathology services (2006 est.).....	\$270 million <sup>96</sup>

### Measures

A person's ability to function can decline with disease or age, but it is not always an inevitable consequence. Threats to function span a wide variety of medical conditions. Services to maximize function are delivered in a variety of settings, including providers' offices, patients' homes, long-term care facilities, and hospitals. Some health care interventions can help prevent diseases that commonly cause declines in functional status. Other interventions, such as physical therapy, occupational therapy, and speech-language pathology services, can help patients regain function that has been lost or minimize the rate of decline in functioning.

The NHQR tracks several measures related to functional status preservation and rehabilitation. Three core report measures are highlighted in this section:

- Osteoporosis screening among older women.
- Improvement in ambulation among home health care patients.
- Nursing home residents needing more help with daily activities.

<sup>xxix</sup> ADLs consist of basic self-care tasks, such as bathing, dressing, eating, transferring, using the toilet, and walking.

<sup>xxx</sup> IADLs consist of tasks needed for a person to live independently, such as shopping, doing housework, preparing meals, taking medications, using the telephone, and managing money.

# Effectiveness of Care

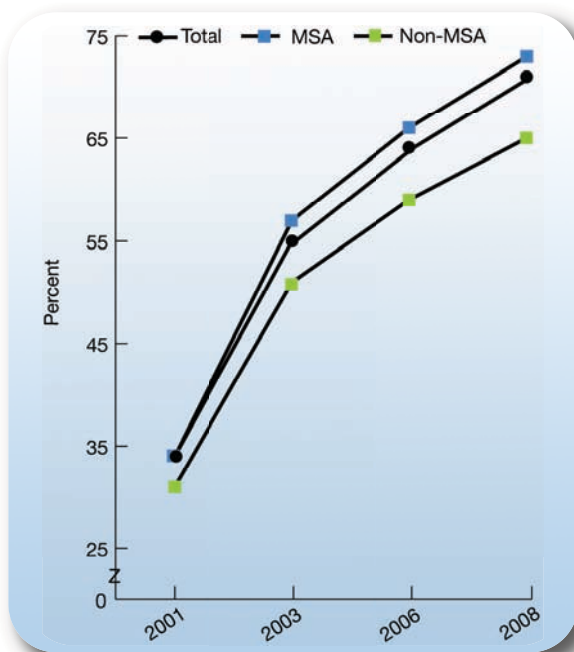
## Findings

### Prevention: Osteoporosis Screening in Women

Osteoporosis is a disease characterized by loss of bone tissue. About 10 million people in the United States have osteoporosis, and another 34 million with low bone mass are at risk for developing the disease. Osteoporosis increases the risk of fractures of the hip, spine, and wrist, and about half of all postmenopausal women will experience an osteoporotic fracture. Osteoporotic fractures cost the U.S. health care system \$17 billion each year and cause considerable morbidity and mortality. For example, of patients with hip fractures, one-fifth will die during the first year, one-third will require nursing home care, and only one-third will return to the functional status they had before the fracture. The remaining 13 percent have other outcomes.<sup>97</sup>

Because older women are at highest risk for osteoporosis, the U.S. Preventive Services Task Force recommends routine osteoporosis screening of women age 65 and over. Women with low bone density can reduce their risk of fracture and subsequent functional impairment by taking appropriate medications.<sup>98</sup>

**Figure 2.36. Female Medicare beneficiaries age 65 and over who reported ever being screened for osteoporosis with a bone mass or bone density measurement, by geographic location, 2001, 2003, 2006, and 2008**



**Key:** MSA = metropolitan statistical area.

**Source:** Medicare Current Beneficiary Survey, 2001, 2003, 2006, and 2008.

**Denominator:** Female Medicare beneficiaries age 65 and over living in the community.

- From 2001 to 2008, the percentage of female Medicare beneficiaries age 65 and over who reported ever being screened for osteoporosis with a bone mass or bone density measurement increased about 10% per year overall and among women living inside and outside metropolitan areas (Figure 2.36).
- In 2003, 2006, and 2008, the percentage of older female Medicare beneficiaries who reported ever being screened for osteoporosis was lower among those living in nonmetropolitan areas compared with those living in metropolitan areas.

# Effectiveness of Care

Also, in the NHDR:

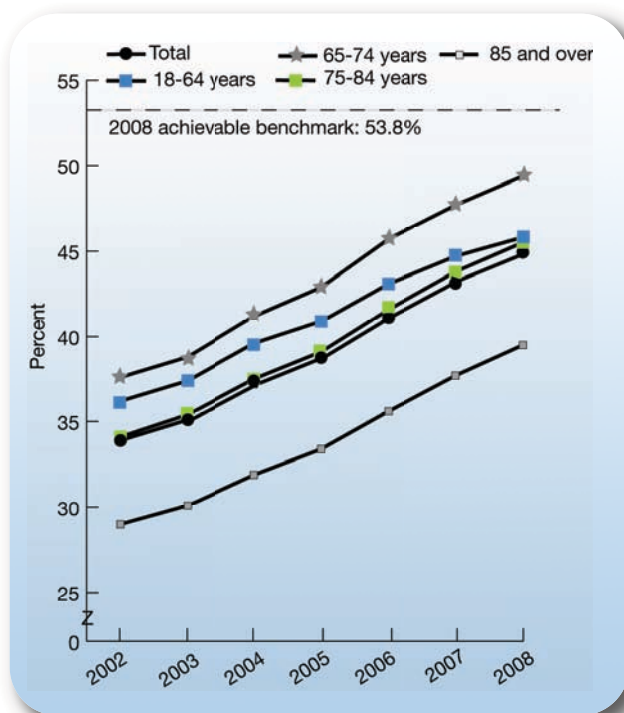
- In all years, the percentage of female Medicare beneficiaries age 65 and over who reported ever being screened for osteoporosis was significantly lower among Blacks and APIs compared with Whites and among Hispanics compared with non-Hispanic Whites.
- The percentage of female Medicare beneficiaries screened for osteoporosis was lower for poor, near-poor, and middle-income women than for high-income women.
- The percentage screened for osteoporosis also was lower for beneficiaries with three or more activity limitations than for beneficiaries with no functional limitations.

## Outcome: Improvement in Ambulation Among Home Health Care Patients

After an illness or injury, many patients receiving home health care may need temporary 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.

As patients recover from illness or injury, many experience improvements in walking and moving with a wheelchair, which can be facilitated by physical therapy. However, in cases of patients with some neurologic conditions, such as progressive multiple sclerosis or Parkinson's disease, ambulation may not improve even when the home health agency provides good care. In addition, the characteristics of patients referred to home health agencies vary across States.

**Figure 2.37. Adult home health care patients whose ability to walk or move around improved, by age, 2002-2008**



**Source:** Centers for Medicare & Medicaid Services, Outcome and Assessment Information Set (OASIS), 2002-2008.

**Denominator:** Adult nonmaternity patients completing an episode of skilled home health care and not already performing at the highest level according to the OASIS question on ambulation at the start of the episode.



# Effectiveness of Care

- From 2002 to 2008, the percentage of home health care patients who got better at walking or moving around increased for the total population (from 33.9% to 44.9%), as well as for every age group (Figure 2.37).
- In all years, patients age 85 and over were less likely to show improvement compared with patients ages 65-74. These patients may have higher levels of disability or infirmity than younger patients that make improvements in mobility harder to achieve.
- The 2008 top 5 State achievable benchmark was 53.8%.<sup>xxxi</sup> At the current 5% annual rate of increase, this benchmark could be attained overall in about 5 years.
- Rates of improvement varied by age. Patients ages 65-74 and 75-84 could attain the benchmark sooner than 5 years while patients age 85 and over would not attain the benchmark for 8 years.

Also, in the NHDR:

- Although the percentage of home health care patients who got better at walking or moving around improved for each racial and ethnic group from 2002 to 2008, rates of improvement varied. Populations with lower rates of improvement include Blacks, AI/ANs, multiple-race patients, and Hispanics.

## Outcome: Nursing Home Residents Needing More Help With Daily Activities

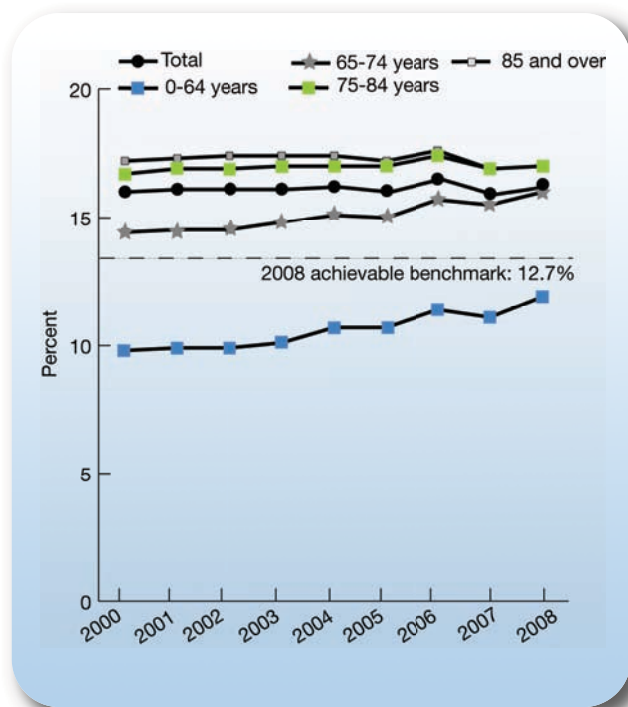
Long-stay residents enter a nursing facility typically because they can no longer care for themselves at home; they tend to remain in the facility for several months or years. While almost all long-stay nursing home residents have limitations in their ADLs, nursing home staff help residents stay as independent as possible. Most residents want to care for themselves, and the ability to perform daily activities is important to their quality of life. Some functional decline among residents cannot be avoided, but optimal nursing home care seeks to minimize the rate of decline.

---

<sup>xxxi</sup> The top 5 States contributing to the achievable benchmark are District of Columbia, Hawaii, Kansas, South Carolina, and Utah.

# Effectiveness of Care

**Figure 2.38. Long-stay nursing home residents whose need for help with daily activities increased, by age, 2000-2008**



**Source:** Centers for Medicare & Medicaid Services, Minimum Data Set, 2000-2008. Data are from the third quarter of each calendar year.

**Denominator:** All long-stay residents in Medicare or Medicaid certified nursing home facilities.

- In 2008, 16.2% of long-stay nursing home residents had increased need for help with daily activities (Figure 2.38). The overall percentage of long-stay nursing home residents who needed help with daily activities did not change between 2000 and 2008. The rate increased among residents ages 0-64 and ages 65-74.
- In all years, residents ages 0-64 were less likely to need increasing help with daily activities compared with residents ages 65-74. Before 2007, residents ages 75-84 and age 85 and over were significantly more likely to need increasing help with daily activities compared with residents ages 65-74.
- The 2008 top 5 State achievable benchmark was 12.7%.<sup>xxxiii</sup> In 2008, residents ages 0-64 had rates better (lower) than the benchmark; however, their rates were increasing over time. There was no evidence that the overall rate or rates for other age groups were getting closer to the benchmark.

Also, in the NHDR:

- API, AI/AN, and Hispanic residents were less likely to need increasing help with daily activities compared with Whites.

<sup>xxxiii</sup> The top 5 States that contributed to the achievable benchmark are Alabama, Alaska, New Jersey, Oklahoma, and Oregon.

# Effectiveness of Care

## Supportive and Palliative Care

### Importance

#### Demographics

Number of nursing home residents ever admitted during the calendar year (2007) .....	3,196,310 <sup>99</sup>
Number of Medicare fee-for-service (FFS) home health patients <sup>xxxiii</sup> (2006) .....	3,031,814 <sup>100</sup>
Number of Medicare FFS beneficiaries using Medicare hospice services (2006) .....	935,565 <sup>101</sup>

#### Cost

Total costs of nursing home care <sup>xxxiv</sup> (2007 est.) .....	\$131.3 billion <sup>102</sup>
Total costs of home health care <sup>xxxiv</sup> (2007 est.) .....	\$59.0 billion <sup>102</sup>
Medicare FFS payments for hospice services (2008 est.) .....	\$11.2 billion <sup>103</sup>

### Measures

Disease cannot always be cured, and disability cannot always be reversed. For patients with long-term health conditions, managing symptoms and preventing complications are important goals. Supportive and palliative care cuts across many medical conditions and is delivered by many health care providers. Supportive and palliative care focuses on enhancing patient comfort and quality of life and preventing and relieving symptoms and complications. Toward the end of life, hospice care provides patients and families with practical, emotional, and spiritual support to help cope with death and bereavement. Honoring patient values and preferences for care is also critical.<sup>104</sup>

The National Priorities Partnership (NPP) identified palliative and end-of-life care as one of six national priorities.<sup>105</sup> The vision is health care “capable of promising dignity, comfort, companionship, and spiritual support to patients and families facing advanced illness or dying.” Key goals include relief of suffering, help with emotional and spiritual needs, effective communication about options for care, and high-quality hospice services.

The NHQR tracks several measures of supportive and palliative care delivered by home health agencies, nursing homes, and hospices. The 6 supporting measures, which are organized around the NPP goals, include:

<sup>xxxiii</sup> Medicare FFS patients represent only a portion of all home health patients.

<sup>xxxiv</sup> Cost estimates for nursing home and home health services include only costs for freestanding skilled nursing facilities, nursing homes, and home health agencies and not those that are hospital based.

# Effectiveness of Care

- Relief of suffering
  - Shortness of breath among home health care patients
  - Pressure sores in nursing home residents
- Help with emotional and spiritual needs
  - Right amount of emotional support among hospice patients
- Effective communication
  - Enough information about what to expect among hospice family caregivers
- High-quality palliative services
  - Care consistent with patient's wishes among hospice patients
  - Availability of nonhospice palliative care

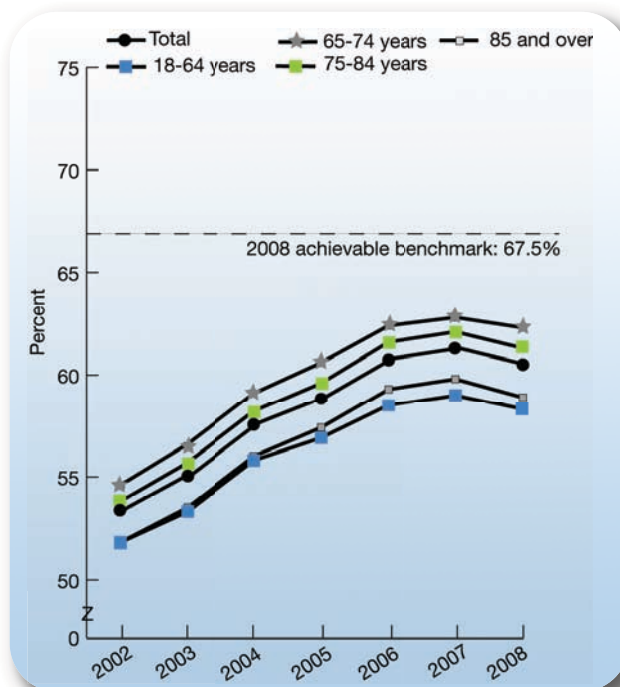
## Findings

### Relief of Suffering

#### Outcome: Shortness of Breath Among Home Health Care Patients

Shortness of breath is uncomfortable. Many patients with heart or lung problems experience difficulty breathing and may tire easily or be unable to perform daily activities. Doctors and home health staff should monitor shortness of breath and may give advice, therapy, medication, or oxygen to help lessen this symptom.

**Figure 2.39. Adult home health care patients who had less shortness of breath between the start and end of a home health care episode, by age, 2002-2008**



**Source:** Centers for Medicare & Medicaid Services, Outcome and Assessment Information Set, 2002-2008.

**Denominator:** Adult nonmaternity patients completing an episode of skilled home health care.

# Effectiveness of Care

- Between 2002 and 2008, the percentage of adult home health care patients overall who had less shortness of breath increased from 53.3% to 60.5% (Figure 2.39), as well as for every age group.
- From 2006 to 2008, patients ages 18-64 years were significantly less likely than patients ages 65-74 to have experienced less shortness of breath. Medicare patients under age 65 are usually disabled or have ESRD.
- The 2008 top 5 State achievable benchmark was 67.5%.<sup>xxxv</sup> At the current 2% annual rate of increase, this benchmark could be attained overall in about 5 years. Patients ages 65-74 and 75-84 could attain the benchmark sooner than 5 years while patients ages 18-64 and age 85 and over would not attain the benchmark for between 6 and 8 years.

Also, in the NHDR:

- Between 2002 and 2008, the percentage of adult home health care patients who had less shortness of breath increased for each racial and ethnic group.
- Populations with lower rates of improvement include Blacks, AI/ANs, and Hispanics.

## Outcome: Pressure Sores in Nursing Home Residents

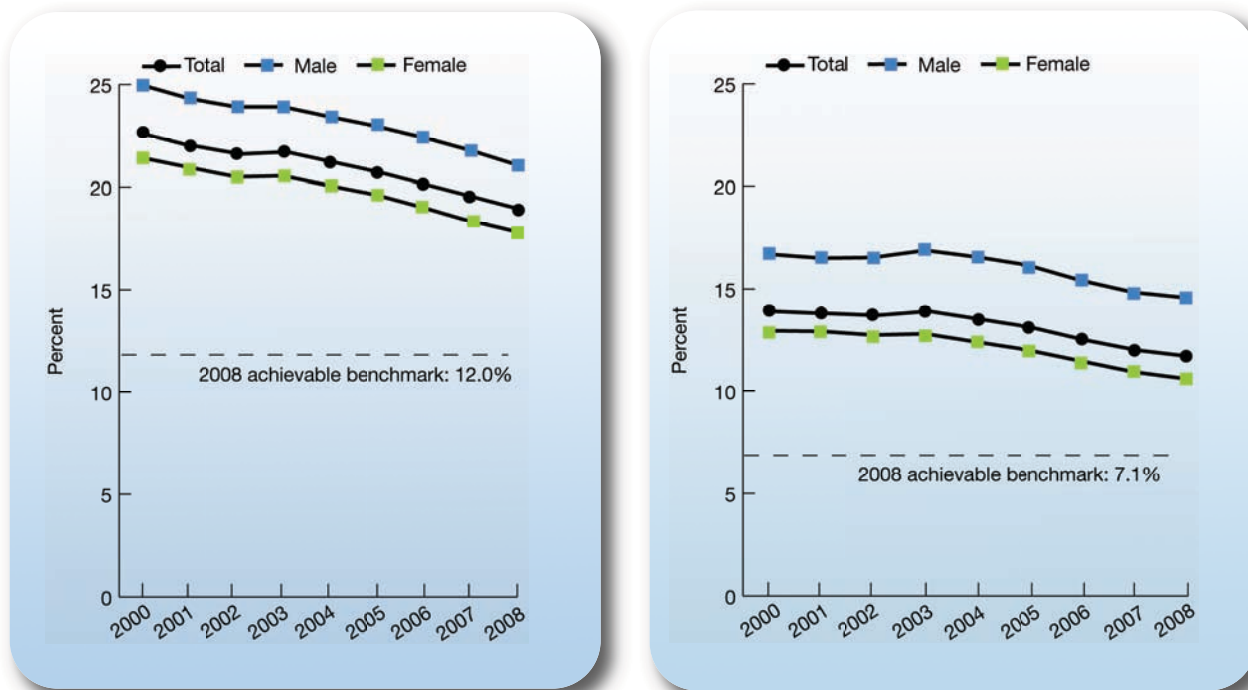
A pressure ulcer, or pressure sore, is an area of broken-down skin caused by sitting or lying in one position for an extended time and can be very painful. Residents should be assessed by nursing home staff for presence or risk of developing pressure sores. Nursing homes can help to prevent or heal pressure sores by keeping residents clean and dry and by changing their position frequently or helping them move around. Other interventions include making sure residents get proper nutrition and using soft padding to reduce pressure on the skin. However, some residents may get pressure sores even when a nursing home provides good preventive care.

---

<sup>xxxv</sup> The top 5 States contributing to the achievable benchmark are Georgia, Hawaii, New Jersey, Rhode Island, and South Carolina.

# Effectiveness of Care

**Figure 2.40. Short-stay (left) and high-risk long-stay (right) nursing home residents with pressure sores, by gender, 2000-2008**



**Source:** Centers for Medicare & Medicaid Services, Minimum Data Set, 2000-2008. Data for long-stay residents are from the third quarter of each calendar year. Data for short-stay residents are full calendar-year estimates.

**Denominator:** Short-stay and high-risk long-stay nursing home residents in Medicare or Medicaid certified nursing and long-term care facilities.

- From 2000 to 2008, the rate of short-stay residents with pressure sores fell from 22.6% to 18.9% (Figure 2.40).<sup>xxxvi</sup> For high-risk long-stay residents, the rate fell from 13.9% to 11.7%.<sup>xxxvii</sup> Improvements included rates for both males and females.
- Short-stay residents have higher rates of pressure sores. Some of these patients may be admitted to nursing homes because of sores acquired during an acute care hospitalization.
- In all years, males were more likely than females to have pressure sores.
- The 2008 top 5 State achievable benchmark for short-stay residents was 12.0%.<sup>xxxviii</sup> At the current 2% annual rate of decrease, this benchmark could be attained overall in about 16 years. Females could attain this rate in 13 years while males would need 20 years.

<sup>xxxvi</sup> Short-stay residents stay fewer than 30 days in a nursing home, typically following an acute care hospitalization.

<sup>xxxvii</sup> Long-stay residents enter a nursing facility typically because they can no longer care for themselves at home. They tend to remain in the facility for several months or years. High-risk residents are those who are in a coma, do not get the nutrients needed to maintain skin health, or cannot change position on their own.

<sup>xxxviii</sup> The top 5 States that contributed to the achievable benchmark are Colorado, Iowa, Minnesota, Nebraska, and Utah.



# Effectiveness of Care

- The 2008 top 5 State achievable benchmark for high-risk long-stay residents was 7.1%.<sup>xxxix</sup> At the current 2% annual rate of decrease, this benchmark could be attained overall in about 16 years. Females could attain this rate in 11 years; males would need 27 years.

Also, in the NHDR:

- Groups with slow rates of improvement include APIs, AI/ANs, and Hispanics.

## Help With Emotional and Spiritual Needs

Hospice care is generally delivered at the end of life to patients with a terminal illness or condition who desire palliative medical care; it also includes practical, psychosocial, and spiritual support for the patient and family. The goal of end-of-life care is to achieve a “good death,” defined by the IOM as one that is “free from avoidable distress and suffering for patients, families, and caregivers; in general accord with the patients’ and families’ wishes; and reasonably consistent with clinical, cultural, and ethical standards.”<sup>106</sup>

The National Hospice and Palliative Care Organization’s Family Evaluation of Hospice Care survey examines the quality of hospice care for dying patients and their family members. Family respondents report how well hospices respect patients’ wishes, communicate about illness, control symptoms, support dying on one’s own terms, and provide family emotional support.<sup>107, xi</sup>

## Management: Right Amount of Emotional Support

Dying is a stressful process. Patients at the end of life may develop depression or anxiety disorders. Health care systems and providers need to be attuned to recognizing and responding to the emotional and spiritual needs of patients with life-limiting illness and their families.

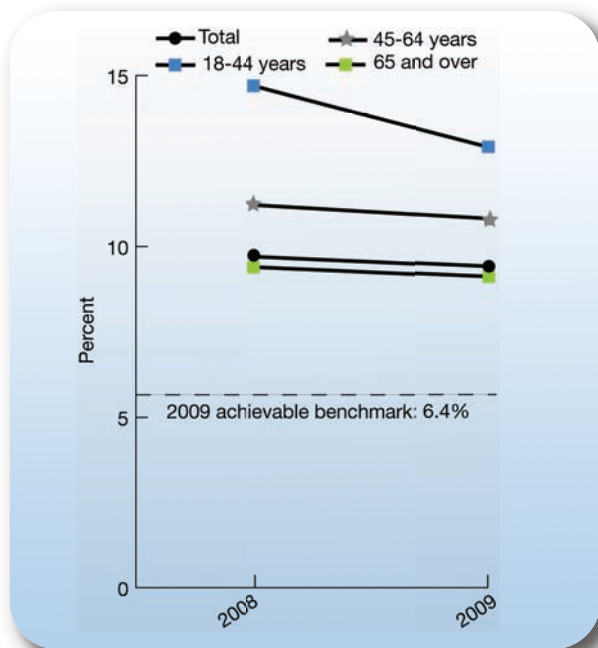
---

<sup>xxxix</sup> The top 5 States that contributed to the achievable benchmark are Hawaii, Minnesota, Nebraska, New Hampshire, and North Dakota.

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

# Effectiveness of Care

**Figure 2.41. Hospice patients age 18 and over who did NOT receive the right amount of help for feelings of anxiety or sadness, by age, 2008-2009**



**Source:** National Hospice and Palliative Care Organization, Family Evaluation of Hospice Care, 2008-2009.  
**Denominator:** Adult hospice patients.

- The percentage of hospice patients whose families reported that they did not receive the right amount of help for feelings of anxiety or sadness was 9.4% in 2009 (Figure 2.41).
- In all years, hospice patients ages 18-44 and ages 45-64 were less likely than patients age 65 and over to receive the right amount of emotional support.
- The 2009 top 5 State achievable benchmark was 6.4%.<sup>xli</sup> Data are insufficient to assess progress toward this goal.

Also, in the NHDR:

- In all years, Blacks, APIs, AI/ANs, and Hispanics were less likely than Whites to receive the right amount of emotional support.

## Effective Communication

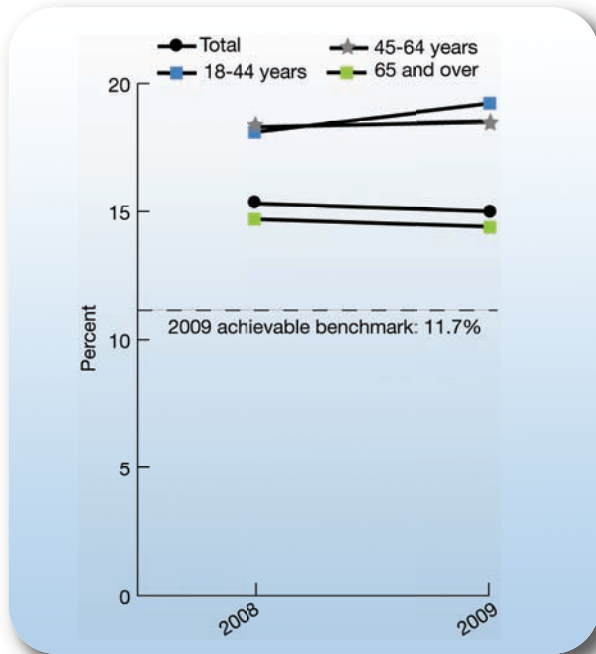
### Management: Enough Information About What To Expect

Patients at the end of life and their families need clear information about treatment options, prognosis, advance directives, and what to expect while the patient is dying. Health care providers need to be skilled at eliciting patients' values and preferences, accepting of different cultural and religious choices, and committed to continuing care regardless of patient treatment decisions.

<sup>xli</sup> The top 5 States that contributed to the achievable benchmark are Alabama, Arkansas, Kansas, Rhode Island, and South Carolina.

# Effectiveness of Care

Figure 2.42. Hospice patients age 18 and over whose family caregivers wanted more information about what to expect while the patient was dying, by age, 2008-2009



Source: National Hospice and Palliative Care Organization, Family Evaluation of Hospice Care, 2008-2009.

Denominator: Adult hospice patients.

- The percentage of hospice patient family caregivers who reported that they wanted more information about what to expect while the patient was dying was 15% in 2009 (Figure 2.42).
- In all years, family caregivers of hospice patients ages 18-44 and ages 45-64 were more likely than family caregivers of patients age 65 and over to want more information about dying.
- The 2009 top 5 State achievable benchmark was 11.7%.<sup>xliii</sup> Data are insufficient to assess progress toward this goal.

Also, in the NHDR:

- In all years, family caregivers of API, AI/AN, and Hispanic patients were more likely than family caregivers of White patients to want more information about dying.
- Family caregivers of male hospice patients were more likely than family caregivers of female patients to want more information about dying.

<sup>xliii</sup> The top 5 States contributing to the achievable benchmark are Iowa, Kansas, Kentucky, Nebraska, and West Virginia.

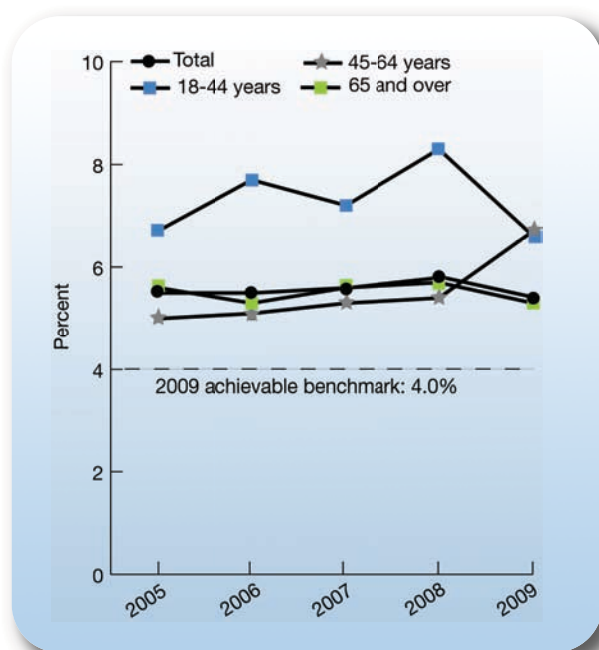
# Effectiveness of Care

## High-Quality Palliative Services

### Management: Care Consistent With Patient's Wishes

Hospice care should respect patients' stated goals for care. This includes shared communication and decisionmaking between providers and hospice patients and their family members and respect for cultural and religious beliefs.

**Figure 2.43. Hospice patients age 18 and over who did NOT receive care consistent with their stated end-of-life wishes, by age, 2005-2009**



**Source:** National Hospice and Palliative Care Organization, Family Evaluation of Hospice Care, 2005-2009.

**Denominator:** Adult hospice patients.

- The percentage of hospice patients whose families reported that they did not receive end-of-life care consistent with their stated wishes was 5.4% in 2009 (Figure 2.43).
- In 2009, there were no significant differences for hospice patients among age groups in receiving end-of-life care consistent with their wishes.

### Structure: Availability of Palliative and Hospice Care

Use of hospice care services varies widely across the Nation. For example, among Medicare beneficiaries age 65 and over who died in 2002, the percentage who had received hospice care in the year prior to death varied from 8% in Alaska and 14% in Maine to 45% in Colorado and 49% in Arizona.<sup>108</sup>

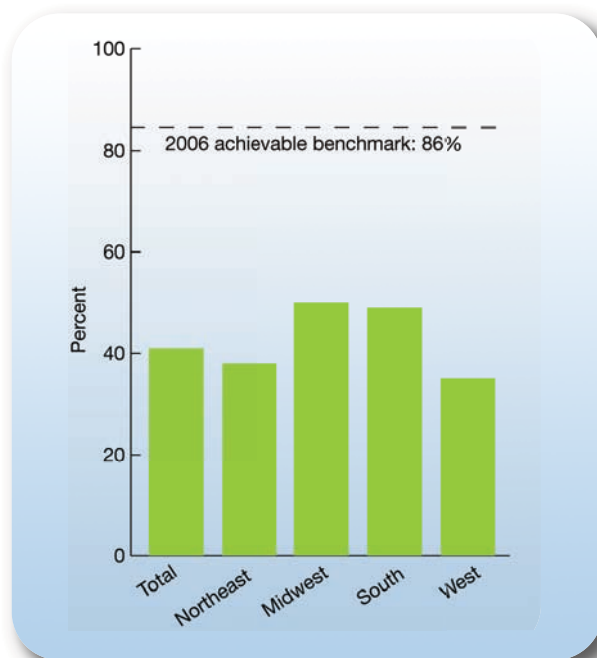
Rates of disenrollment from hospice prior to death also vary geographically. Among hospices serving Medicare patients with terminal cancer, the average hospice disenrollment rate was 15% and rates varied

# Effectiveness of Care

from 11% in the East North Central region of the country to 21% in the East South Central region.<sup>109</sup> Patients who disenroll from hospice are more likely to be admitted to an emergency room, hospital, or intensive care unit and to die in the hospital. They incur expenditures between hospice enrollment and death that average \$30,848 per person compared with \$6,537 for patients that stay with hospice.<sup>110</sup>

Use of palliative care services independent of hospice or use of nonhospice palliative care services is affected by the availability of palliative care providers. Hospitals are critical providers of palliative care. The Center to Advance Palliative Care and the National Palliative Care Research Center have developed a methodology to measure the availability of hospital-based palliative care. This method tracks the percentage of mid-size and large hospitals (50 or more beds) that reported having a palliative care program in the American Hospital Association Annual Survey. Results from their 2008 report on geographic variation in availability of hospital palliative care are presented below.<sup>111</sup>

**Figure 2.44. Mid-size and large hospitals with palliative care program, by region, 2006**



**Source:** Center to Advance Palliative Care analyses of 2006 American Hospital Association Annual Survey.

**Denominator:** Mid-size and large hospitals (50 or more beds).

- The percentage of mid-size and large hospitals who report palliative care programs in 2006 ranged from 35% in the West to 50% in the Midwest.
- The 2006 top 5 State achievable benchmark was 86%.<sup>xliii</sup>

<sup>xliii</sup> The top 5 States that contributed to the achievable benchmark are Montana, New Hampshire, South Dakota, Vermont, and the District of Columbia.

## References

1. Xu J, Kochanek K, Murphy S, et al. Deaths: final data for 2007. *Natl Vital Stat Rep* 2010 May 20;58(19). Available at: [www.cdc.gov/nchs/data/nvsr/nvsr58/nvsr58\\_19.pdf](http://www.cdc.gov/nchs/data/nvsr/nvsr58/nvsr58_19.pdf). Accessed November 12, 2010.
2. National Cancer Institute, Statistical Research and Application Branch, Surveillance Research Program, SEER Program. U.S. estimated prevalence counts on 1/1/2007. Cancer Query System: Cancer Prevalence Database. Available at: <http://srab.cancer.gov/prevalence/canques.html>. Accessed November 14, 2008.
3. American Cancer Society. Cancer facts & figures 2010. Atlanta, GA: American Cancer Society; 2010. Available at: [www.cancer.org/acs/groups/content/@nho/documents/document/acspc-024113.pdf](http://www.cancer.org/acs/groups/content/@nho/documents/document/acspc-024113.pdf). Accessed October 25, 2010.
4. National Heart, Lung, and Blood Institute. Fact book fiscal year 2009. Bethesda, MD: National Institutes of Health; 2009. Available at: [www.nhlbi.nih.gov/about/FactBook2009\\_final.pdf](http://www.nhlbi.nih.gov/about/FactBook2009_final.pdf). Accessed December 29, 2010.
5. Maciosek MV, Coffield AB, Edwards NM, et al. Priorities among effective clinical preventive services: results of a systematic review and analysis. *Am J Prev Med* 2006 Jul;31(1):52-61.
6. What is cancer screening? Bethesda, MD: National Cancer Institute; September 20, 2010. Available at: [www.cancer.gov/cancertopics/pdq/screening/overview](http://www.cancer.gov/cancertopics/pdq/screening/overview). Accessed October 25, 2010.
7. Centers for Disease Control and Prevention. National diabetes fact sheet: general information and national estimates on diabetes in the United States, 2007. Atlanta, GA: Centers for Disease Control and Prevention; 2008. Available at: [www.cdc.gov/diabetes/pubs/estimates07.htm](http://www.cdc.gov/diabetes/pubs/estimates07.htm). Accessed June 30, 2008.
8. National Center for Chronic Disease Prevention and Health Promotion. Diabetes: successes and opportunities for population-based prevention and control: at a glance 2009. Atlanta, GA: Centers for Disease Control and Prevention; 2009. Available at: [www.cdc.gov/nccdphp/publications/aag/pdf/diabetes.pdf](http://www.cdc.gov/nccdphp/publications/aag/pdf/diabetes.pdf). Accessed November 14, 2008.
9. Standards of medical care in diabetes—2010. *Diabetes Care* Jan;33 Suppl 1:S11-61.
10. Diabetes data and trends. Distribution of first-listed diagnoses among hospital discharges with diabetes as any listed diagnosis, adults age 18 years or older, United States, 2006. Atlanta, GA: Centers for Disease Control and Prevention; 2009. Available at: [www.cdc.gov/diabetes/statistics/hosp/adulttable1.htm](http://www.cdc.gov/diabetes/statistics/hosp/adulttable1.htm). Accessed October 25, 2010.
11. Fishbein H, Palumbo P. Acute metabolic complications in diabetes. Bethesda, MD: National Institute of Diabetes and Digestive and Kidney Diseases; 1995. Available at: <http://diabetes.niddk.nih.gov/dm/pubs/America/citation.htm>. Accessed October 25, 2010.
12. 2007 national diabetes fact sheet: general information and national estimates on diabetes in the United States. Atlanta, GA: Centers for Disease Control and Prevention; 2008. Available at: [www.cdc.gov/diabetes/pubs/factsheet07.htm](http://www.cdc.gov/diabetes/pubs/factsheet07.htm). Accessed June 30, 2008.
13. U.S. Renal Data System. USRDS 2009 annual data report: atlas of chronic kidney disease and end-stage renal disease in the United States. Bethesda, MD: National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases; 2009. Available at: [www.usrds.org/adr.htm](http://www.usrds.org/adr.htm). Accessed December 22, 2009.
14. Health, United States, 2010, with special features on death and dying. Hyattsville, MD: National Center for Health Statistics; 2011. DHHS Pub. No. 2011-1232. Available at: [www.cdc.gov/nchs/hus.htm](http://www.cdc.gov/nchs/hus.htm). Accessed March 8, 2011.
15. Healthcare Systems Bureau, Division of Transplantation. 2007 annual report of the U.S. Organ Procurement and Transplantation Network and Scientific Registry of Transplant Recipients: transplant data 1997-2006. Rockville, MD: Health Resources and Services Administration; 2007. Available at: <http://optn.transplant.hrsa.gov/data/annualreport.asp>. Accessed November 3, 2008.
16. Healthcare Systems Bureau, Division of Transplantation. 2008 annual report of the U.S. Organ Procurement and Transplantation Network and the Scientific Registry of Transplant Recipients: transplant data 1998-2007. Rockville, MD: Health Resources and Services Administration; 2008. Available at: <http://optn.transplant.hrsa.gov/data/annualreport.asp>. Accessed November 3, 2009.
17. Lloyd-Jones D, Adams RJ, Brown TM, et al. Heart disease and stroke statistics—2010 update: a report from the American Heart Association. *Circulation* Feb 23;121(7):e46-215.



# Effectiveness of Care

18. Rosamond W, Flegal K, Friday G, et al. Heart disease and stroke statistics—2007 update: a report from the American Heart Association Statistics Committee and Stroke Statistics Subcommittee. *Circulation* 2007 Feb 6;115(5):e69-171.
19. HIV surveillance report, 2008. Atlanta, GA: Centers for Disease Control and Prevention; 2010. Available at: [www.cdc.gov/hiv/topics/surveillance/resources/reports/](http://www.cdc.gov/hiv/topics/surveillance/resources/reports/). Accessed November 21, 2010.
20. The Henry J. Kaiser Family Foundation. HIV/AIDS policy fact sheet. Menlo Park, CA: Henry J. Kaiser Family Foundation; 2010. Available at: [www.kff.org/hivaids/upload/7029-06.pdf](http://www.kff.org/hivaids/upload/7029-06.pdf). Accessed November 21, 2010.
21. Shapiro MF, Morton SC, McCaffrey DF, et al. Variations in the care of HIV-infected adults in the United States: results from the HIV Cost and Services Utilization Study. *Jama* 1999 Jun 23-30;281(24):2305-15.
22. HIV/AIDS among African Americans [Web site]. Atlanta, GA: Centers for Disease Control and Prevention; September 2010. Available at: [www.cdc.gov/hiv/topics/aa/index.htm](http://www.cdc.gov/hiv/topics/aa/index.htm).
23. Centers for Disease Control and Prevention. Diagnoses of HIV infection and AIDS in the United States and dependent areas, 2008. Atlanta, GA: Centers for Disease Control and Prevention; 2008. Available at: [www.cdc.gov/hiv/surveillance/resources/reports/2008report/index.htm](http://www.cdc.gov/hiv/surveillance/resources/reports/2008report/index.htm).
24. HIV/AIDS among Hispanics/Latinos. Atlanta, GA: Centers for Disease Control and Prevention; 2009. Available at: [www.cdc.gov/hiv/hispanics/resources/factsheets/hispanic.htm](http://www.cdc.gov/hiv/hispanics/resources/factsheets/hispanic.htm). Accessed December 22, 2009.
25. Carrillo H, DeCarlo, P. What are the HIV prevention needs of Mexican immigrants in the U.S.? San Francisco, CA: University of California Center for AIDS Prevention Studies; 2003. Available at: [www.caps.ucsf.edu/pubs/FS/mexicans.php](http://www.caps.ucsf.edu/pubs/FS/mexicans.php). Accessed December 22, 2009.
26. Centers for Disease Control and Prevention. WISQARS [Web-based Injury Statistics Query and Reporting System] leading causes of death reports. Available at: <http://webappa.cdc.gov/sasweb/ncipc/leadcaus10.html>. Accessed December 22, 2009.
27. Turner BJ, Cunningham WE, Duan N, et al. Delayed medical care after diagnosis in a U.S. national probability sample of persons infected with human immunodeficiency virus. *Arch Intern Med* 2000 Sep 25;160(17):2614-22.
28. Health Resources and Services Administration. The HIV/AIDS Program: HAB performance measures. Available at: <http://hab.hrsa.gov/special/habmeasures.htm#performance1>. Accessed October 25, 2010.
29. Yeargin P, Donnelly R, Weyer D, et al. Clinical management of the HIV-infected adult: a manual for midlevel clinicians. Atlanta, GA: Southeast AIDS Training and Education Center; 2003. Available at: [www.seatec.emory.edu/clinicalprotocols/clinical\\_protocols\\_manual2003.pdf](http://www.seatec.emory.edu/clinicalprotocols/clinical_protocols_manual2003.pdf). Accessed May 8, 2006.
30. Centers for Disease Control and Prevention. HIV prevention in the third decade. Atlanta, GA: Centers for Disease Control and Prevention; 2005. Available at: <http://www.cdc.gov/hiv/resources/reports/hiv3rddecade/index.htm>. Accessed October 26, 2010.
31. 2007 American Community Survey 1-year estimates, Table S0901, children characteristics. Suitland, MD: U.S. Census Bureau; 2007. Available at: [http://factfinder.census.gov/servlet/STTable?\\_bm=y&-qr\\_name=ACS\\_2007\\_1YR\\_G00\\_S0901&-geo\\_id=01000US&-ds\\_name=ACS\\_2007\\_1YR\\_G00\\_&-\\_lang=en&-redoLog=false](http://factfinder.census.gov/servlet/STTable?_bm=y&-qr_name=ACS_2007_1YR_G00_S0901&-geo_id=01000US&-ds_name=ACS_2007_1YR_G00_&-_lang=en&-redoLog=false). Accessed March 10, 2009.
32. Martin J, Hamilton B, Sutton P, et al. Births: final data for 2007. Hyattsville, MD: National Center for Health Statistics; 2010. Available at: [www.cdc.gov/nchs/data/nvsr/nvsr58/nvsr58\\_24.pdf](http://www.cdc.gov/nchs/data/nvsr/nvsr58/nvsr58_24.pdf). Accessed November 16, 2010.
33. 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: Agency for Healthcare Research and Quality; 2005.
34. Schwartz N, Seubert DE, Mierlak J, et al. Predictors of severe perineal lacerations in Chinese women. *J Perinat Med* 2009;37(2):109-13.
35. Kudish B, Sokol RJ, Kruger M. Trends in major modifiable risk factors for severe perineal trauma, 1996-2006. *Int J Gynaecol Obstet* 2008 Aug;102(2):165-70.
36. Ogden CL, Flegal KM, Carroll MD, et al. Prevalence and trends in overweight among U.S. children and adolescents, 1999-2000. *Jama* 2002 Oct 9;288(14):1728-32.
37. Ogden CL, Carroll MD, Flegal KM. High body mass index for age among U.S. children and adolescents, 2003-2006. *Jama* 2008 May 28;299(20):2401-5.

# Effectiveness of Care

38. Krebs NF, Jacobson MS. Prevention of pediatric overweight and obesity. *Pediatrics* 2003 Aug;112(2):424-30.
39. Centers for Disease Control and Prevention. Children and teens told by doctors that they were overweight—United States, 1999-2002 MMWR 2005 Sep 54(34):848-9.
40. National Center for Statistics and Analysis. 2007 traffic safety annual assessment—alcohol-related fatalities. Washington, DC: U.S. Department of Transportation, National Highway Traffic Safety Administration; 2008. Available at: <http://www-nrd.nhtsa.dot.gov/Pubs/811016.PDF>. Accessed April 6, 2009.
41. Office of Applied Studies. Results from the 2008 National Survey on Drug Use and Health: national findings. Rockville, MD: Substance Abuse and Mental Health Services Administration; 2008. Publication No. 08-4343. NSDUH Series H-34. Available at: [www.oas.samhsa.gov/nsduh/2k7nsduh/2k7results.pdf](http://www.oas.samhsa.gov/nsduh/2k7nsduh/2k7results.pdf). Accessed April 6, 2009.
42. Office of Applied Studies. Results from the 2006 National Survey on Drug Use and Health: national findings. Rockville, MD: Substance Abuse and Mental Health Services Administration; 2006. Available at: [www.oas.samhsa.gov/nsduh/2k6nsduh/2k6results.pdf](http://www.oas.samhsa.gov/nsduh/2k6nsduh/2k6results.pdf). Accessed March 27, 2008.
43. Mark T, Levit K, Coffey R, et al. National expenditures for mental health services and substance abuse treatment, 1993-2003. Rockville, MD: Substance Abuse and Mental Health Services Administration; 2007. Publication No. SMA 07-4227. Available at: <http://www.samhsa.gov/spendingestimates/SAMHSFINAL9303.pdf>. Accessed November 14, 2008.
44. Owens P, Mutter RL, Stocks C. Mental health and substance abuse-related emergency department visits among adults, 2007. Rockville, MD: Agency for Healthcare Research and Quality; 2010. Available at: <http://www.hcup-us.ahrq.gov/reports/statbriefs/sb92.pdf>. Accessed October 26, 2010.
45. Saba D, Levit K, Elixhauser A. Hospital stays related to mental health, 2006. Rockville, MD: Agency for Healthcare Research and Quality; 2008. Available at: <http://www.hcup-us.ahrq.gov/reports/statbriefs/sb62.pdf>. Accessed October 26, 2010.
46. Center for Mental Health Services. Mental health: culture, race, and ethnicity—a supplement to Mental Health: A Report of the Surgeon General. Rockville, MD: Substance Abuse and Mental Health Services Administration; 2001. Available at: [www.surgeongeneral.gov/library/mentalhealth/cre/sma-01-3613.pdf](http://www.surgeongeneral.gov/library/mentalhealth/cre/sma-01-3613.pdf). Accessed November 3, 2008.
47. Shortage designation: HPSAs, MUAs, & MUPs. Rockville, MD: Health Resources and Services Administration; 2009. Available at: <http://bhpr.hrsa.gov/shortage/>. Accessed December 21, 2009.
48. Insel TR, Wang PS. The STAR\*D trial: revealing the need for better treatments. *Psychiatr Serv* 2009 Nov;60(11):1466-7.
49. Rosack J. STAR\*D findings may guide treatment recommendations. *Psychiatr News* 41(2): 1; 2006.
50. Rosack J. Evidence-based sequence improves depression outcome. *Psychiatr News* 2006;41(18):19.
51. Bower P, Byford S, Barber J, et al. Meta-analysis of data on costs from trials of counselling in primary care: using individual patient data to overcome sample size limitations in economic analyses. *BMJ* 2003 Jun 7;326(7401):1247-50.
52. Bower P, Rowland N. Effectiveness and cost effectiveness of counselling in primary care. *Cochrane Database Syst Rev* 2006(3):CD001025.
53. Glied S, Herzog K, Frank R. Review: the net benefits of depression management in primary care. *Med Care Res Rev* Jun;67(3):251-74.
54. DIAMOND fact sheet. Minneapolis, MN: Institute for Clinical Systems Improvement; 2009. Available at: [http://www.icsi.org/health\\_care\\_redesign\\_/diamond\\_35953/diamond\\_fact\\_sheet/](http://www.icsi.org/health_care_redesign_/diamond_35953/diamond_fact_sheet/). Accessed October 26, 2010.
55. Moscicki E. Epidemiology of completed and attempted suicide: toward a framework for prevention. *Clin Neurosci Res* 2001;1:310-23.
56. Tarrrier N, Taylor K, Gooding P. Cognitive-behavioral interventions to reduce suicide behavior: a systematic review and meta-analysis. *Behav Modif* 2008 Jan;32(1):77-108.
57. Brown GK, Ten Have T, Henriques GR, et al. Cognitive therapy for the prevention of suicide attempts: a randomized controlled trial. *Jama* 2005 Aug 3;294(5):563-70.
58. Alcohol and Public Health: Frequently asked questions. Atlanta, GA: Centers for Disease Control and Prevention; 2009. Available at: <http://www.cdc.gov/alcohol/faqs.htm#16>. Accessed December 22, 2009.

# Effectiveness of Care

59. Stratton KR, Howe CJ, Battaglia FC. Fetal alcohol syndrome: diagnosis, epidemiology, prevention, and treatment. Washington, DC: Institute of Medicine; 1996.
60. Ulleland CN. The offspring of alcoholic mothers. *Ann N Y Acad Sci* 1972 May 25;197:167-9.
61. Ringold S, Lynn C, Glass RM. Jama patient page. Alcohol abuse and alcoholism. *Jama* 2006 May 3;295(17):2100.
62. Pleis JR, Lucas JW, Ward BW. Summary health statistics for U.S. adults: National Health Interview Survey, 2008. *Vital Health Stat* 10 2009 Dec(242):1-157.
63. Bloom B, Cohen RA, Freeman G. Summary health statistics for U.S. children: National Health Interview Survey, 2008. *Vital Health Stat* 10 2009;10(244): Publication No. (PHS) 2009-1567.
64. Akinbami LJ, Moorman JE, Garbe PL, et al. Status of childhood asthma in the United States, 1980-2007. *Pediatrics* 2009 Mar;123 Suppl 3:S131-45.
65. Medline Plus. Common cold: overview. Bethesda, MD: National Institutes of Health. Available at: [www.nih.gov/medlineplus/commoncold.htm](http://www.nih.gov/medlineplus/commoncold.htm). Accessed March 14, 2011.
66. HCUPnet. Rockville, MD: Agency for Healthcare Research and Quality; 2009. Available at: <http://hcupnet.ahrq.gov/HCUPnet.jsp>. Accessed July 22, 2009.
67. National Institute of Allergy and Infectious Diseases, Office of Communications and Public Liaison. Pneumococcal pneumonia: cause. Bethesda, MD: National Institutes of Health; 2004. Available at: <http://www3.niaid.nih.gov/topics/pneumonia/Cause.htm>. Accessed November 14, 2008.
68. Trends in tuberculosis incidence—United States, 2008. *MMWR* 2009;58(10):249-53.
69. National Heart, Lung, and Blood Institute. Fact book fiscal year 2008. Bethesda, MD: National Institutes of Health; 2008. Available at: <http://www.nhlbi.nih.gov/about/factbook-08/FactBookFinal.pdf>. Accessed August 17, 2009.
70. 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.
71. National Heart, Lung, and Blood Institute. 2007 chart book on cardiovascular, lung, and blood diseases. Bethesda, MD: National Institutes of Health; 2007. Available at: <http://www.nhlbi.nih.gov/resources/docs/07a-ctbk.pdf>. Accessed June 18, 2008.
72. Davis MM. Race-based immunization recommendations and the potential to reduce health disparities. *Jama* 2004 May 12;291(18):2253-5.
73. Flannery B, Schrag S, Bennett NM, et al. Active Bacterial Core Surveillance/Emerging Infections Program Network. Impact of childhood vaccination on racial disparities in invasive *Streptococcus pneumoniae* infections. *Jama* 2004 May 12;291(18):2197-203.
74. Kozak L, DeFrances C, Hall M. National Hospital Discharge Survey: 2004 annual summary with detailed diagnosis and procedure data, Table 12: rate of discharges from short-stay hospitals by age and first-listed diagnosis. *Vital Health Stat* 2006 October;13(162).
75. National Institute of Allergy and Infectious Diseases. Tuberculosis. Bethesda, MD: National Institutes of Health; 2006. Available at: <http://www3.niaid.nih.gov/topics/tuberculosis>. Accessed April 24, 2009.
76. National Heart, Lung, and Blood Institute, National Asthma Education and Prevention Program. Expert panel report 3: guidelines for the diagnosis and management of asthma. Full report 2007. Bethesda, MD: National Institutes of Health; 2007. Publication No. NIH 07-4051. Available at: <http://www.nhlbi.nih.gov/guidelines/asthma/asthgdln.pdf>. Accessed November 4, 2008.
77. National Heart, Lung, and Blood Institute, National Asthma Education and Prevention Program. Key clinical activities for quality asthma care: recommendations of the National Asthma Education and Prevention Program. Bethesda, MD: National Institutes of Health; 2003. Available at: <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5206a1.htm>.
78. National Heart, Lung, and Blood Institute. Quick reference for the NAEPP expert panel report: guidelines for the diagnosis and management of asthma—update on selected topics 2002. Bethesda, MD: National Institutes of Health; 2002. Publication No. NIH 02-5075. Available at: <http://www.nhlbi.nih.gov/guidelines/asthma/asthsumm.htm>. Accessed November 7, 2008.
79. Szeffler SJ. Leukotriene modifiers: what is their position in asthma therapy? *J Allergy Clin Immunol* 1998 Aug;102(2):170-72.
80. Centers for Disease Control and Prevention. Smoking-attributable mortality, years of potential life lost, and productivity losses—United States, 2000-2004. *MMWR* 2008 57(45):1226-8.

# Effectiveness of Care

81. Pleis J, Ward B, Lucas J. Summary health statistics for U.S. adults: National Health Interview Survey, 2009 (provisional report). Atlanta, GA: Centers for Disease Control and Prevention, National Center for Health Statistics; 2010. Available at: [www.cdc.gov/nchs/data/series/sr\\_10/sr10\\_249.pdf](http://www.cdc.gov/nchs/data/series/sr_10/sr10_249.pdf).
82. Ogden C, Carroll M, McDowell M, et al. Obesity among adults in the United States— no statistically significant change since 2003-2004. NCHS data brief No.1. Hyattsville, MD: National Center for Health Statistics; 2007. Available at: <http://www.cdc.gov/nchs/data/databriefs/db01.pdf>. Accessed June 10, 2008.
83. Finkelstein EA, Trogon JG, Cohen JW, et al. Annual medical spending attributable to obesity: payer- and service-specific estimates. *Health Aff (Project Hope)* 2009 Jul 29(5):w822-31. Epub 2009 Jul 27.
84. Satcher D, Higginbotham EJ. The public health approach to eliminating disparities in health. *Am J Public Health* 2008 Sep;98(9 Suppl):S8-11.
85. Ford ES, Bergmann MM, Kroger J, et al. Healthy living is the best revenge: findings from the European Prospective Investigation Into Cancer and Nutrition—Potsdam study. *Arch Intern Med* 2009 Aug 10;169(15):1355-62.
86. Centers for Disease Control and Prevention. The health consequences of smoking: a report of the Surgeon General. Washington, DC: Government Printing Office; 2004. Available at: [http://www.cdc.gov/tobacco/data\\_statistics/sgr/2004/index.htm](http://www.cdc.gov/tobacco/data_statistics/sgr/2004/index.htm).
87. Hoyert D, Kung H, Smith B. Deaths: preliminary data for 2003. Hyattsville, MD: Centers for Disease Control and Prevention, National Center for Health Statistics; 2005. Available at: <http://www.cdc.gov/nchs/pressroom/05facts/lifeexpectancy.htm>. Accessed November 13, 2008.
88. Cigarette smoking and cardiovascular diseases. Dallas, TX: American Heart Association; 2008. Available at: <http://www.americanheart.org/presenter.jhtml?identifier=4545>. Accessed March 12, 2010.
89. The health benefits of smoking cessation: a report of the Surgeon General. Rockville, MD: U.S. Department of Health and Human Services; 1990. Publication No. CDC 90-8416. Available at: [http://profiles.nlm.nih.gov/NN/B/B/C/T/\\_/nmbbct.pdf](http://profiles.nlm.nih.gov/NN/B/B/C/T/_/nmbbct.pdf). Accessed November 14, 2008.
90. National Center for Chronic Disease Prevention and Health Promotion, Division of Nutrition and Physician Activity. Overweight and obesity. Atlanta, GA: Centers for Disease Control and Prevention; 2008. Available at: <http://www.cdc.gov/nccdphp/dnpa/obesity/>. Accessed May 8, 2008.
91. U.S. Preventive Services Task Force. Screening for obesity in adults: recommendations and rationale. Rockville, MD: Agency for Healthcare Research and Quality; 2003. Available at: <http://www.ahrq.gov/clinic/3rduspstf/obesity/obesrr.htm>. Accessed May 8, 2008.
92. Diaz VA, Mainous AG 3rd, Koopman RJ, et al. Undiagnosed obesity: implications for undiagnosed hypertension, diabetes, and hypercholesterolemia. *Fam Med* 2004 Oct;36(9):639-44.
93. Calfas KJ, Long BJ, Sallis JF, et al. A controlled trial of physician counseling to promote the adoption of physical activity. *Prev Med* 1996 May-Jun;25(3):225-33.
94. Adams P, Martinez M, Vickerie J. Summary health statistics for the U.S. population: National Health Interview Survey, 2009. Hyattsville, MD: National Center for Health Statistics; 2009. Available at: [http://www.cdc.gov/nchs/data/series/sr\\_10/sr10\\_248.pdf](http://www.cdc.gov/nchs/data/series/sr_10/sr10_248.pdf). Accessed January 6, 2011.
95. National Center for Health Statistics, Division of Health Care Statistics. National Nursing Home Survey: 2004 overview. *Vital Health Stat* 2009 June;(13)167.
96. Ciolek D, Hwang W. CY 2006 outpatient therapy services utilization report (Prepared by Computer Sciences Corporation ). Baltimore, MD: Centers for Medicare & Medicaid Services; 2008. Available at: [www.cms.hhs.gov/TherapyServices/downloads/2\\_CY2006OutpatientTherapyUtilizationReport\\_PDF\\_Final.pdf](http://www.cms.hhs.gov/TherapyServices/downloads/2_CY2006OutpatientTherapyUtilizationReport_PDF_Final.pdf). Accessed August 12, 2009.
97. Lane NE. Epidemiology, etiology, and diagnosis of osteoporosis. *Am J Obstet Gynecol* 2006 Feb;194(2 Suppl):S3-11.
98. U.S. Preventive Services Task Force. Screening for osteoporosis in postmenopausal women: recommendations and rationale. In: *Guide to clinical preventive services*. 3rd ed: Recommendations and systematic evidence reviews, guide to community preventive services. Rockville, MD: Agency for Healthcare Research and Quality; 2002. Available at: [www.ncbi.nlm.nih.gov/books/NBK15363/](http://www.ncbi.nlm.nih.gov/books/NBK15363/). Accessed August 12, 2009.



# Effectiveness of Care

99. Nursing home data compendium 2008 edition. Table 2.1, Characteristics of nursing home residents in the United States, 2007. Baltimore, MD: Centers for Medicare & Medicaid Services; 2008. Available at: [http://www.cms.hhs.gov/CertificationandCompliance/Downloads/2008NursingHomeDataCompendium\\_508.pdf](http://www.cms.hhs.gov/CertificationandCompliance/Downloads/2008NursingHomeDataCompendium_508.pdf). Accessed February 25, 2009.
100. Medicare home health agency utilization by State, calendar year 2006. Baltimore, MD: Centers for Medicare & Medicaid Services; 2006. Available at: [www.cms.hhs.gov/MedicareFeeForSvcPartsAB/Downloads/HHAst06.pdf](http://www.cms.hhs.gov/MedicareFeeForSvcPartsAB/Downloads/HHAst06.pdf). Accessed July 2009.
101. Centers for Medicare & Medicaid Services. Table 8.1 Number of hospices, number of persons, covered days of care, total charges, and program payments for hospice services used by Medicare beneficiaries: calendar years 1993-2006: Health Care Finance Rev Stat Supp 2007. Available at: <http://www.cms.hhs.gov/Medicaremedicaidstatsupp/Downloads/2007table8.1b.pdf>. Accessed March 12, 2010.
102. National health expenditures aggregate amounts and average percent change, by type of expenditure: selected calendar years 1960-2008: Baltimore, MD: Centers for Medicare & Medicaid Services, Office of the Actuary, National Health Statistics Group; 2008. Available at: <http://www.cms.hhs.gov/NationalHealthExpendData/downloads/tables.pdf>. Accessed February 25, 2009.
103. Medicare hospice data trends: 1998-2008. Baltimore, MD: Centers for Medicare & Medicaid Services; 2009. Available at: [www.cms.hhs.gov/Hospice/downloads/Hospice\\_Data\\_1998-2008.zip](http://www.cms.hhs.gov/Hospice/downloads/Hospice_Data_1998-2008.zip). Accessed December 22, 2009.
104. Wenger NS, Shugarman LR, Wilkinson A, et al. Advance directives and advance care planning: report to Congress (Prepared through contract between RAND Health and U.S. Department of Health and Human Services, Office of the Assistant Secretary for Planning and Evaluation under Contract No. HHS-100-03-0023). Washington, DC: U.S. Department of Health and Human Services; 2008. Available at: <http://aspe.hhs.gov/daltcp/reports/2008/adcongrpt.htm>. Accessed December 9, 2009.
105. National Priorities Partnership. National priorities and goals: aligning our efforts to transform America's healthcare. Washington, DC: National Quality Forum; 2008.
106. Field M, Cassell C, eds. Approaching death: improving care at the end of life. Washington, DC: National Academy Press; 1997.
107. Connor SR, Teno J, Spence C, et al. Family Evaluation of Hospice Care: results from voluntary submission of data via website. *J Pain Symptom Manage* 2005 Jul;30(1):9-17.
108. Connor SR, Elwert F, Spence C, et al. Geographic variation in hospice use in the United States in 2002. *J Pain Symptom Manage* 2007 Sep;34(3):277-85.
109. Carlson MD, Herrin J, Du Q, et al. Hospice characteristics and the disenrollment of patients with cancer. *Health Serv Res* 2009 Dec;44(6):2004-21.
110. Carlson MD, Herrin J, Du Q, et al. Impact of hospice disenrollment on health care use and Medicare expenditures for patients with cancer. *J Clin Oncol* Oct 1;28(28):4371-5.
111. Morrison R, Dietrich J, Meier D. America's care of serious illness: a State-by-State report card on access to palliative care in our Nation's hospitals: National Palliative Care Research Center; 2008. Available at: <http://www.capc.org/reportcard/>. Accessed October 28, 2010.



# Chapter 3. Patient Safety

## Importance

### Mortality

Number of Americans who die each year from medical errors (1999 est.).....44,000-98,000<sup>1</sup>

### Prevalence

Rate of adverse events for hospitalized patients (annual estimates).....2.9%-3.7%<sup>1</sup>

Rate of adverse drug reactions during hospital admissions (annual estimates) .....2.0%-6.7%<sup>2-4</sup>

Rate of adverse drug events among Medicare beneficiaries in ambulatory settings .....50 per 1,000 person-years<sup>5</sup>

### Cost

Cost attributable to medical errors (2008 est.) .....\$19.5 billion<sup>6</sup>

Total cost per error (2008 est.).....\$13,000<sup>6</sup>

Annual cost attributable to surgical errors (2008 est.) .....\$1.5 billion<sup>7</sup>

## Measures

The Institute of Medicine (IOM) defines patient safety as “freedom from accidental injury due to medical care or medical errors.”<sup>1</sup> In 1999, the IOM published *To Err Is Human: Building a Safer Health System*, which called for a national effort to reduce medical errors and improve patient safety.<sup>1</sup> In response to the IOM’s report, President George W. Bush signed the Patient Safety and Quality Improvement Act of 2005 (Patient Safety Act).<sup>1</sup> The act was designed to spur the development of voluntary, provider-driven initiatives to improve the quality, safety, and outcomes of patient care. The Patient Safety Act addresses many of the current barriers to improving patient care.

Central to this effort is the ability to measure and track adverse events. Measuring patient safety is complicated by difficulties in assessing and ensuring the systematic reporting of medical errors and adverse events. All too often, adverse event reporting systems are laborious and cumbersome. Health care providers may also fear that if they participate in the analysis of medical errors or patient care processes, the findings may be used against them in court or harm their professional reputations. Many factors limit the ability to aggregate data in sufficient numbers to rapidly identify prevalent risks and hazards in the delivery of patient care, their underlying causes, and practices that are most effective in mitigating them. These include difficulties aggregating and sharing data confidentially across facilities or State lines.

<sup>1</sup> Patient Safety and Quality Improvement Act of 2005, 42 U.S.C. 299b-21 to 299b-26.



# Patient Safety

In addition, although *To Err Is Human* does not mention race or ethnicity when discussing the problem of patient safety, such data are limited. Any differences that suggest patient race and/or ethnicity might influence the risk of experiencing a patient safety event must be investigated to better understand the underlying reasons for any differences before the differences can be eliminated.

Despite these limitations, a better picture of patient safety is emerging. Progress has been made in recent years in raising awareness, developing reporting systems, and establishing national data collection standards. Examining patient safety using a combination of administrative data, medical record abstraction, spontaneous adverse event reports, and patient surveys allows a more robust understanding of what is improving and what is not. Still, data remain incomplete for a comprehensive national assessment of patient safety.<sup>8</sup>

The National Priorities Partnership (NPP) identified safety in health care as one of six national priorities. The goal is a health care system that is:

...relentless in continually reducing the risks of injury from care, aiming for “zero” harm wherever and whenever possible—a system that can promise absolutely reliable care, guaranteeing that every patient, every time, receives the benefits of care based solidly on science.<sup>9</sup>

The key goals include: (1) health care organizations and staff ensuring a culture of safety in order to reduce healthcare-associated infections (HAIs) and serious adverse events (SAEs), (2) hospitals reducing preventable and premature hospital-level mortality rates, and (3) hospitals improving their 30-day mortality rates for selected conditions (e.g., acute myocardial infarction, pneumonia).

The National Healthcare Quality Report (NHQR) has tracked a growing number of patient safety measures. Organized around the NPP priority of Safety, the 2010 NHQR presents the following measures:

- Reduction of HAIs:
  - Appropriate timing of antibiotics (core measure).
  - Postoperative sepsis.
- Reduction of SAEs:
  - Ambulatory care visits due to adverse effects of medical care.
  - Mechanical adverse events.
  - Postoperative respiratory failure.
- Preventable and premature mortality rates:
  - Failure to rescue (core measure).
- 30-day mortality rates:
  - Pneumonia mortality rates.

## Findings

### Healthcare-Associated Infections

Infections acquired during hospital care (nosocomial infections) are one of the most serious patient safety concerns. They are the most common complication of hospital care.<sup>10</sup> An estimated 1.7 million HAIs occur

# Patient Safety

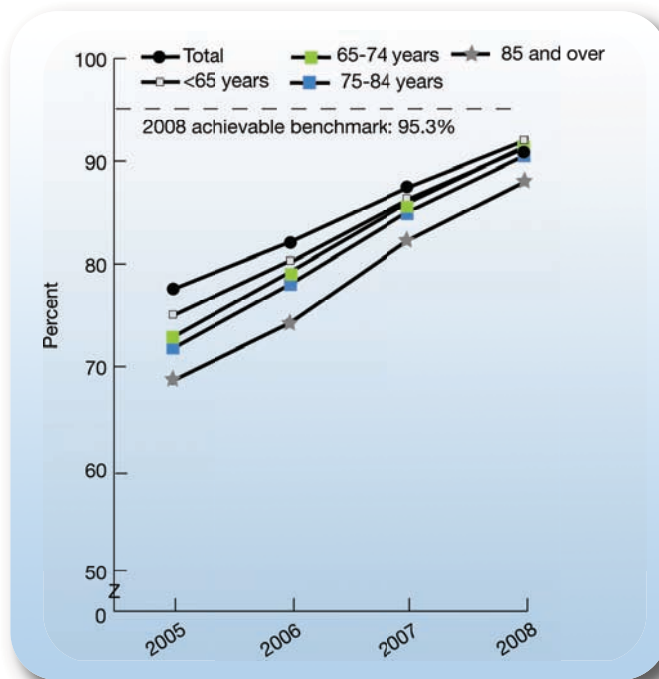
each year in hospitals, leading to about 100,000 deaths. The most common infections are urinary tract, surgical site, and bloodstream infections.<sup>11</sup>

A specific medical error cannot be identified in most cases of HAIs. However, better application of evidence-based preventive measures can reduce HAI rates within an institution. For example, one such measure includes the administration of prophylactic antibiotics at the right time prior to surgery.

## Prevention: Appropriate Timing of Antibiotics Among Surgical Patients

Wound infection following surgery is a common HAI. Hospitals can reduce the risk of surgical site infection by making sure patients get the right antibiotics at the right time on the day of their surgery. Surgery patients who get antibiotics within the hour before their operation are less likely to get wound infections than those who do not. Getting an antibiotic earlier or after surgery begins is not as effective. However, taking these antibiotics for more than 24 hours after routine surgery is usually not necessary and can increase the risk of side effects, such as antibiotic resistance and serious types of diarrhea. Among adult Medicare patients having surgery, the NHQR tracks receipt of antibiotics within 1 hour prior to surgical incision, discontinuation of antibiotics within 24 hours after end of surgery, and a composite of these two measures.

**Figure 3.1. Adult surgery patients who received appropriate timing of antibiotics: Overall composite, by age, 2005-2008**



**Source:** Centers for Medicare & Medicaid Services, Medicare Quality Improvement Organization Program, 2005-2008.

**Denominator:** Hospitalized patients having surgery.

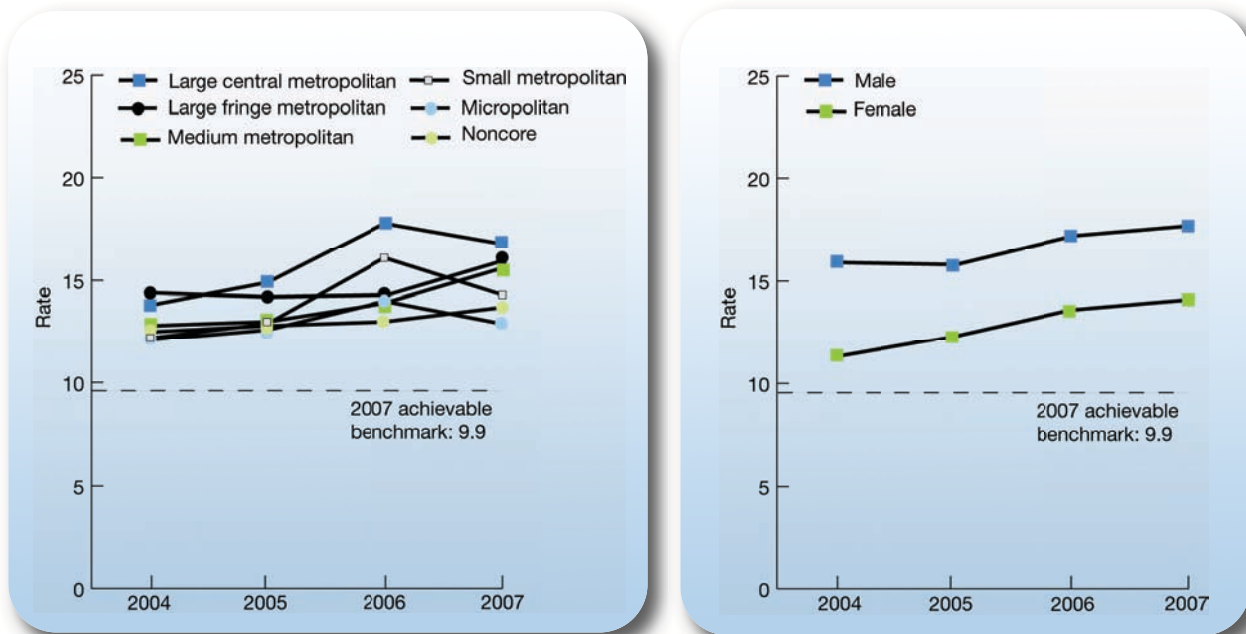
# Patient Safety

- The percentage of adult surgery patients who received appropriate timing of antibiotics improved from 2005 to 2008 (74.9% to 91.4%; Figure 3.1). Improvement was also seen among all age groups during this period.
- In 2008, patients age 85 and over were less likely than patients under age 65 to receive appropriate timing of antibiotics.
- The 2008 top 5 State achievable benchmark was 95.3%.<sup>ii</sup> At the current 7% annual rate of increase, this benchmark could be attained overall in about 1 year. All age groups could attain the benchmark in less than 1 year, except for those age 85 and over, who should achieve the benchmark in a little over 1 year.

## Outcome: Postoperative Sepsis

Sepsis, a severe bloodstream infection, can occur after surgery. In a recent study, postoperative sepsis occurred in 4.5% of emergency surgery patients and 2.0% of elective surgery patients.<sup>12</sup> Regarding racial disparities, a recent study revealed that higher rates of infection as well as higher risk for acute organ dysfunction both contribute to higher rates of sepsis among Blacks compared with Whites (refer to NHDR).<sup>13</sup> Rates can be reduced by giving patients appropriate prophylactic antibiotics 1 hour prior to surgical incision.

**Figure 3.2. Postoperative sepsis per 1,000 elective-surgery discharges with an operating room procedure, by geographic location and gender, 2004-2007**



**Source:** Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, and AHRQ Quality Indicators, version 3.1.

**Denominator:** All elective hospital surgical discharges, age 18 and over, with length of stay of 4 or more days, excluding patients admitted for infection, patients with cancer or immunocompromised states, patients with obstetric conditions, and admissions specifically for sepsis.

**Note:** Rates are adjusted by age, gender, age-gender interactions, comorbidities, and diagnosis-related group (DRG) clusters. When reporting is by gender, the adjustment is by age, comorbidities, and DRG clusters.

<sup>ii</sup> The top 5 States that contributed to the achievable benchmark are Hawaii, Maine, New Hampshire, South Dakota, and Vermont.

# Patient Safety

- From 2004 to 2007, the overall rate of postoperative sepsis increased from 13.2 per 1,000 discharges to 15.8 (data not shown). During the same period, a significant increase was also seen among all geographic and gender groups (Figure 3.2).
- In 2007, residents of small metropolitan, micropolitan, and noncore<sup>iii</sup> areas had a significantly lower rate of postoperative sepsis than those in large fringe metropolitan areas (14.3, 12.9, and 13.7 per 1,000 hospital discharges compared with 16.0).
- In 2007, females had a significantly lower rate of postoperative sepsis than males (14.1 per 1,000 hospital discharges compared with 17.7).
- The 2007 top 4 State achievable benchmark was 9.9 per 1,000 hospital discharges.<sup>iv</sup> The overall rate of postoperative sepsis, as well as the rates among all geographic and gender groups, was increasing (moving away from the benchmark).

## Adverse Events

Adverse effects of medical care can arise from medical and surgical procedures, as well as from adverse drug reactions. Although patient safety initiatives are predominantly focused on inpatient hospital events, adverse effects of medical care are much more commonly treated at visits to outpatient settings, with more than 12 million such visits occurring annually. Providers treating adverse events in outpatient settings may include office-based physicians, hospital outpatient departments, and hospital emergency departments. Events treated in ambulatory settings may be less severe than those occurring in inpatient settings.

Some adverse events, such as known side effects of appropriately prescribed medications may be unavoidable, while others may be considered medical errors. Although the following measure does not distinguish between the two types of events, it provides an overall sense of the burden these events place on the population.



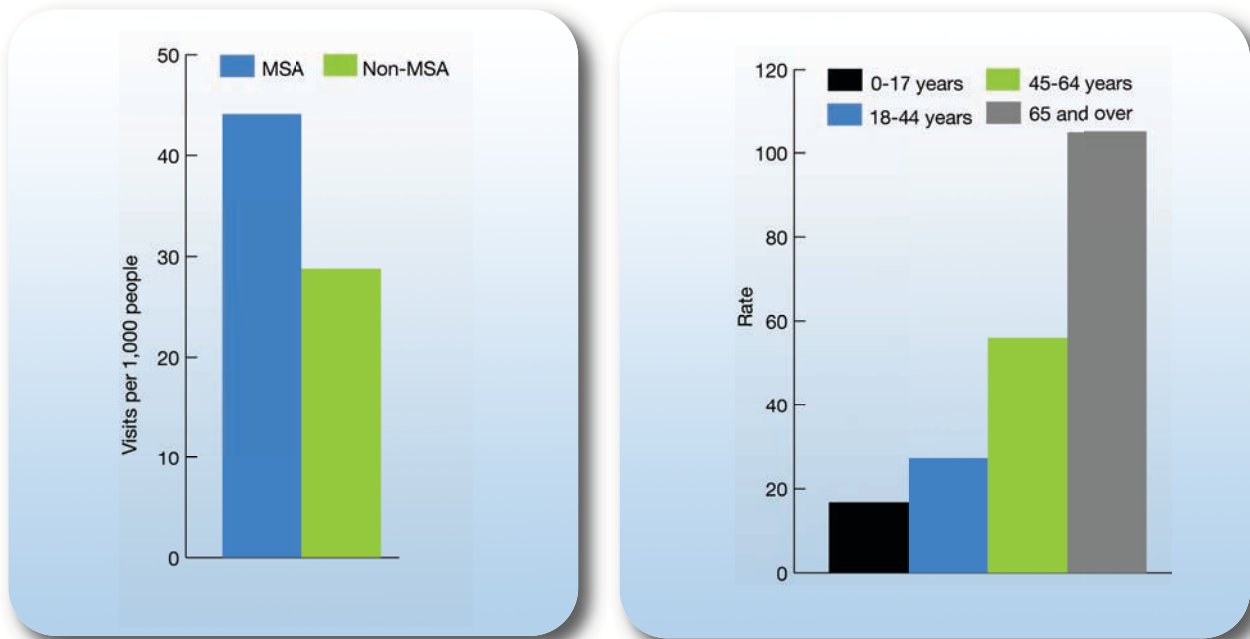
<sup>iii</sup> Noncore areas are outside of metropolitan or micropolitan statistical areas. Micropolitan and noncore areas are typically regarded as “rural.”

<sup>iv</sup> The top 4 States that contributed to the achievable benchmark are Arkansas, Massachusetts, Nebraska, and Rhode Island.

# Patient Safety

## Outcome: Ambulatory Care Visits Due to Adverse Effects of Medical Care

**Figure 3.3. Ambulatory medical care visits due to adverse effects of medical care per 1,000 people, by geographic area and age, 2007-2008**



**Key:** MSA = metropolitan statistical area.

**Source:** Centers for Disease Control and Prevention, National Center for Health Statistics, National Ambulatory Medical Care Survey and National Hospital Ambulatory Medical Care Survey, 2007-2008.

**Denominator:** U.S. Census Bureau estimated civilian noninstitutionalized population on July 1, 2007, and July 1, 2008.

**Note:** Ambulatory care includes visits to office-based physicians, hospital outpatient departments, and hospital emergency departments.

- In 2007-2008, the rate of ambulatory care visits due to adverse effects of medical care was higher for residents of metropolitan areas compared with residents of nonmetropolitan areas (Figure 3.3).
- In 2007-2008, the rate of ambulatory care visits due to adverse effects was also higher for all age groups compared with the group ages 0-17.

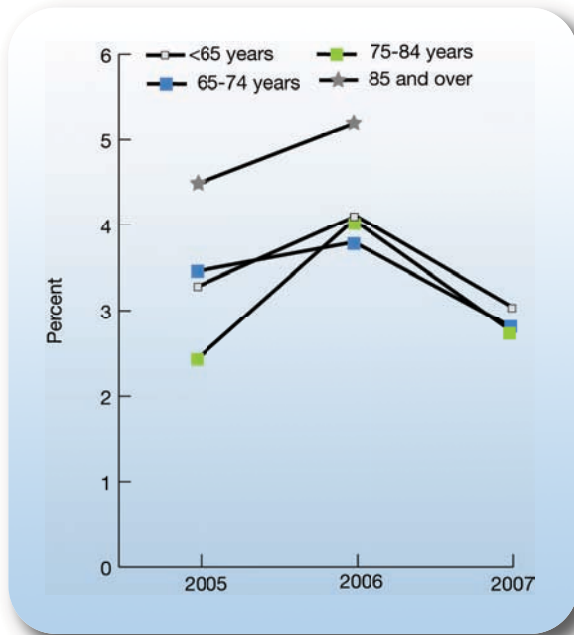
Also, in the NHDR:

- In 2007-2008, the rate of ambulatory care visits due to adverse effects was higher for females compared with males.

## Outcome: Mechanical Adverse Events

Sometimes patients need a central venous catheter inserted into a major vein in the neck, chest, or groin to administer medication or fluids, obtain blood for tests, or take cardiovascular measurements. Patients who require a central venous catheter tend to be severely ill. The placement and use of these catheters can result in mechanical adverse events, including bleeding; hematoma; perforation; pneumothorax; air embolism; and misplacement, occlusion, shearing, or knotting of the catheter.

**Figure 3.4. Composite: Mechanical adverse events associated with central venous catheter placement, by age, 2005-2007**



**Source:** Centers for Medicare & Medicaid Services, Medicare Patient Safety Monitoring System (MPSMS), 2005-2007.

**Denominator:** Adult hospitalized Medicare fee-for-service discharges from the MPSMS sample with central venous catheter placement.

**Note:** Data for age 85+ in 2007 did not meet criteria for statistical reliability, quality, or confidentiality. Mechanical adverse events include allergic reaction to the catheter, tamponade, perforation, pneumothorax, hematoma, shearing off of the catheter, air embolism, misplaced catheter, thrombosis or embolism, knotting of the pulmonary artery catheter, and certain other events.

- From 2005 to 2007, there was no statistically significant change overall, or for any age group, in medical adverse events associated with central venous catheter placement (Figure 3.4).

## Preventable and Premature Mortality Rates

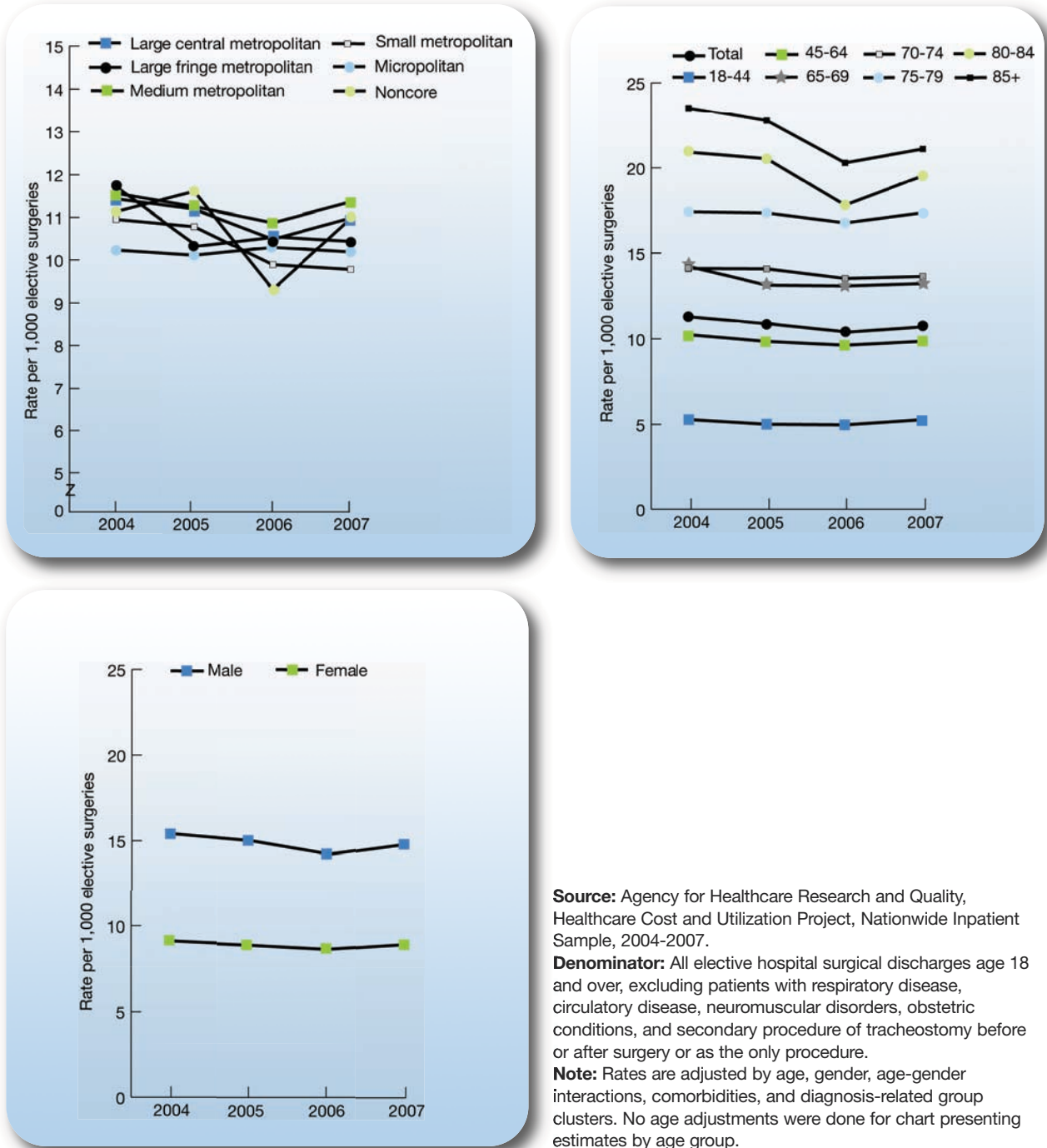
### Outcome: Postoperative Respiratory Failure

Respiratory failure is not uncommon after surgery and may necessitate reintubation or prolonged mechanical ventilation. Causes include oversedation, exacerbation of underlying cardiovascular or respiratory conditions, and ventilator-associated pneumonia. Although some cases of respiratory failure cannot be prevented, closer attention to risk factors can reduce rates.



# Patient Safety

**Figure 3.5. Postoperative respiratory failure per 1,000 elective surgery discharges after an operating room procedure, by geographic location, age, and gender, 2004-2007**



- In 2007, there were no statistically significant differences in the rate of postoperative respiratory failure among patients living in different geographic areas (Figure 3.5).

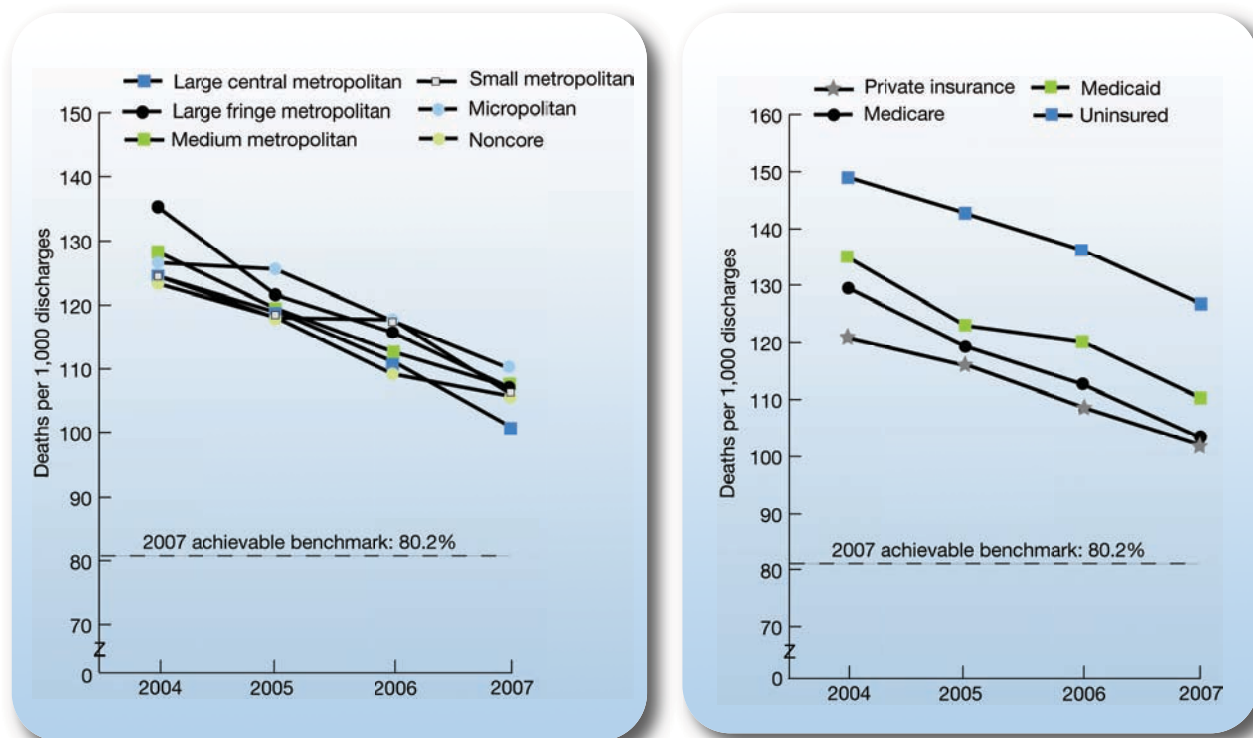
# Patient Safety

- Females had a lower rate of postoperative respiratory failure than males (9.0% compared with 14.8%).
- The rate of postoperative respiratory failure for all other older age groups was higher than for those ages 65-74. Also, compared with those ages 18-44, the rate of postoperative respiratory failure was higher for all other age groups.

## Outcome: Deaths Following Complications of Care

Many complications that arise during hospital stays cannot be prevented. However, rapid identification and aggressive treatment of complications may prevent these complications from leading to death. The indicator “deaths following complications of care,” also called “failure to rescue,” tracks deaths among patients whose hospitalizations are complicated by pneumonia, thromboembolic events, sepsis, acute renal failure, gastrointestinal bleeding or acute ulcer, shock, or cardiac arrest.<sup>14</sup>

**Figure 3.6. Deaths per 1,000 discharges with complications potentially resulting from care during hospitalization (failure to rescue), ages 18-74, by geographic location and insurance status, 2004-2007**



**Source:** Agency for Healthcare Research and Quality, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2004-2007.

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

**Note:** Rates are adjusted by age, gender, comorbidities, and diagnosis-related group clusters.

- From 2004 to 2007, the rate of deaths following complications of care declined from 128.9 to 105.7 per 1,000 admissions of adults ages 18-74 (data not shown). A significant decrease was also seen among all geographic, gender (data not shown), and insurance groups during the same period.

# Patient Safety

- In 2007, females had a significantly lower rate of deaths following complications than males (99.8 per 1,000 discharges compared with 112.1; data not shown).
- In 2007, for those who were uninsured, the rate of deaths following complications of care was higher than for those with private insurance (126.8 per 1,000 admissions compared with 101.8; Figure 3.6).

Also, in the NHDR:

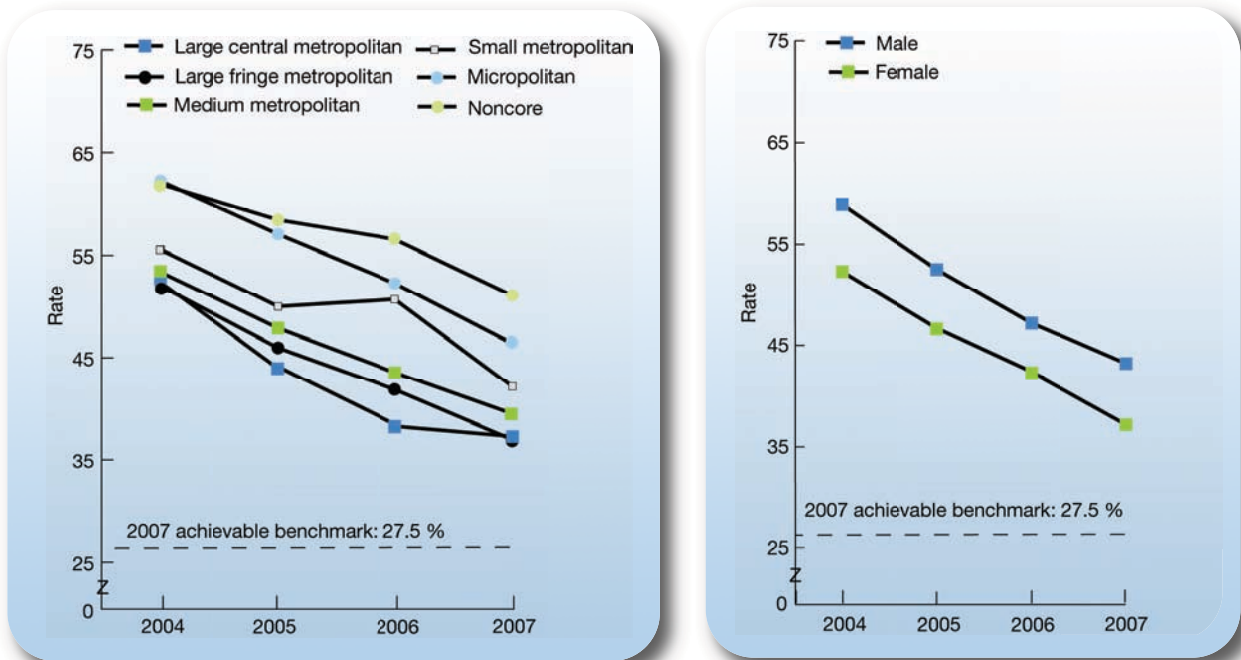
- Asians have a significantly higher rate of deaths following complications than Whites (130.2 per 1,000 discharges compared with 111.3).

## 30-Day Mortality Rates

One of the goals for measurement specified by the NPP under the Safety priority is to reduce 30-day hospital mortality rates for conditions such as pneumonia. While national 30-day mortality rates due to pneumonia are not currently available for reporting, the in-hospital mortality rates per 1,000 hospital admissions with pneumonia are reported here. About two-thirds of patients who die within 30 days of hospital admission die inside the hospital, and the correlation between inpatient and 30-day mortality is high.<sup>15</sup>

### Outcome: Inpatient Pneumonia Deaths

**Figure 3.7. Deaths per 1,000 hospital admissions with pneumonia as principal diagnosis, age 18 and over, United States, by geographic location and gender, 2004-2007**



**Source:** Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, and AHRQ Quality Indicators, version 3.1.

**Denominator:** All discharges age 18 and over with principal diagnosis code of pneumonia, excluding patients transferred to another short-term hospital and obstetric and neonatal admissions.

**Note:** Rates are adjusted by age, gender, age-gender interactions, and all patient refined-diagnosis related group (APR-DRG) risk of mortality score. When reporting is by gender, the adjustment is by age and APR-DRG risk of mortality score.

# Patient Safety

- From 2004 to 2007, the inpatient pneumonia mortality rate decreased overall from 55.2 per 1,000 admissions to 40.8. During the same period, a significant decrease was also seen among all geographic areas and among males and females (Figure 3.7).
- In 2007, small metropolitan, micropolitan, and noncore areas had significantly worse inpatient pneumonia mortality rates than large fringe metropolitan areas.
- In 2007, females had a significantly better inpatient pneumonia mortality rate than males.
- The 2007 top 4 State achievable benchmark was 27.5 per 1,000 hospital admissions.<sup>v</sup> At the current annual rate of increase, this benchmark could be attained in less than 3 years.
- At the current rate of improvement, large fringe metropolitan, large central metropolitan, and medium metropolitan areas could attain the benchmark in 2 to 3 years. However, small metropolitan and micropolitan areas could not attain the benchmark for almost 4 years and noncore areas could not attain the benchmark for almost 7 years.
- Females could attain the benchmark in 2 years, while males could attain the benchmark in 3 years.



---

<sup>v</sup> The top 4 States that contributed to the achievable benchmark are Arizona, Colorado, Maryland, and Michigan.

# Patient Safety

## References

1. Kohn L, Corrigan J, Donaldson M, eds. *To err is human: building a safer health system*. Washington, DC: Institute of Medicine, Committee on Quality of Health Care in America; 2000.
2. Lazarou J, Pomeranz BH, Corey PN. Incidence of adverse drug reactions in hospitalized patients: a meta-analysis of prospective studies. *Jama* 1998 Apr 15;279(15):1200-5.
3. Lesar TS, Lomaestro BM, Pohl H. Medication-prescribing errors in a teaching hospital. A 9-year experience. *Arch Intern Med* 1997 Jul 28;157(14):1569-76.
4. Classen DC, Pestotnik SL, Evans RS, et al. Adverse drug events in hospitalized patients. Excess length of stay, extra costs, and attributable mortality. *Jama* 1997 Jan 22-29;277(4):301-6.
5. Gurwitz JH, Field TS, Harrold LR, et al. Incidence and preventability of adverse drug events among older persons in the ambulatory setting. *Jama* 2003 Mar 5;289(9):1107-16.
6. Shreve J, Van De Bos J, Gray T, et al. *The economic measurement of medical errors*. Schaumburg, IL: Society of Actuaries/Milliman; 2010.
7. Encinosa WE, Hellinger FJ. The impact of medical errors on 90-day costs and outcomes: an examination of surgical patients. *Health Serv Res* 2008 Dec;43(6):2067-85. Epub 2008 Jul 25.
8. Aspden P, Corrigan J, Wolcott J, et al. *Patient safety: achieving a new standard of care*. Washington, DC: Institute of Medicine, Committee on Data Standards for Patient Safety; 2004.
9. Board of Health Care Services. *Future directions for the National Healthcare Quality and Disparities Reports*. Washington, DC: Institute of Medicine; 2010.
10. Thomas EJ, Studdert DM, Burstin HR, et al. Incidence and types of adverse events and negligent care in Utah and Colorado. *Med Care* 2000;38:261-71.
11. Klevens RM, Edwards JR, Richards CL, et al. Estimating health care-associated infections and deaths in U.S. hospitals, 2002. *Public Hlth Rep* 2007;122:160-66.
12. Moore LJ, Moore FA, Todd SR, et al. Sepsis in general surgery: the 2005-2007 National Surgical Quality Improvement Program perspective. *Arch Surg* Jul;145(7):695-700.
13. Mayr FB, Yende S, Linde-Zwirble WT, et al. Infection rate and acute organ dysfunction risk as explanations for racial differences in severe sepsis. *Jama* Jun 23;303(24):2495-2503.
14. Agency for Healthcare Research and Quality. *Guide to Patient Safety Indicators version 3.1*. Rockville, MD; 2003. Available at: [http://www.qualityindicators.ahrq.gov/downloads/psi/word/psi\\_guide\\_v31.doc](http://www.qualityindicators.ahrq.gov/downloads/psi/word/psi_guide_v31.doc). Accessed November 17, 2009.
15. Rosenthal GE, Baker DW, Norris DG, et al. Relationships between in-hospital and 30-day standardized hospital mortality: implications for profiling hospitals. *Health Serv Res* 2000 Mar;34(7):1449-68.





## Chapter 4. Timeliness

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

### Importance

#### Morbidity and Mortality

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

#### Cost

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

### Measures

This report focuses on one core report measure related to timeliness of primary, emergency, and hospital care: getting care for illness or injury as soon as wanted. In addition, two supporting measures are presented: ED waiting times, and timeliness of cardiac reperfusion for heart attack patients.



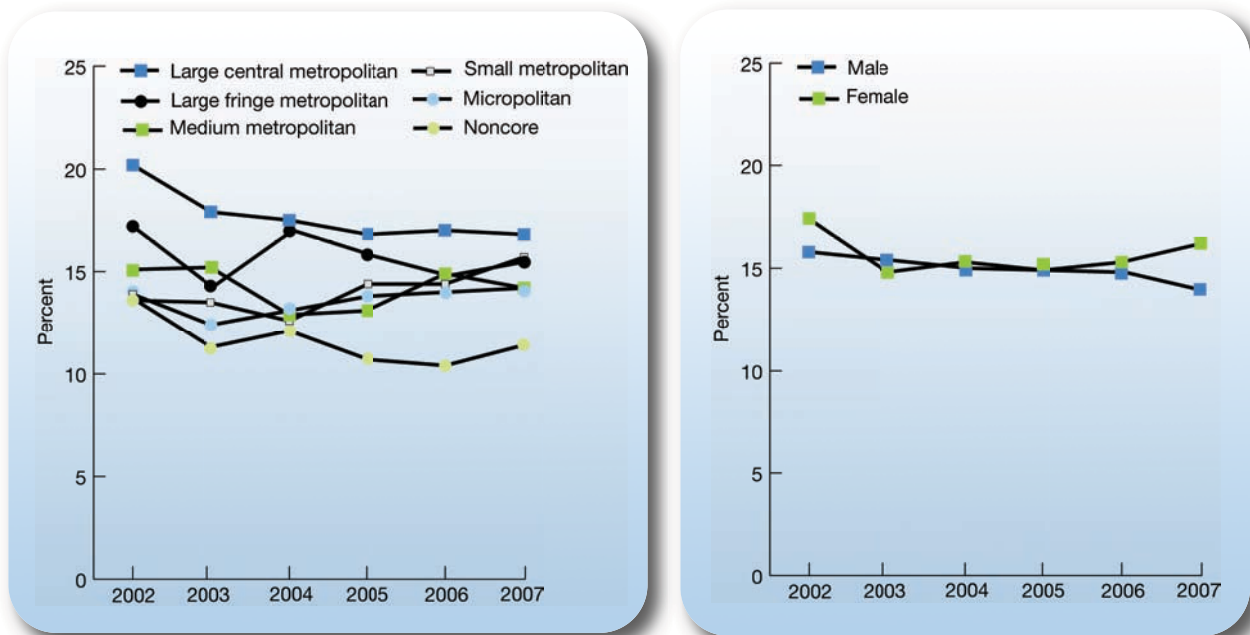
# Timeliness

## Findings

### Getting Care for Illness or Injury As Soon As Wanted

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

**Figure 4.1. Adults who needed care right away for an illness, injury, or condition in the last 12 months who sometimes or never got care as soon as wanted, by geographic location and gender, 2002-2007**



**Source:** Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2002-2007.

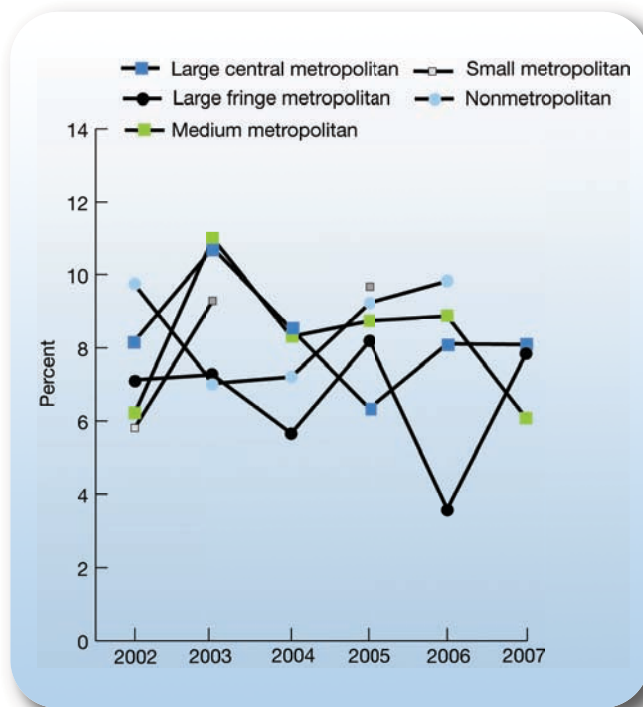
**Denominator:** Civilian noninstitutionalized population age 18 and over.

- From 2002 to 2007, the overall percentage of adults who needed care right away for an illness, injury, or condition in the last 12 months who sometimes or never got care as soon as wanted decreased (from 16.8% to 15.3%; data not shown).
- During this period, the percentage of adults in large central metropolitan areas who needed care right away for an illness, injury, or condition in the last 12 months who sometimes or never got care as soon as wanted decreased (from 20.2% to 16.8%; Figure 4.1). Also, the percentage for males during the same period decreased (from 15.8% to 13.9%).

Also, in the NHDR:

- From 2002 to 2007, the overall percentage decreased for both middle-income adults and White adults (from 16.9% to 14.8%, and from 15.8% to 14.3%, respectively).

**Figure 4.2. Children who needed care right away for an illness, injury, or condition in the last 12 months who sometimes or never got care as soon as wanted, by geographic location, 2002-2007**



**Source:** Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2002-2007.

**Denominator:** Civilian noninstitutionalized population under age 18.

**Note:** Data did not meet criteria for statistical reliability, data quality, or confidentiality for all geographic locations in all years.

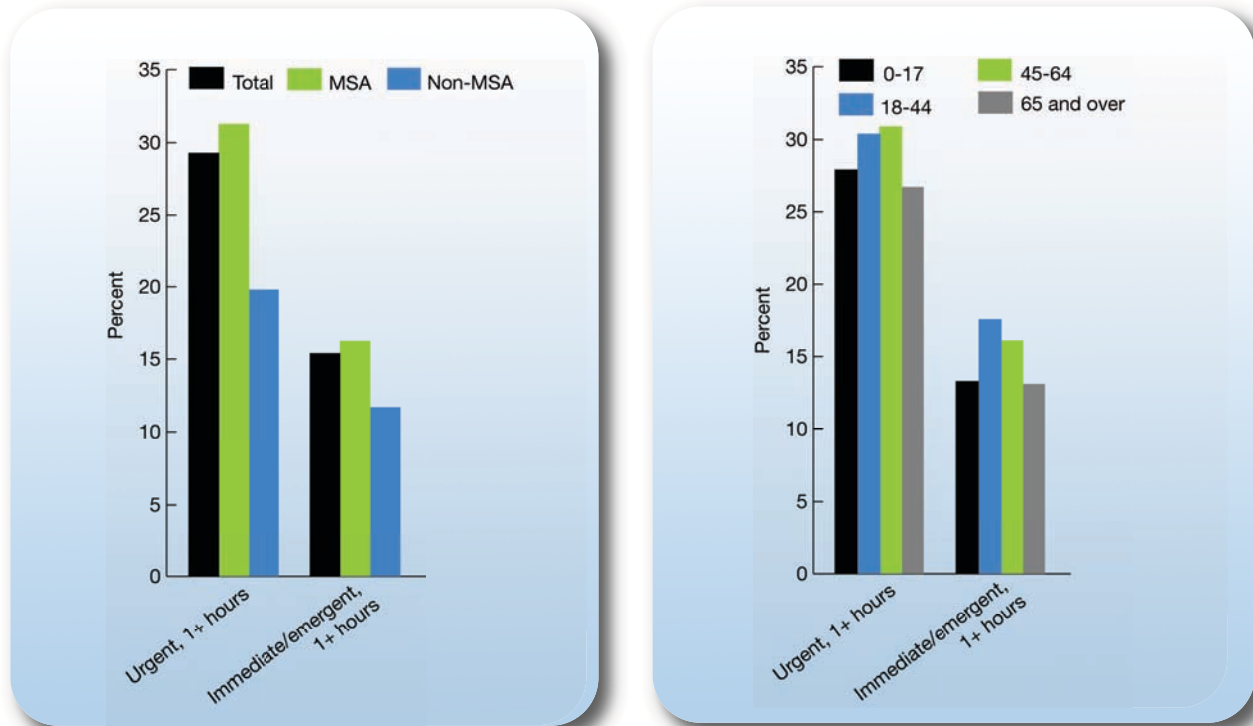
- In 2007, there were no statistically significant differences by location among children who needed care right away for an illness, injury, or condition in the last 12 months (Figure 4.2). In addition, from 2002 to 2007, none of the residential groups changed significantly.

## Emergency Department Visit Waiting Times

In 2007, an estimated 116.8 million visits were made to hospital EDs compared with 110.2 million visits in 2004.<sup>13, 14</sup> The median waiting time for patients to be seen by a physician during an ED visit in the United States was 33 minutes.<sup>13</sup> Not all patients seeking care in an ED need urgent care, and use of EDs for nonurgent care could lead to longer waiting times. The National Hospital Ambulatory Medical Care Survey defines five levels of urgency of ED visits: Immediate, requiring immediate care; Emergent, requiring care in less than 15 minutes; Urgent, requiring care within 1 hour; Semiurgent, requiring care within 2 hours; and Nonurgent, not requiring care within 2 hours.

# Timeliness

**Figure 4.3. Emergency department visits in which patient had to wait an hour or more by urgency, geographic location, and age, 2007-2008**



**Key:** MSA = metropolitan statistical area.

**Source:** Centers for Disease Control and Prevention, National Center for Health Statistics, National Hospital Ambulatory Medical Care Survey (NHAMCS), 2007-2008.

**Denominator (Immediate or Emergent):** Visits to U.S. emergency department with triage assessment of immediate or emergent, 2007-2008.

**Denominator (Urgent):** Visits to U.S. emergency department with triage assessment of urgent, 2007-2008.

- In 2007-2008, among ED visits for immediate/emergent conditions, there was no significant difference in the percentage that had to wait an hour or more between patients living in metropolitan and nonmetropolitan areas (Figure 4.3). Among visits for urgent conditions, the percentage that had to wait an hour or more was lower among nonmetropolitan patients compared with metropolitan patients (19.8% compared with 31.3%).
- Differences related to age were not significant.

Also, in the NHDR:

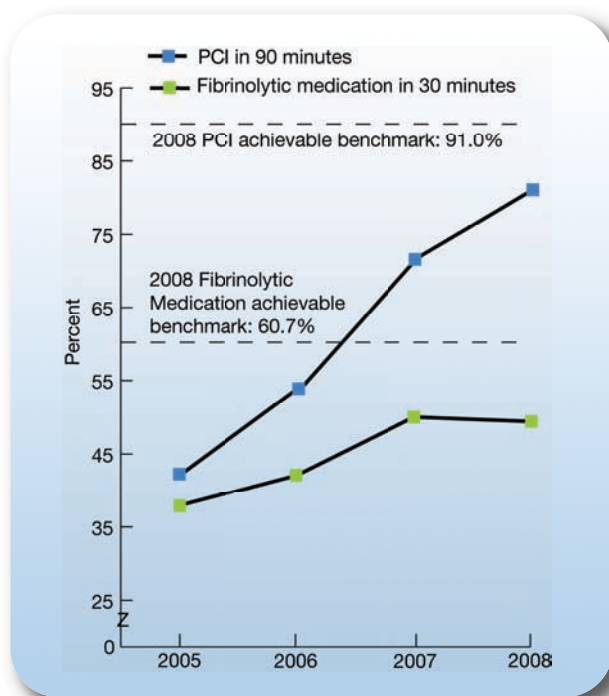
- In 2007-2008, among ED visits for immediate/emergent conditions, the percentage that had to wait an hour or more was higher among Blacks compared with Whites.
- Among visits for urgent conditions, the percentage of patients who had to wait an hour or more was higher for Blacks compared with Whites and for uninsured patients under age 65 compared with privately insured patients under age 65.

## Timeliness of Cardiac Reperfusion for Heart Attack Patients

The capacity to treat hospital patients in a timely manner is especially important for emergency situations, such as heart attacks. Some heart attacks are caused by blood clots. Early actions, such as percutaneous coronary intervention (PCI) or fibrinolytic medication, may open blockages caused by blood clots, reduce heart muscle damage, and save lives.<sup>15</sup> To be effective, these actions need to be performed quickly after the start of a heart attack. In this report, we present two measures of timeliness of cardiac reperfusion:

- PCI within 90 minutes among appropriate patients.
- Fibrinolytic medication within 30 minutes among appropriate patients.

**Figure 4.4. Hospital patients with heart attack who received percutaneous coronary intervention within 90 minutes or fibrinolytic medication within 30 minutes, 2005-2008**



**Key:** PCI = percutaneous coronary intervention.

**Source:** Centers for Medicare & Medicaid Services, Medicare Quality Improvement Organization Program, 2005-2008.

**Denominator:** Patients hospitalized with a principal diagnosis of acute myocardial infarction who were appropriate candidates for PCI or fibrinolytic medication.

- From 2005 to 2008, among heart attack patients, the percentage of patients receiving PCI within 90 minutes improved from 42.1% to 81.3% (Figure 4.4).
- During the same period, the percentage of heart attack patients receiving fibrinolytic medication within 30 minutes improved from 37.9% to 49.4%.

# Timeliness

- In 2008, the top 5 State PCI achievable benchmark was 91.0%.<sup>i</sup> At the current rate of improvement, the achievable benchmark could be attained in less than 1 year.
- In 2008, the top 5 State fibrinolytic medication achievable benchmark was 60.7%.<sup>ii</sup> At the current rate of improvement, the achievable benchmark could be attained in about 2.5 years.
- Males should reach the achievable benchmark in a little over 2 years, but females would not reach the benchmark for more than 4 years.

## References

1. Institute of Medicine. Crossing the quality chasm: a new health system for the 21st century. Washington, DC: National Academies Press; 2001.
2. 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.
3. Boudreau RM, McNally C, Rensing EM, et al. Improving the timeliness of written patient notification of mammography results by mammography centers. *Breast J* 2004 Jan-Feb;10(1):10-19.
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. Luman ET, Barker LE, Shaw KM, et al. Timeliness of childhood vaccinations in the United States: days undervaccinated and number of vaccines delayed. *Jama* 2005 Mar 9;293(10):1204-11.
8. Houck PM, Bratzler DW. Administration of first hospital antibiotics for community-acquired pneumonia: does timeliness affect outcomes? *Curr Opin Infect Dis* 2005 Apr;18(2):151-56.
9. 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.
10. 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.
11. Ramsey SD, Newton K, Blough D, et al. Patient-level estimates of the cost of complications in diabetes in a managed-care population. *Pharmacoecon* 1999 Sep;16(3):285-95.
12. Calculated from Web site: Agency for Healthcare Research and Quality. Healthcare Cost and Utilization Project. Kids' Inpatient Database. Rockville, MD. Available at: <http://hcupnet.ahrq.gov/>. Accessed April 24, 2009.
13. Niska R, Bhuiya F, Xu J, et al. National Hospital Ambulatory Medical Care Survey: 2007 emergency department summary. *Natl Health Stat Report* 2010 Aug 6;(26). Available at: <http://www.cdc.gov/nchs/data/nhsr/nhsr026.pdf>. Accessed January 20, 2011.
14. McCaig L, Nawar EW. National Hospital Ambulatory Medical Care Survey: 2004 emergency department summary. *Adv Data Vital Health Stat* 2006 June 23;(372). Available at: <http://www.cdc.gov/nchs/data/ad/ad372.pdf>. Accessed July 7, 2009.
15. 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.

<sup>i</sup> The top 5 States that contributed to the achievable benchmark are Massachusetts, Minnesota, North Carolina, Rhode Island, and South Carolina.

<sup>ii</sup> The top 5 States that contributed to the achievable benchmark are Arkansas, California, Georgia, Kentucky, and Tennessee.

## Chapter 5. Patient Centeredness

The Institute of Medicine identifies patient centeredness as a core component of quality health care.<sup>1</sup> 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.<sup>2</sup>

Patient centeredness “encompasses qualities of compassion, empathy, and responsiveness to the needs, values, and expressed preferences of the individual patient.”<sup>1</sup> In addition, translation and interpretation services facilitate communication between the provider and the patient and are often a legal requirement.<sup>1</sup> The patient-centered approach includes viewing the patient as a unique person, rather than focusing strictly on the illness, building a therapeutic alliance based on the patient's and the provider's perspectives.

Patient-centered care is supported by good provider-patient communication so that patients' needs and wants are understood and addressed and patients understand and participate in their own care.<sup>2-5</sup> This approach to care has been shown to improve patients' health and health care.<sup>3,4,6-8</sup> Unfortunately, many barriers exist to good communication.

Providers also differ in communication proficiency, including varied listening skills and different views from their patients' of symptoms and treatment effectiveness.<sup>9</sup> Additional factors influencing patient centeredness and provider-patient communication include:

- Language barriers.
- Racial and ethnic concordance between the patient and provider.
- Effects of disabilities on patients' health care experiences.
- Providers' cultural competency.

Efforts to remove these possible impediments to patient centeredness are underway within the Department of Health and Human Services (HHS). For example, the Office of Minority Health has developed a set of Cultural Competency Curriculum Modules that aim to equip providers with cultural and linguistic competencies to help promote patient-centered care.<sup>10, ii</sup> These modules are based on the National Standards on Culturally and Linguistically Appropriate Services. The standards are directed at health care organizations and aim to improve the patient centeredness of care for people with limited English proficiency (LEP). Another example, which is being administered by the Health Resources and Services Administration, is *Unified Health Communication*, a Web-based course for providers that integrates concepts related to health literacy with cultural competency and LEP.<sup>iii</sup>

<sup>i</sup> For example, Title VI of the Civil Rights Act of 1964, 42 U.S.C. 2000d, may require the practitioner or hospital to provide language interpreters and translate vital documents for limited-English-proficient persons. Section 504 of the Rehabilitation Act of 1973, 29 U.S.C. 794, may require the practitioner or hospital to provide sign language interpreters, materials in Braille, and/or accessible electronic formats for individuals with disabilities.

<sup>ii</sup> This online program (available at <http://www.thinkculturalhealth.org>) is accredited for Continuing Medical Education credits for physicians and Continuing Education Units for nurses and pharmacists.

<sup>iii</sup> This online program (available at <http://www.hrsa.gov/publichealth/healthliteracy/>) is accredited for Continuing Medical Education credits for physicians and Continuing Education Units for nurses, physician assistants, pharmacists, and Certified Health Education Specialists.



# Patient Centeredness

In addition, the HHS Office for Civil Rights has issued Guidance to Federal Financial Assistance Recipients Regarding Title VI Prohibition Against National Origin Discrimination Affecting Limited English Proficient Persons. This guidance explains that recipients of Federal financial assistance must take reasonable steps to provide LEP people with a meaningful opportunity to participate in HHS-funded programs. Failure to do so may violate the prohibition under Title VI of the Civil Rights Act of 1964, 42 U.S.C. 2000d, against national origin discrimination.<sup>11</sup>

## Importance

### Morbidity and Mortality

- Patient-centered approaches to care have been shown to improve patients' health status. These approaches rely on building a provider-patient relationship, improving communication, fostering a positive atmosphere, and encouraging patients to actively participate in provider-patient interactions.<sup>3, 4</sup>
- A patient-centered approach has been shown to lessen patients' symptom burden.<sup>6</sup>
- Patient-centered care encourages patients to comply with treatment regimens.<sup>8</sup>
- Patient-centered care can reduce the chance of misdiagnosis due to poor communication.<sup>7</sup>

### Cost

- Patient centeredness has been shown to reduce underuse and overuse of medical care.<sup>12</sup>
- Patient centeredness can reduce the strain on system resources and save money by reducing the number of diagnostic tests and referrals.<sup>6</sup>
- Although some studies have shown that being patient centered reduces medical costs and use of health service resources, others have shown that patient centeredness increases providers' costs, especially in the short run.<sup>13</sup>

## Measures

The National Healthcare Quality Report (NHQR) and the National Healthcare Disparities Report (NHDR) track several measures of patients' experience of care. The reports also include one priority and two goals recommended by the National Priorities Partnership (NPP). NPP identified patient and family engagement as one of six national priorities. The vision is health care "...that honors each individual patient and family, offering voice, control, choice, skills in self-care, and total transparency, and that can and does adapt readily to individual and family circumstances, and to differing cultures, languages, and social backgrounds." Key goals include enabling patients to effectively navigate and manage their care and enabling patients to make informed decisions about their treatment options.

# Patient Centeredness

The core measure presented in this report is adults and children who reported poor communication at the doctor's office. This measure is a composite of four measures—patients' 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. This measure is presented separately for adults and children.

In addition, the NHQR includes a supporting measure on adults who reported poor communication during a hospital stay. This measure is a composite of three measures—patients' assessments during a hospital stay of how often their doctors/nurses listened carefully to them, explained things clearly, and treated them with courtesy and respect. This measure is presented separately for communication with nurses and communication with doctors.

The measures related to the NPP goals are:

- Enabling patients to effectively navigate and manage their care.
  - Reading the instructions on a prescription bottle.
- Enabling patients to make informed decisions about their treatment options.
  - Understanding information from a doctor's office.
  - Enabling patient participation in treatment decisions.

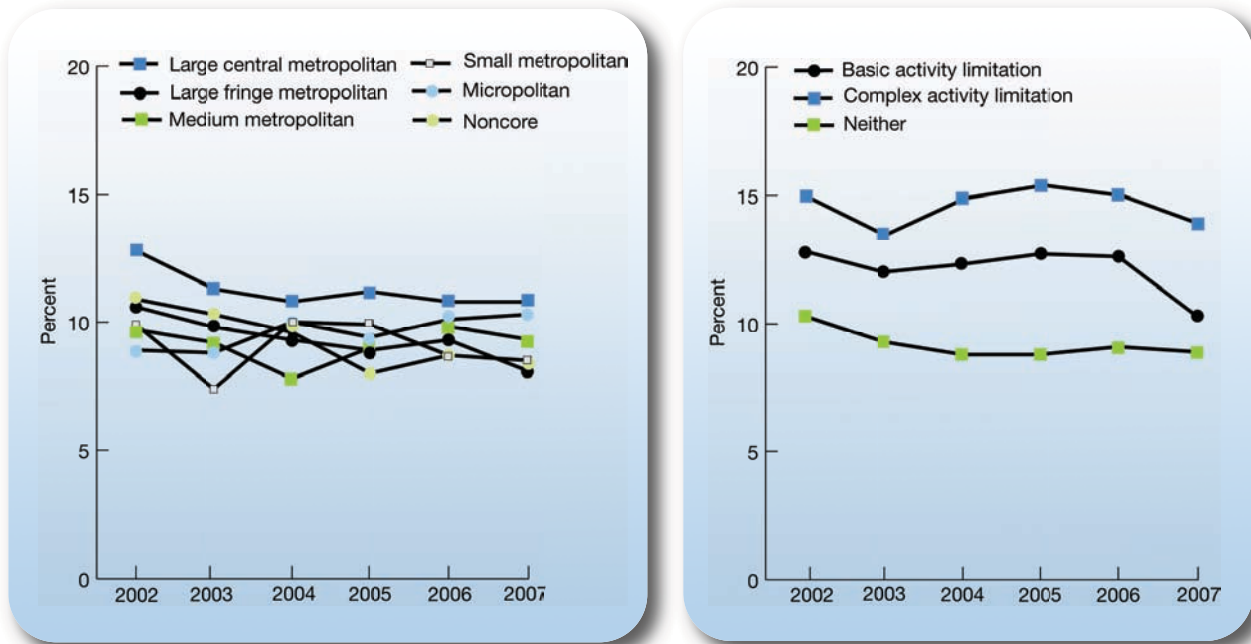
## Findings

### Patients' Experience of Care—Adults

Optimal health care requires good communication between patients and providers, yet barriers to provider-patient 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.

# Patient Centeredness

**Figure 5.1. Adults who had a doctor's office or clinic visit in the last 12 months who reported poor communication with health providers: Overall composite, by residence location and activity limitation, 2002-2007**



**Source:** Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2002-2007.

**Denominator:** Civilian noninstitutionalized population age 18 and over who had a doctor's office or clinic visit in the last 12 months.

**Note:** Patients who report that their health providers sometimes or never listened carefully, explained things clearly, showed respect for what they had to say, or spent enough time with them are considered to have poor communication.

- From 2002 to 2007, the percentage of adults with a doctor's office or clinic visit who reported poor communication significantly decreased, from 10.8% to 9.3% (data not shown).
- In 5 of 6 years, a significantly lower percentage of adults in large fringe metropolitan areas reported poor communication with their health providers than adults in large central metropolitan areas; 2006 was the exception (Figure 5.1).
- From 2002 to 2007, there was a significant decrease in the percentage of adults with a doctor's visit who reported poor communication in large fringe and large central metropolitan areas. Micropolitan residents were the only group to report an increase in the percentage of patients who reported poor communication.
- In all years, adults with basic or complex activity limitations were more likely to report poor communication than adults with neither basic nor complex activity limitations. In 2004, 2005, and 2007, a significantly higher percentage of adults with complex activity limitations reported poor communication than adults with basic activity limitations.
- From 2002 to 2007, the percentage of adults with a doctor's office or clinic visit who reported poor communication decreased from 12.8% to 10.3% for adults with basic activity limitations and decreased from 10.3% to 8.9% for adults with neither basic nor complex activity limitations.

# Patient Centeredness

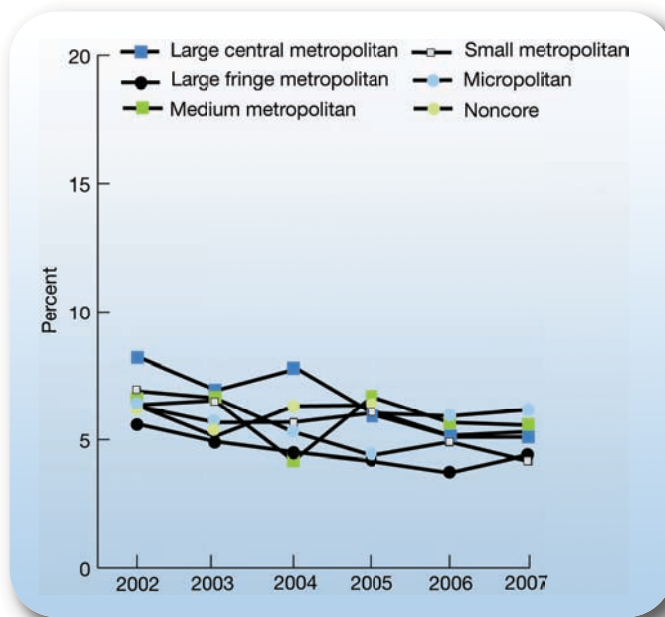
Also, in the NHDR:

- In all years, Hispanics were significantly more likely than non-Hispanic Whites to report poor communication.
- In most years, Black and Asian patients were more likely than White patients to report poor communication with health providers.

## Patients' Experience of Care—Children

Communication in children's health care can be challenging since the child's experiences are interpreted through the eyes of a parent or guardian. During a health care encounter, a responsible adult caregiver will be involved in communicating with the provider and interpreting decisions in an age-appropriate manner to the patient. 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 who had a doctor's office or clinic visit in the last 12 months whose parents reported poor communication with health providers: Overall composite, by residence location, 2002-2007**



**Source:** Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2002-2007.

**Denominator:** Civilian noninstitutionalized population under age 18 who had a doctor's office or clinic visit in the last 12 months.

**Note:** Parents who report that their child's health providers sometimes or never listened carefully, explained things clearly, showed respect for what they had to say, or spent enough time with them are considered to have poor communication. Data for noncore areas in 2006 did not meet criteria for statistical quality, confidentiality, or reliability.

- In 2007, 4.9% of parents of children who had a doctor's office or clinic visit in the last 12 months reported poor communication with health providers. This rate is a significant improvement over the 2002 rate of 6.7% (data not shown).
- The percentage reporting poor communication between 2002 and 2007 decreased significantly for children residing in large central and small metropolitan areas (Figure 5.2).

# Patient Centeredness

- In 4 of 6 years, a significantly lower percentage of parents residing in large fringe metropolitan areas reported poor communication with their health provider than did parents residing in large central metropolitan areas; 2006 and 2007 were the exceptions.

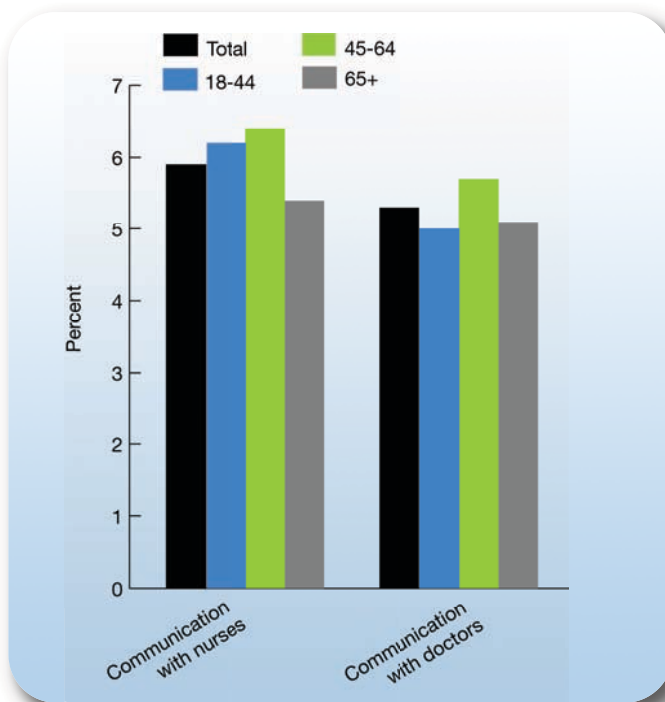
Also, in the NHDR:

- From 2002 to 2007, the difference in the percentage of children whose parents or guardians reported poor communication with their health providers remained significantly higher for Hispanics than for non-Hispanic Whites.
- In all years, poor and low-income parents were significantly more likely than high-income parents to report poor communication with their child's health provider.

## Patients' Experience of Care—Hospital

Using methods developed for the CAHPS® (Consumer Assessment of Healthcare Providers and Systems) survey,<sup>14</sup> the NHQR and NHDR use a composite measure that combines four measures of provider-patient communication into a single core measure. The composite measure presented includes data on providers who sometimes or never listened carefully, explained things clearly, respected what patients had to say, and spent enough time with patients. These data are presented separately for communication with doctors and communication with nurses.

**Figure 5.3. Adult hospital patients who reported poor communication with nurses and doctors, by age, 2007**



**Source:** Agency for Healthcare Research and Quality, Hospital Consumer Assessment of Health Plans Survey, 2007.

**Note:** Poor communication is defined as responded “sometimes” or “never” to the set of survey questions: “During this hospital stay, how often did doctors/nurses treat you with courtesy and respect?” “During this hospital stay, how often did doctors/nurses listen carefully to you?” and “During this hospital stay, how often did doctors/nurses explain things in a way you could understand?”

# Patient Centeredness

- Overall, 5.9% of adult hospital patients reported poor communication with nurses during their hospital stay and 5.3% reported poor communication with doctors (Figure 5.3).
- Compared with patients ages 18-44, patients age 65 and over were less likely to report poor communication with nurses.
- Compared with patients ages 18-44, patients ages 45-64 were more likely to report poor communication with doctors.

Also, in the NHDR:

- Compared with Whites, all minority groups were more likely to report poor communication with nurses.
- Blacks, American Indians and Alaska Natives, and patients of more than one race were more likely than Whites to report poor communication with doctors.
- Racial minorities, Hispanics, patients with less than a high school education, and patients who speak a language other than English at home were also more likely to report poor communication with nurses and doctors.

## Patient and Family Engagement: Enabling Effective Patient Navigation and Management of Care

To effectively navigate the complicated health care system, providers need to give patients access to culturally and linguistically appropriate tools to support patient engagement. Culturally and linguistically appropriate services (CLAS) are important components of effective health care delivery. It is vital for providers to understand patients' health care needs and for patients to understand providers' diagnosis and treatment recommendations. Communication barriers can relate to language, culture, and health literacy.

Health literacy is the capacity to obtain, process, and understand basic health information and services to make appropriate health decisions.<sup>15</sup> Patients with limited health literacy are more likely to have difficulties understanding and executing proper medication use. It has also been shown that communication barriers such as limited English proficiency are associated with lower quality of care and place patients at risk for poor clinical outcomes.<sup>16</sup>

About one-third of Americans are not "health literate."<sup>17, 18</sup> Individuals with inadequate health literacy incur higher medical costs and are more likely to have an inefficient mix of service use compared with those with adequate health literacy.<sup>19</sup> They may experience many difficulties, including:

- Less preventive care.<sup>20</sup>
- Poorer understanding of their conditions and care.<sup>17, 21, 22</sup>
- Higher use of emergency and inpatient services and higher rates of rehospitalization.<sup>23, 24</sup>
- Less adherence to medication schedules.<sup>23</sup>
- Less participation in medical decisionmaking.<sup>25</sup>



# Patient Centeredness

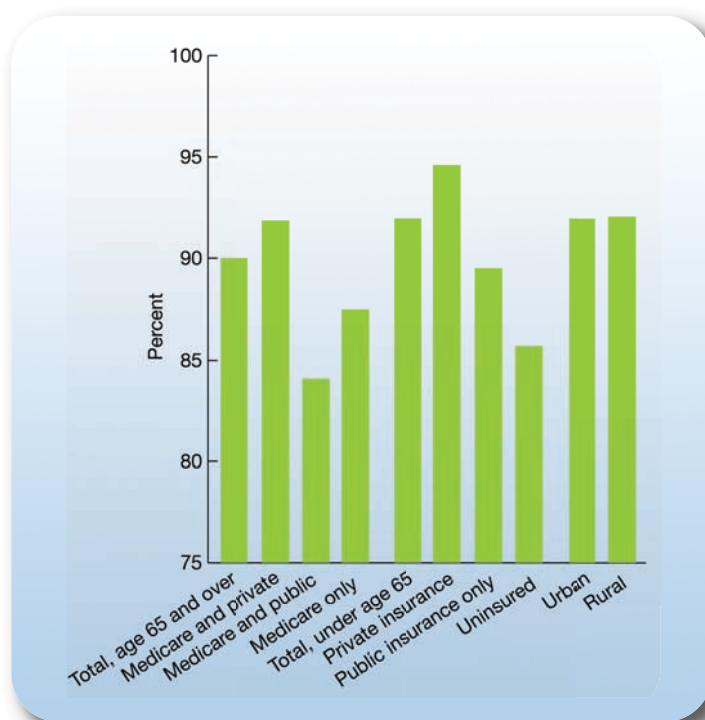
To fill the data gap that currently exists, we examined subnational data-gathering activities and identified the California Health Interview Survey (CHIS) as a unique source of this information. CHIS is conducted by the UCLA Center for Health Policy Research in collaboration with the California Department of Public Health, the Department of Health Care Services, and the Public Health Institute.

Every 2 years, CHIS involves random-dial telephone interviews with up to 50,000 California households. The people included in CHIS are a statistically representative sample of the entire State's diverse population. With each survey cycle, new households are selected to participate. Beginning in 2007, CHIS also includes a sample of cell-phone-only households, which are often younger and more mobile Californians frequently overlooked in land-line surveys.

## Reading the Instructions on a Prescription Bottle

The effectiveness of a prescription is due in large part to the patient's ability to follow dosing instructions correctly. If the patient misunderstands the amount of medication to be taken or the dosing schedule, an adverse event can occur. This is particularly true for patients taking multiple medications that require strict adherence to protocol. A patient's health literacy levels, cognitive abilities, or visual impairment can lead to an imprecise, unsafe medication regimen. It is important that health care providers not only rely on patient's assurance that they understand medication instructions, but also insist on having patients clearly demonstrate their understanding.

**Figure 5.4. Adults who found it easy to read the instructions on a prescription bottle, by insurance status and location, California, 2007**



**Source:** University of California, Los Angeles, Center for Health Policy Research, California Health Interview Survey, 2007.

# Patient Centeredness

- In 2007, patients age 65 and over insured by Medicare and public insurance in California were less likely than patients with Medicare and private insurance to find it easy to read the instructions on a prescription bottle (84.1% compared with 91.9%; Figure 5.4).
- In 2007 in California, patients under age 65 with public insurance and uninsured patients were less likely than patients with private health insurance to find it easy to read the instructions on a prescription bottle (89.5% and 85.7%, respectively, compared with 94.6%).

Also, in the NHDR:

- In 2007, patients in California who did not speak English well or at all were less likely than patients who only speak English to find it easy to read the instructions on a prescription bottle.

## Patient and Family Engagement: Enabling Patients To Make Informed Decisions About Their Treatment Options

The NPP recommends that health care organizations and their staff use proven, culturally and linguistically appropriate strategies and tools to enable patients to understand all treatment options and to make decisions consistent with their values and preferences.

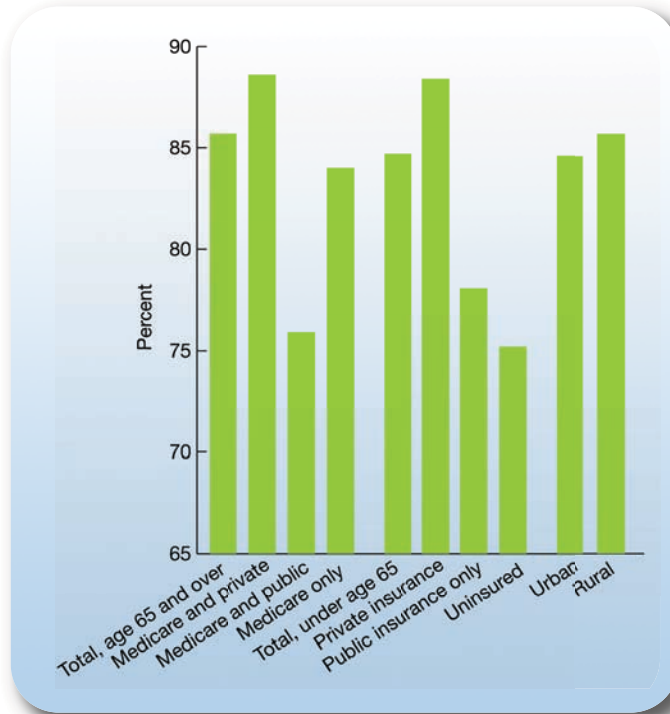
### Understanding Information From a Doctor's Office

Recovery from illness and disease self-management depend in large part on patients' ability to follow their doctors' instructions at home. Patients can sometimes leave their health care provider's office thinking they understand the instructions given to them only to realize later that some information is unclear. It is important that both patients and physicians not assume that instructions are understood but develop a means to show comprehension.



# Patient Centeredness

**Figure 5.5. Adults who found it easy to understand written information from a doctor's office, by insurance status and location, California, 2007**



**Source:** University of California, Los Angeles, Center for Health Policy Research, California Health Interview Survey, 2007.

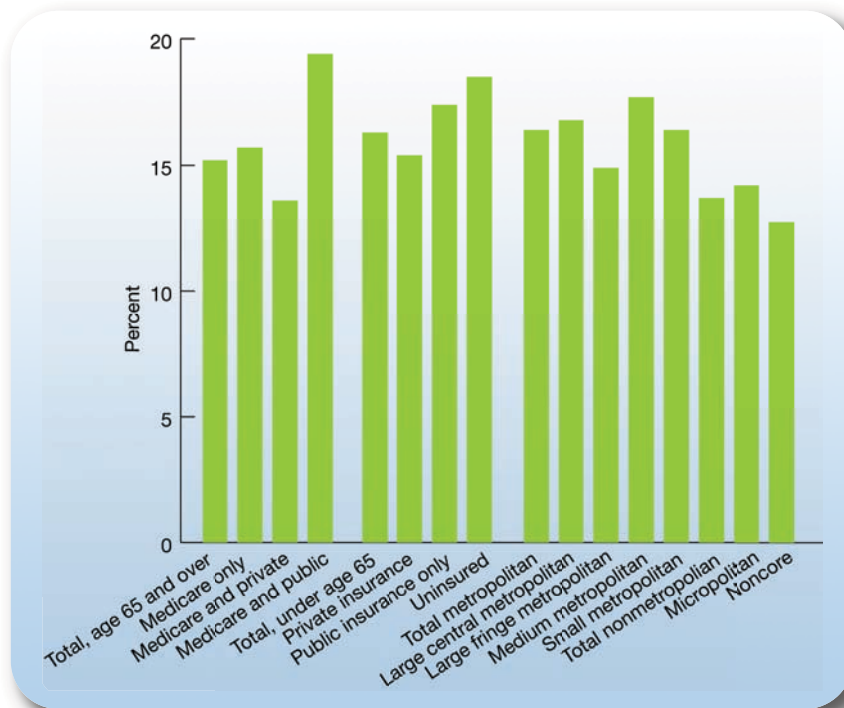
- In 2007, California patients age 65 and over with Medicare and private insurance were significantly more likely than patients with Medicare only and those with Medicare and public insurance to find it easy to understand written information from a doctor's office (88.6% compared with 84.0% and 75.9%, respectively; Figure 5.5).
- In 2007, patients under age 65 with private health insurance were significantly more likely than patients with public insurance and uninsured patients to find it is easy to understand written information from a doctor's office (88.4% compared with 78.1% and 75.2%, respectively).
- In 2007, there were no statistically significant differences between the percentage of patients in urban and rural areas of California who found it easy to understand written information from a doctor's office.

# Patient Centeredness

## Providers Asking Patients To Assist in Making Treatment Decisions

The high prevalence of chronic disease has placed more responsibility on patients. Conditions such as diabetes and hypertension require self-management by patients. It is vital that patients are provided with information that allows them to make informed decisions and feel engaged in their treatment and that it incorporates their values and preferences.

**Figure 5.6. Adults with a usual source of care whose health providers sometimes or never asked for the patient's help to make treatment decisions, by insurance status and location, 2007**



**Source:** Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2007.

- In 2007, patients under age 65 who were uninsured were significantly more likely than patients with private health insurance to have a usual source of care who did not ask for their help in making treatment decisions (18.5% compared with 15.4%; Figure 5.6).
- In 2007, patients age 65 and over with Medicare and public insurance were significantly more likely than patients with Medicare and private insurance to have a usual source of care not ask for their help in making treatment decisions (19.4% compared with 13.6%).
- In 2007, patients living in metropolitan areas were significantly more likely than patients living in nonmetropolitan areas to have a usual source of care not ask for their help in making treatment decisions (16.4% compared with 13.7%).

Also, in the NHDR:

- In 2007, patients who most often spoke English at home were significantly more likely than patients who mostly spoke another language at home to have a usual source of care always ask for the patient's help to make treatment decisions (61.6% compared with 51.9%).

# Patient Centeredness

## References

1. Institute of Medicine. Crossing the quality chasm: a new health system for the 21st century. Washington, DC: National Academies Press; 2001.
2. Institute of Medicine. Envisioning the National Health Care Quality Report. 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):80-82.
5. Michie S, Miles J, Weinman J. Patient-centeredness in chronic illness: what is it and does it matter? *Patient Educ Couns* 2003 Nov;51(3):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. DiMatteo MR. The role of the physician in the emerging health care environment. *West J Med* 1998 May;168(5):328-33.
8. Beck RS, 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.
9. Rhoades DR, McFarland KF, Finch WH, et al. Speaking and interruptions during primary care office visits. *Fam Med* 2001 Jul-Aug;33(7):528-32.
10. U.S. Department of Health and Human Services, Office of Minority Health. Think Cultural Health: bridging the health care gap through cultural competency continuing education programs. Available at: [www.thinkculturalhealth.hhs.gov](http://www.thinkculturalhealth.hhs.gov). Accessed November 6, 2008.
11. U.S. Department of Health and Human Services, Office for Civil Rights. Guidance to Federal financial assistance recipients regarding Title VI prohibition against national origin discrimination affecting limited English proficient persons. 68 Fed. Reg. 47311-02; August 2, 2008. Available at: <http://www.hhs.gov/ocr/civilrights/resources/specialtopics/lep/factsheetguidanceforlep.html>. Accessed April 24, 2009.
12. 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.
13. Bechel DL, Myers WA, Smith DG. Does patient-centered care pay off? *Jt Comm J Qual Improv* 2000 Jul;26(7):400-9.
14. Hargraves JL, Hays RD, Cleary PD. Psychometric properties of the Consumer Assessment of Health Plans Study (CAHPS) 2.0 adult core survey. *Health Serv Res* 2003 Dec;38(6 Pt 1):1509-27.
15. Healthy People 2010. 2nd ed. 2 vols. Washington, DC: U.S. Department of Health and Human Services; 2000. Available at: <http://www.healthypeople.gov/2010/>. Accessed August 17, 2009.
16. Ngo-Metzger Q, Sorkin DH, Phillips RS, et al. Providing high-quality care for limited English proficient patients: the importance of language concordance and interpreter use. *J Gen Intern Med* 2007 Nov;22 Suppl 2:324-30.
17. Gazmararian JA, Williams MV, Peel J, et al. Health literacy and knowledge of chronic disease. *Patient Educ Couns* 2003 Nov;51(3):267-75.
18. Parker RM, Ratzan SC, Lurie N. Health literacy: a policy challenge for advancing high-quality health care. *Health Aff (Millwood)* 2003 Jul-Aug;22(4):147-53.
19. Howard DH, Gazmararian J, Parker RM. The impact of low health literacy on the medical costs of Medicare managed care enrollees. *Am J Med* 2005 Apr;118(4):371-7.
20. Scott TL, Gazmararian JA, Williams MV, et al. Health literacy and preventive health care use among Medicare enrollees in a managed care organization. *Med Care* 2002 May;40(5):395-404.
21. Williams MV, Baker DW, Parker RM, et al. Relationship of functional health literacy to patients' knowledge of their chronic disease. A study of patients with hypertension and diabetes. *Arch Intern Med* 1998 Jan 26;158(2):166-72.

# Patient Centeredness

22. Williams MV, Baker DW, Honig EG, et al. Inadequate literacy is a barrier to asthma knowledge and self-care. *Chest* 1998 Oct;114(4):1008-15.
23. Baker DW, Parker RM, Williams MV, et al. Health literacy and the risk of hospital admission. *J Gen Intern Med* 1998 Dec;13(12):791-98.
24. Baker DW, Gazmararian JA, Williams MV, et al. Functional health literacy and the risk of hospital admission among Medicare managed care enrollees. *Am J Public Health* 2002 Aug;92(8):1278-83.
25. Berkman N, DeWalt D, Pignone M, et al. Literacy and health outcomes. Summary. Evidence Report/Technology Assessment No. 87. Rockville, MD: Agency for Healthcare Research and Quality; 2004. Publication No. AHRQ 04-E007-1.





## Chapter 6. Care Coordination

Health care in the United States is often fragmented. Clinical services are frequently organized around small groups of providers functioning autonomously and specializing in specific symptoms or organ systems. Therefore, many patients receive attention only for individual health conditions rather than receiving coordinated care for their overall health. For example, the typical Medicare beneficiary sees two primary care providers and five specialists each year.<sup>1</sup> Communication of important information among providers and between providers and patients may entail delays or inaccuracies or fail to occur at all.

Care coordination is a conscious effort to ensure that all key information needed to make clinical decisions is available to patients and providers. It is defined as the deliberate organization of patient care activities between two or more participants involved in a patient's care to facilitate appropriate delivery of health care services.<sup>2</sup> It is multidimensional and essential to preventing adverse events, ensuring efficiency, and making care patient centered.<sup>3</sup> Patients in greatest need of care coordination include those with multiple chronic medical conditions, concurrent care from several health professionals, or many medications and patients undergoing extensive diagnostic workups or transitions from one setting of care to another. Effective care coordination requires well-defined multidisciplinary teamwork principled on the notion that all who interact with a patient must work together to ensure the delivery of safe, high-quality care.

### Importance

#### Morbidity and Mortality

- Care coordination interventions have been shown to:
  - Reduce mortality among patients with heart failure.
  - Reduce mortality and dependency among patients with stroke.
  - Reduce symptoms among patients with depression and at the end of life.
  - Improve glycemic control among patients with diabetes.<sup>2</sup>

#### Cost

- Care coordination interventions have been shown to:
  - Reduce hospitalizations among patients with heart failure.
  - Reduce readmissions among patients with mental health conditions.
  - Be cost-effective when applied to treatment of depression.<sup>2</sup>

### Measures

The National Priorities Partnership (NPP) identified care coordination as one of six national priorities for health care.<sup>4</sup> The vision is health care that “guides patients and families through their healthcare experience,

# Care Coordination

while respecting patient choice, offering physical and psychological supports, and encouraging strong relationships between patients and the healthcare professionals accountable for their care.” While measurement of care coordination is at an early stage in development, key goals include coordinating transitions of care, reducing hospital readmissions, communicating medication information, and reducing preventable emergency department visits.

Measures reported in this chapter are organized around these NPP goals:

- Transitions of care
  - Adequate hospital discharge information.
- Hospital readmissions
  - Readmissions for congestive heart failure.
- Medication information
  - Provider asks about medications from other doctors.
  - Hospital electronic exchange of medication history.
- Preventable emergency department visits
  - Emergency department visits for asthma.

In addition, this chapter presents information from the National Survey of Children’s Health on effective care coordination and having a medical home.

## Findings

### Transitions of Care

#### Management: Complete Written Discharge Instructions

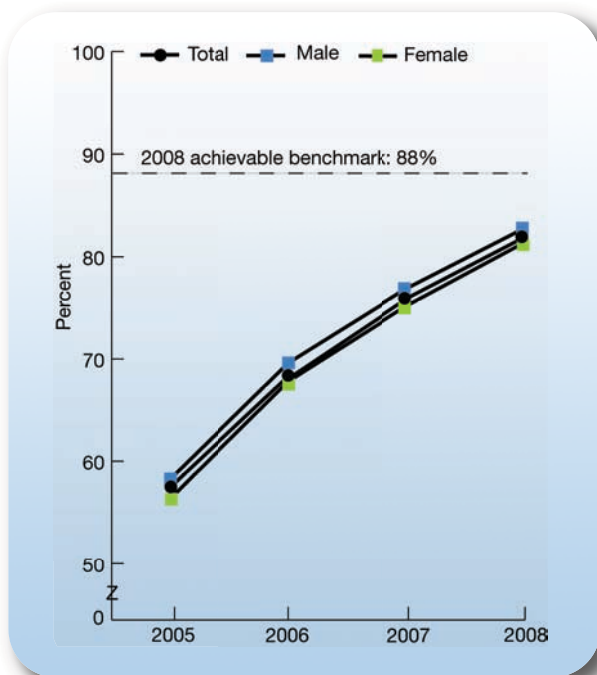
As health care conditions and needs change, patients often need to move from one setting to another. These transitions of care place patients at heightened risk of adverse events. Important information may be lost or miscommunicated as responsibility is delivered to new parties.

Effective care coordination begins with ensuring that accurate clinical information is available to support medical decisions by patients and providers. A common transition of care is discharge from the hospital. Giving patients and caregivers self-management support after discharge has been shown to reduce readmissions to the hospital and lower costs.<sup>5</sup>

Discharge from a hospital typically indicates improvement in a patient’s condition so that the patient no longer requires inpatient care. It also means that the patient and family must resume responsibility for the patient’s daily activities, diet, medications, and other treatments. The patient also needs to visit his or her personal doctor and know what to do if his or her condition deteriorates. Written discharge instructions are critical to help ensure that a patient receives the information needed to stay healthy after leaving the hospital.

# Care Coordination

**Figure 6.1. Hospitalized adult patients with heart failure who were given complete written discharge instructions, by gender, 2005-2008**



**Source:** Centers for Medicare & Medicaid Services, Quality Improvement Organization Program, 2005-2008.

**Denominator:** Hospitalized adult patients with a principal discharge diagnosis of heart failure.

**Note:** Complete written discharge instructions needed to address all of the following: activity level, diet, discharge medications, followup appointment, weight monitoring, and actions to take if symptoms worsen.

- From 2005 to 2008, the percentage of hospitalized adult patients with heart failure who were given complete written discharge instructions improved from 57.5% to 82.0% (Figure 6.1). Improvements were observed among both males and females.
- Statistically significant differences by sex were not observed.
- The 2008 top 5 State achievable benchmark was 88%.<sup>i</sup> At the current 12% annual rate of increase, this benchmark could be attained overall and for both males and females in less than a year.

Also, in the NHDR:

- In all years, American Indians and Alaska Natives were less likely to receive complete written discharge instructions compared with Whites and would require almost 3 years to reach the benchmark rate.

<sup>i</sup> The top 5 States that contributed to the achievable benchmark are Colorado, Delaware, New Hampshire, New Jersey, and Utah.

# Care Coordination

## Hospital Readmissions

### Outcome: Readmissions for Congestive Heart Failure

After discharge from the hospital for a chronic condition such as congestive heart failure (CHF), many patients will be rehospitalized. Rehospitalization signals a worsened state of illness and may reflect care that is not optimally coordinated. Rehospitalization also has significant cost implications since it is much more resource intensive than outpatient treatment.

Although not all rehospitalizations for CHF can be prevented, the risk of rehospitalization may increase when patients do not follow their discharge instructions. After discharge, patients need to take their medications regularly, adhere to recommendations related to diet and activity, monitor their weight, and look for signs and symptoms that their CHF is not under good control. When patients do not receive written discharge instructions that they understand, they may be less able to follow them. In addition, postdischarge care should be coordinated with patients' primary care physician. Patients will need to arrange followup visits with their primary care physician, who can adjust medications early to help prevent rehospitalization.

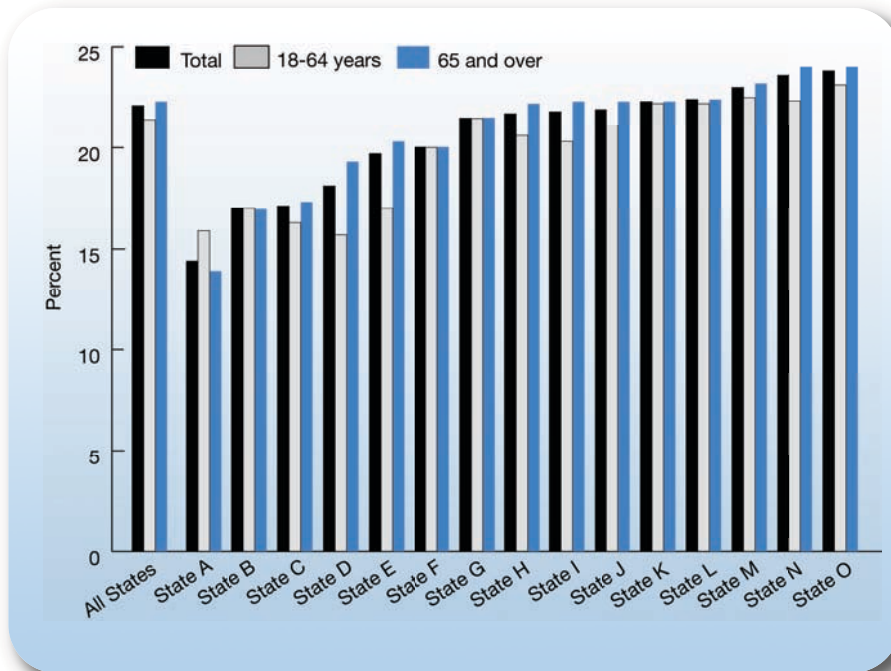
The estimates below are derived from data for 15 States participating in the Healthcare Cost and Utilization Project (HCUP) State Inpatient Databases. They are based on all CHF admissions from January 1 to November 30, 2007. Rehospitalizations are defined as admissions to any hospital in that State with any principal or secondary diagnosis of CHF within 30 days of the discharge date of an index CHF admission.

In previous years, we reported on readmissions with a principal diagnosis of CHF only, so comparisons with previous reports would not be appropriate. It is also important to note that the figures reported below are not national estimates. The States in the analysis account for about one-third of all adult discharges for CHF in the Nation and may provide an indication of patterns in CHF readmissions.

Costs of CHF rehospitalizations were also examined. Total hospital charges were converted to costs using HCUP cost-to-charge ratios based on hospital accounting reports from the Centers for Medicare & Medicaid Services. Cost estimates refer to hospital costs and do not include costs of physician services. In these 15 States, the average cost per CHF readmission was almost \$13,000 and the total cost was more than \$880 million.

# Care Coordination

Figure 6.2. Rehospitalization for congestive heart failure, by age and State, 15 States, 2007



**Source:** Agency for Healthcare Research and Quality, Healthcare Cost and Utilization Project, State Inpatient Databases, 2007.  
**Denominator:** Patients hospitalized for congestive heart failure.

- The percentage of State-level CHF hospitalizations resulting in rehospitalization for CHF ranged from a low of 14% to a high of 24% (Figure 6.2).
- Overall, rehospitalization rates did not vary by age. Rates were higher among patients ages 18-64 compared with patients age 65 and over in State A, but the reverse was true in States D and E.

Also, in the NHDR:

- Across 13 States with data on race and ethnicity, Blacks had higher CHF rehospitalization rates than Whites.

## Medication Information

Patients often seek care from many providers, and different providers may prescribe medications for the same patient. Patients are responsible for keeping track of all their medications, but medication information can be confusing, especially for patients on multiple medications. When care is not well coordinated and each provider is not aware of all the medications a patient is taking, patients are at greater risk for adverse drug interactions and adverse events related to overdosing or underdosing. In addition, providers need to periodically review all of a patient's medications to ensure that they are taking what is needed and only what is needed. Medication reconciliation has been shown to reduce both medication errors and adverse drug events.<sup>6</sup>

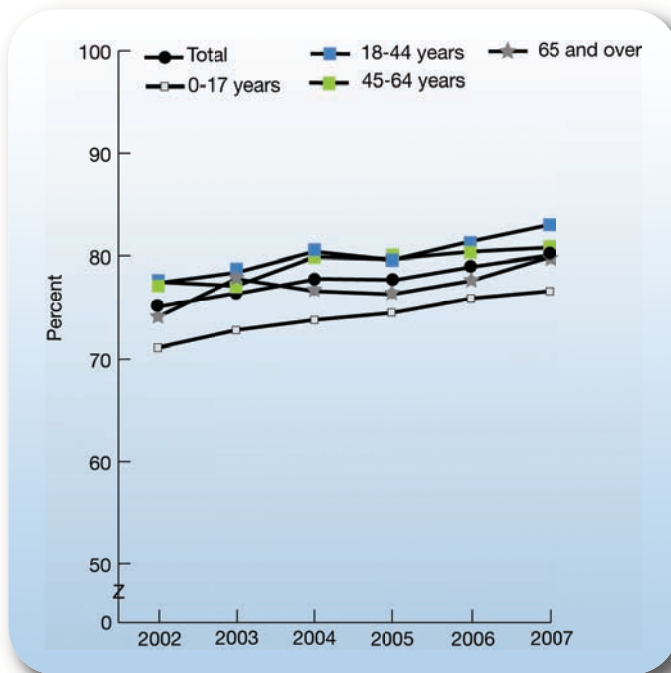


# Care Coordination

## Management: Provider Asks About Medications From Other Doctors

Medication information generated in different settings may not be sent to a patient's primary care provider. In the absence of communication from other providers, the patient is the primary source of medication information. Actively gathering and managing all of a patient's medical information is an important part of care coordination.

**Figure 6.3. People with a usual source of care whose health provider usually asks about prescription medications and treatments from other doctors, by age, United States, 2002-2007**



**Source:** Agency for Healthcare Research and Quality, Center for Financing, Access, and Cost Trends, Medical Expenditure Panel Survey, 2002-2007.

**Denominator:** Civilian noninstitutionalized population who report a usual source of care.

- From 2002 to 2007, the percentage of people with a usual source of care whose health provider usually asked about prescription medications and treatments from other doctors improved from 75% to 80% (Figure 6.3). Improvements were observed among all age groups.
- In all years, the health providers of children were less likely to ask about medications from other doctors. In all years except 2003, the health providers of older adults were also less likely to ask about medications from other doctors.

Also, in the NHDR:

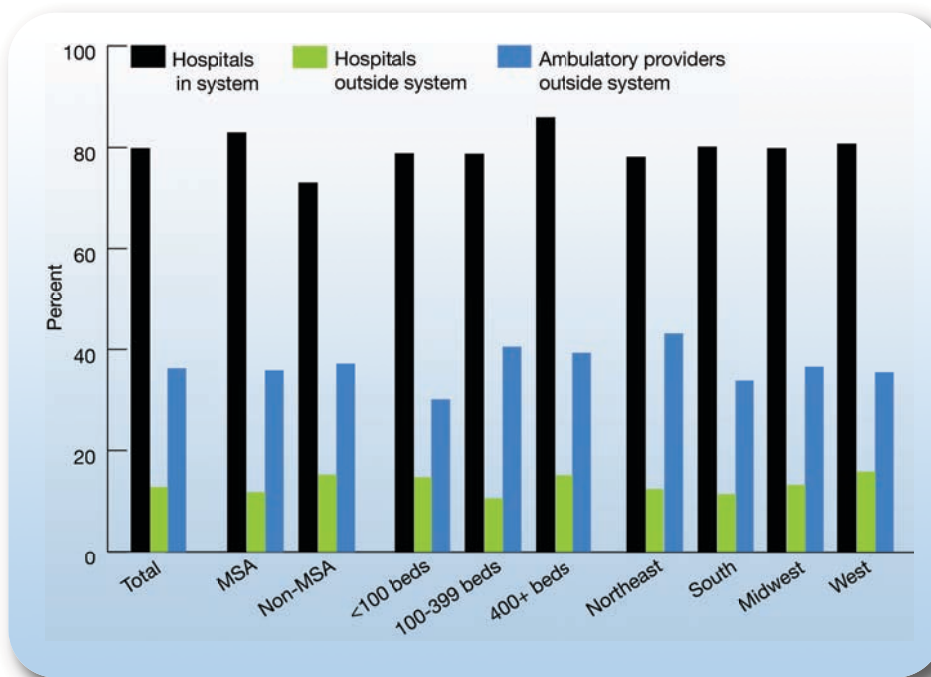
- Consistent disparities related to race, ethnicity, or income were not observed. In most years, providers of people with less than a high school education were less likely to ask about medication from other doctors compared with providers of people with any college education.

# Care Coordination

## Structure: Electronic Exchange of Medication Information

Ideally, information about medications prescribed for a patient by one provider would be available to all providers taking care of that patient. One way to exchange this information efficiently is to build this function into health information technologies. The American Hospital Association recently surveyed hospitals about their use of health information technologies. Questions about whether a hospital electronically exchanged patient information on medication history with other providers were included and 1,963 hospitals responded.

**Figure 6.4. Hospitals with electronic exchange of patient information on medication history, by urban-rural location, bed size, and region, 2008**



**Key:** MSA = metropolitan statistical area.

**Source:** American Hospital Association Annual Survey Information Technology Supplement, 2008.

- Overall, 80% of hospitals electronically exchanged patient information on medication history with other hospitals in their system, 13% exchanged information with hospitals outside their system, and 36% exchanged information with ambulatory providers outside their system (Figure 6.4).
- Hospitals outside of metropolitan statistical areas (MSAs) were less likely than metropolitan hospitals to exchange information with hospitals in their system but more likely to exchange information with hospitals outside their system.
- Hospitals with <100 or 100-399 beds were less likely than large hospitals to exchange information with hospitals in their system. Hospitals with <100 beds were also less likely than large hospitals to exchange information with ambulatory providers outside their system.

# Care Coordination

- Hospitals in the South were less likely than hospitals in the Northeast to exchange information with ambulatory providers outside their system. Other regional differences were not statistically significant.

Also, in the NHDR:

- Hospitals with residency programs were more likely than nonteaching hospitals to exchange information with hospitals in their system. Federal hospitals were most likely to exchange information with hospitals in their system and least likely to exchange information with ambulatory providers outside their system.

## Preventable Emergency Department Visits

Potentially preventable, high-cost encounters with the medical system occur not only in hospitals, but also in emergency departments (EDs). There were more than 125 million ED encounters in 2008.<sup>7</sup> ED crowding, boarding (i.e., holding patients until an inpatient bed is available), and ambulance diversion have become more prevalent and have given rise to increasing concerns about the quality of care delivered in EDs.

Some hospitalizations and ED encounters cannot be avoided, but appropriate ambulatory care can help keep some patients from having to visit an ED or from being hospitalized. Reducing potentially avoidable ED encounters, in particular, holds promise for reducing cost, improving quality, and enhancing efficiency.

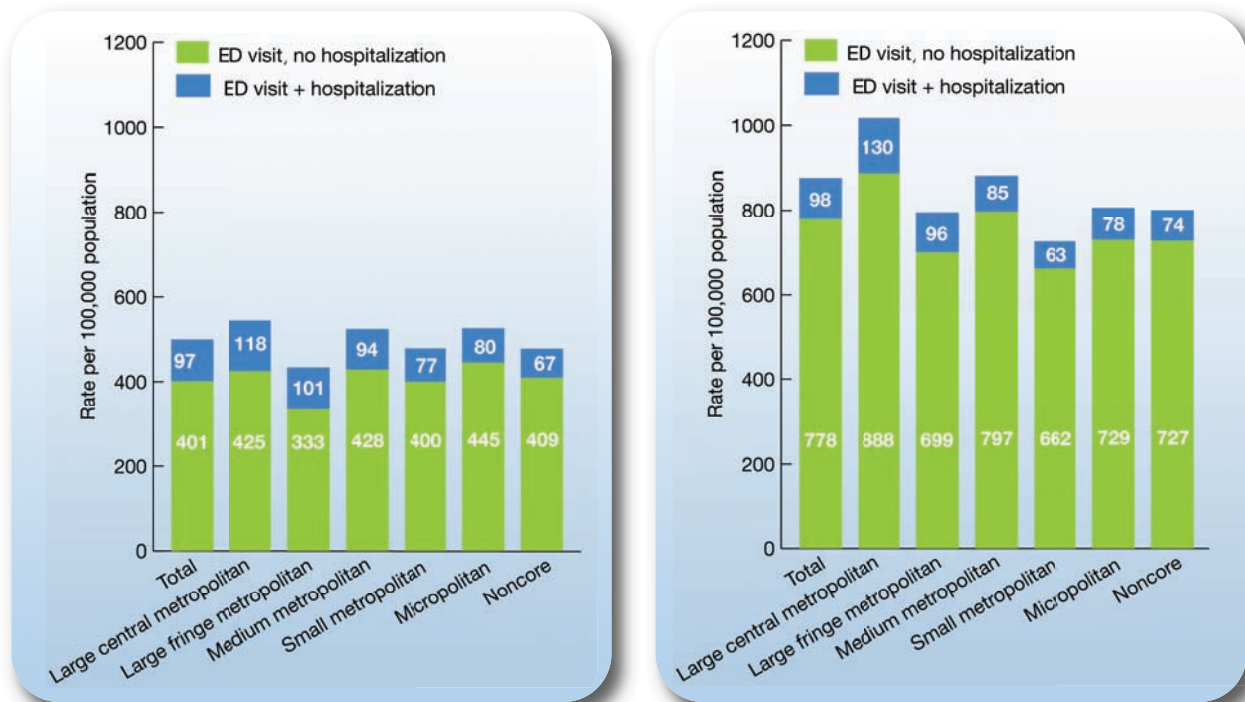
## Outcome: Emergency Department Visits for Asthma

Asthma is an ambulatory care-sensitive condition. Patients typically need to avoid environmental conditions that exacerbate their asthma, take their medications regularly, and monitor their symptoms. Good primary care can help patients with self-management and treatment adjustments before exacerbations of asthma become severe and require emergent attention. For this analysis, the adult and pediatric asthma measures from the AHRQ Pediatric Quality Indicator (PQI) software were applied to the 2007 HCUP Nationwide Emergency Department Sample (NEDS).



# Care Coordination

**Figure 6.5. Potentially avoidable emergency department encounters for asthma among adults (left) and children (right), by urban-rural location, 2007**



**Key:** ED = emergency department.

**Source:** Agency for Healthcare Research and Quality, Healthcare Cost and Utilization Project, Nationwide Emergency Department Sample, 2007.

**Denominator:** U.S. population.

**Note:** Annual rates are adjusted for age and gender.

- Overall, the rate of ED visits for asthma was 498 per 100,000 among adults (Figure 6.5). About 20% of ED visits for asthma among adults led to hospitalization (97 per 100,000) and 80% had other dispositions (401 per 100,000).
- Compared with adult residents of large fringe metropolitan counties (typically suburbs of large central metropolitan counties), residents of small metropolitan, micropolitan, and noncore<sup>ii</sup> counties had lower rates of ED visits for asthma that led to hospitalization.
- Compared with adult residents of large fringe metropolitan counties, residents of large central metropolitan, medium metropolitan, micropolitan, and noncore counties had higher rates of ED visits that did not end in hospitalization.
- Overall, the rate of ED visits for asthma was 876 per 100,000 among children, higher than the adult rate. Only about 11% of ED visits for asthma among children led to hospitalization (98 per 100,000) and 89% had other dispositions (778 per 100,000).
- Compared with children living in large fringe metropolitan counties, children living in small metropolitan counties had lower rates of ED visits for asthma that led to hospitalization. Differences in ED visits that did not end in hospitalization were not statistically significant across urban-rural locations.

<sup>ii</sup> Noncore areas are outside of metropolitan or micropolitan statistical areas. Micropolitan and noncore areas are typically regarded as “rural.”

# Care Coordination

Also, in the NHDR:

- Compared with adult residents of high-income neighborhoods, residents of all other income quartiles had higher rates of both ED visits for asthma that led to hospitalization and visits that did not end in hospitalization.
- Compared with children living in high-income neighborhoods, children living in the lower two income quartiles had higher rates of both ED visits for asthma that led to hospitalization and visits that did not end in hospitalization.

## Focus on Care Coordination for Children

Children often have unique care coordination needs. Some children have or are at increased risk for chronic physical, developmental, behavioral, or emotional conditions. They may need services not only from medical specialists, but also from other therapists (e.g., nutritionists, occupational therapists, mental health care providers) and educational specialists. Therefore, appropriate and timely coordination of care across multiple providers may be particularly important during childhood.

Previously, the reports have presented information about care coordination for children using data from the National Surveys of Children With Special Health Care Needs. This year, we show information from the 2007 National Survey of Children's Health. This survey was sponsored by the Maternal and Child Health Bureau of the Health Resources and Services Administration and conducted by the National Center for Health Statistics of the Centers for Disease Control and Prevention. It collected information by telephone on more than 90,000 children under age 18, about 1,700 per State.

Two measures related to care coordination are presented here. One measure focuses on families who needed extra help arranging or coordinating a child's health care with two or more providers. Families that reported that they usually or always got as much help as needed in arranging or coordinating the child's health care were considered to have effective care coordination.

The second measure focuses on the medical home. The patient-centered medical home is one approach to organizing care around a person and helping each person stay as healthy as possible. A key characteristic of a medical home is a personal physician leading a team of health care professionals. These professionals collectively take responsibility for providing all the services that a patient needs or arranging for and coordinating care provided by others. In addition to coordinating care, medical homes provide care that is accessible, family centered, continuous, comprehensive, compassionate, and culturally effective.<sup>8</sup>

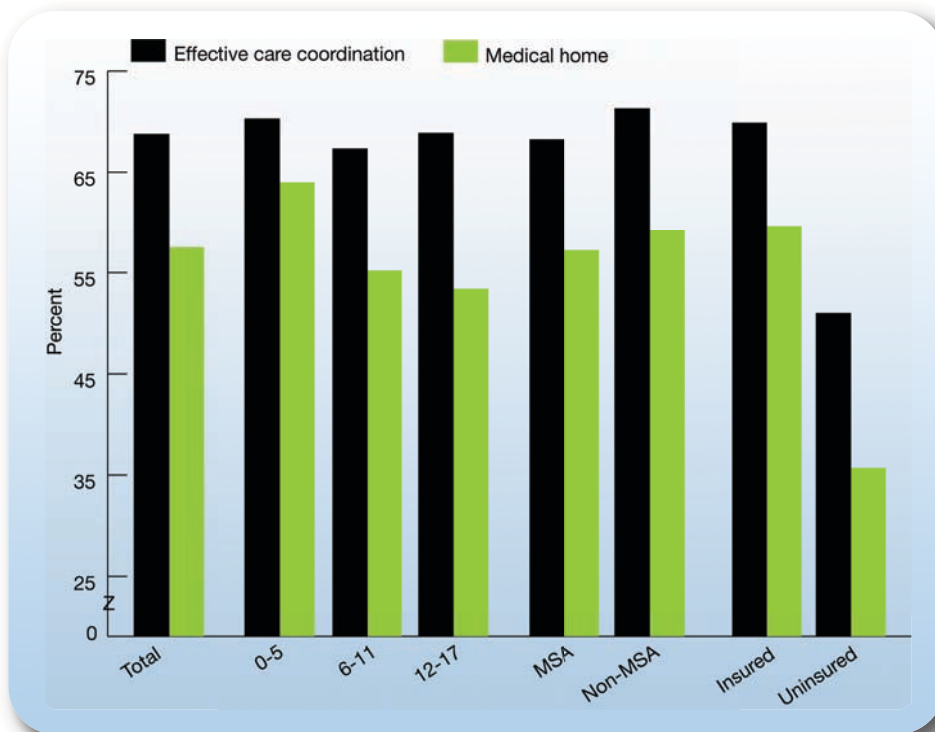
In the 2007 National Survey of Children's Health, several questions were asked to determine whether a child had a medical home:

- First, a child had to have a personal doctor or nurse.
- The presence or absence of family-centered, compassionate, and culturally effective care was assessed through a series of questions about the relationship between the provider and the child and family.
- Comprehensive and accessible care was assessed by whether the child had a usual source of care (other than an emergency room) when sick or when parents needed advice and by the ease of receiving needed referrals.

# Care Coordination

- Coordinated care was assessed among children using health services from more than one health care provider by whether the child received needed help with coordinating that care and reported good communication across providers and between medical providers and schools.
- Continuous care, usually assessed by the length of relationship with the primary doctor or nurse, was not directly measured in the survey.<sup>9</sup>

**Figure 6.6. Children with effective care coordination and with a medical home, by age, residence location, and insurance, 2007**



**Key:** MSA = metropolitan statistical area.

**Source:** Health Resources and Services Administration, Maternal and Child Health Bureau; Centers for Disease Control and Prevention, National Center for Health Statistics, National Survey of Children's Health, 2007.

**Denominator:** Children under 18.

**Note:** Analyses performed by the Child and Adolescent Health Measurement Initiative, Data Resource Center for Child and Adolescent Health (<http://childhealthdata.org>).

- Overall, among families who needed extra help arranging or coordinating a child's health care with two or more providers, only 69% reported receiving effective care coordination (Figure 6.6).
- Children living in MSAs were less likely than children living outside MSAs and uninsured children were less likely than insured children to receive effective care coordination.
- Overall, 58% of children had a medical home.
- Children ages 0-5 were more likely than children ages 12-17 to have a medical home.
- Uninsured children were less likely than insured children to have a medical home.



# Care Coordination

Also, in the NHDR:

- Black, Asian, and Hispanic children were less likely than White children and Hispanic children who speak Spanish at home were less likely than Hispanic children who speak English at home to have effective care coordination or a medical home. Of groups shown, Hispanic children who speak Spanish at home were least likely to receive effective care coordination or to have a medical home.

## References

1. Bodenheimer T. Coordinating care—a perilous journey through the health care system. *N Engl J Med* 2008 Mar 6;358(10):1064-71.
2. Shojania K, McDonald K, Wachter R, et al. Closing the quality gap: a critical analysis of quality improvement strategies—Volume 7: Care Coordination. Rockville, MD: Agency for Healthcare Research and Quality; 2007. AHRQ Publication No. 04(07)-0051-7. Available at: <http://www.ahrq.gov/clinic/tp/caregapt.htm>. Accessed November 5, 2010.
3. Powell-Davies G, Williams AM, Larsen K, et al. Coordinating primary health care: an analysis of the outcomes of a systematic review. *Med J Aust* 2008 Apr 21;188(8 Suppl):S65-S68.
4. National Priorities Partnership. National priority: care coordination. Available at: <http://www.nationalprioritiespartnership.org/uploadedFiles/NPP/Priorities/4.pdf>. Accessed Nov 5, 2010.
5. Coleman EA, Parry C, Chalmers S, et al. The care transitions intervention: results of a randomized controlled trial. *Arch Intern Med* 2006 Sep 25;166(17):1822-8.
6. Whittington J, Cohen H. OSF Healthcare's journey in patient safety. *Qual Manag Health Care* 2004 Jan-Mar;13(1):53-59.
7. Weighted national estimates from HCUP Nationwide Emergency Department Sample. Rockville, MD: Agency for Healthcare Research and Quality; 2008. Available at: <http://hcupnet.ahrq.gov/>. Accessed November 3, 2010.
8. American Academy of Pediatrics, Medical Home Initiatives for Children With Special Health Care Needs Project Advisory Committee. Policy statement: the medical home. *Pediatrics* 2002 July;110(1):184-6.
9. Child and Adolescent Health Measurement Initiative (Oregon Health & Science University). Measuring medical home for children and youth: methods and findings from the National Survey of Children With Special Health Care Needs and the National Survey of Children's Health; 2009. Available at: <http://medicalhomedata.org/ViewDocument.aspx?item=436>. Accessed November 5, 2010.



## Chapter 7. Efficiency

Health care cost increases continue to outpace the rise in wages, inflation, and economic growth. One approach to containing the growth of health care costs is to improve the efficiency of the health care delivery system. This would allow finite health care resources to be used in ways that best support high-quality care. Recent work examining variations in Medicare spending and quality shows that higher cost providers do not necessarily provide higher quality care, illustrating the potential for improvement.<sup>1</sup> Improving efficiency in the Nation's health care system is an important component of the Department of Health and Human Services' (HHS) efforts to support a better health care system.

### Measures

Part of the discussion about how to improve efficiency involves the question about how best to measure it. Varying perspectives and definitions of health care efficiency exist, and the lack of consensus on what constitutes appropriate measurement of efficiency has stymied efforts to report on this area. To improve understanding of efficiency measures, AHRQ commissioned the RAND Corporation to systematically review measures of efficiency and to assess their potential to be tracked and reported at various levels.<sup>2</sup> The RAND report provides a typology of efficiency measures that emphasizes the multiple perspectives on efficiency. It also points out that measures must be considered from the standpoint of the measuring organization and its goal in assessing efficiency. In considering efficiency measures, AHRQ also built on another report that examined the question of efficiency from the cost-of-waste point of view. In that report, the authors outline another common typology for efficiency measurement: the tracking of overuse, underuse, and misuse in the health care system.<sup>3</sup>

For 2010, this chapter has been realigned around the National Priorities Partnership's (NPP) concept of overuse (one of the six national priorities). The vision is a health care system that "promotes better health and more affordable care by continually and safely reducing the burden of unscientific, inappropriate, and excessive care, including tests, drugs, procedures, visits, and hospital stays." The primary goal is to have "healthcare organizations that continually strive to improve the delivery of appropriate patient care, and substantially and measurably reduce extraneous services and treatments."

The measures this year are presented in the following layout.

- Inappropriate medication use
  - Adults age 65 and over who received potentially inappropriate prescription medications.
- Preventable emergency department visits and hospitalizations
  - Potentially avoidable hospitalization rates for adults.
  - Total national costs associated with potentially avoidable hospitalizations.
  - Medicare home health patients with potentially avoidable hospitalizations.
  - Nursing home residents with potentially avoidable hospitalizations.

# Efficiency

- Potentially harmful preventive services with no benefit
  - Males age 75 and over who had a prostate-specific antigen (PSA) test or a digital rectal exam (DRE) within the last 12 months.

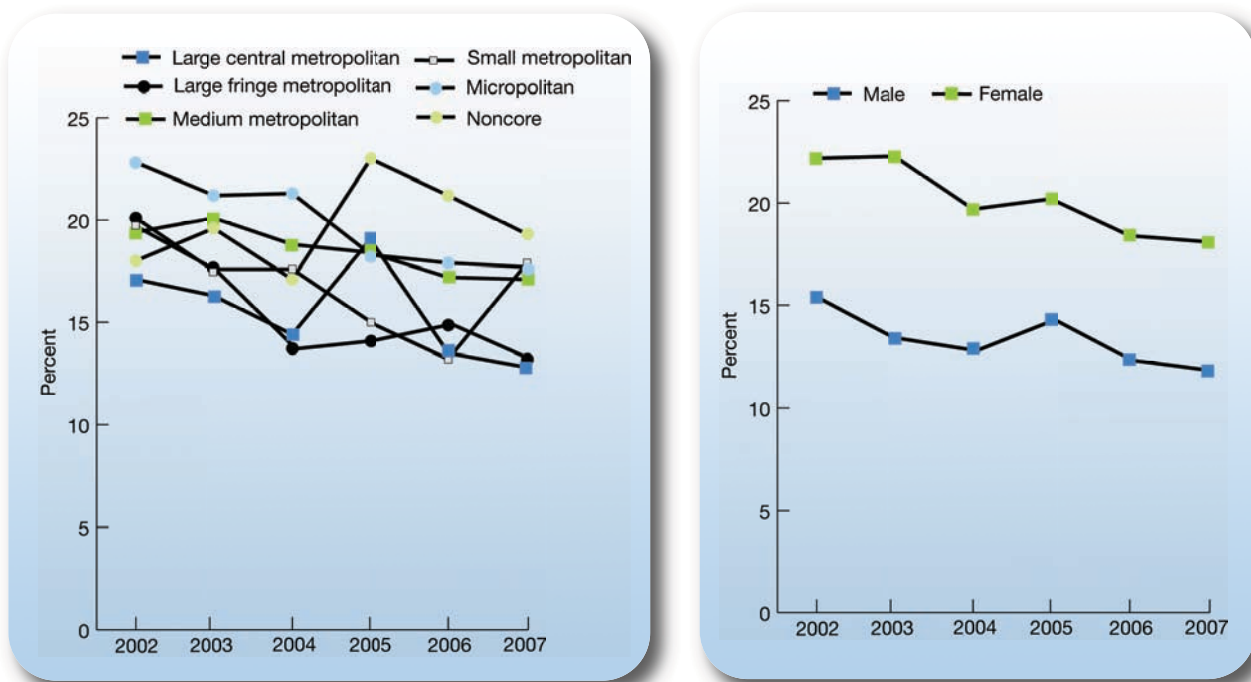
Consensus has yet to emerge about the appropriate framework and acceptable measures of efficiency, and the examples provided are designed to stimulate productive ongoing discussion about health care efficiency. We anticipate regularly reporting several measures in Efficiency chapters in future years. Notably, however, some of the measures that we are presenting in this year's chapter will appear only intermittently in the future.

## Findings

### Inappropriate Medication Use

Some drugs are potentially harmful for older patients but nevertheless are prescribed to them.<sup>4, i</sup>

**Figure 7.1. Adults age 65 and over who received potentially inappropriate prescription medications in the calendar year, by geographic area and gender, 2002-2007**



**Source:** Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2002-2007.

**Denominator:** Civilian noninstitutionalized population age 65 and over.

**Note:** Prescription medications received include all prescribed medications initially purchased or otherwise obtained, as well as any refills.

<sup>i</sup> Drugs that should always be avoided for older patients include barbiturates, flurazepam, meprobamate, chlorpropamide, meperidine, pentazocine, trimethobenzamide, belladonna alkaloids, dicyclomine, hyoscyamine, and propantheline. Drugs that should often or always be avoided for older patients include carisoprodol, chlorzoxazone, cyclobenzaprine, metaxalone, methocarbamol, amitriptyline, chlorthalidone, diazepam, doxepin, indomethacin, dipyridamol, ticlopidine, methyl dopa, reserpine, disopyramide, oxybutynin, chlorpheniramine, cyproheptadine, diphenhydramine, hydroxyzine, promethazine, and propoxyphene.

# Efficiency

- From 2002 to 2007, the percentage of older patients who received at least 1 of 33 potentially inappropriate drugs did not change significantly overall or for any geographic groups (Figure 7.1).
- In 2007, for those living in nonmetropolitan areas, the percentage of patients who received potentially inappropriate medications was significantly higher than for those living in metropolitan areas (18.2% compared with 14.7%; data not shown).
- In 2007, the percentage of female patients who received potentially inappropriate medications was significantly higher than for male patients (18.1% compared with 11.8%).

Also, in the NHDR:

- In 2007, the percentage of Asian patients who received potentially inappropriate medications was significantly lower than for Whites.

## Trends in Potentially Avoidable Hospitalizations and Costs

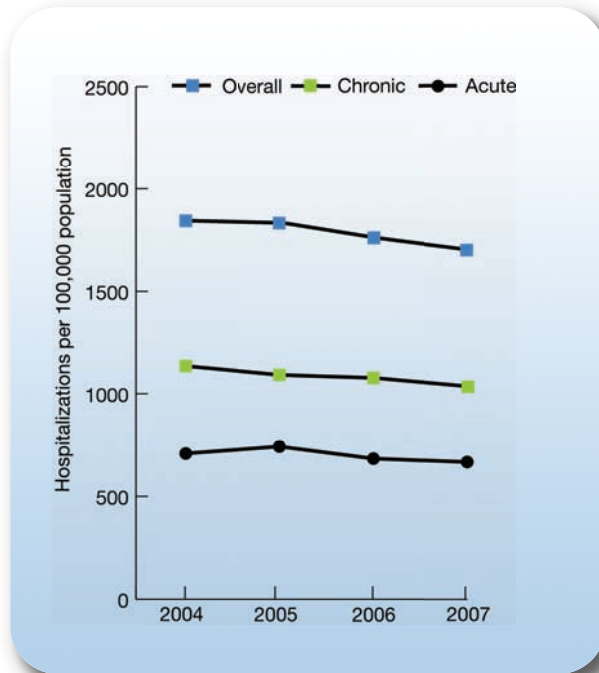
To address potentially avoidable hospitalizations and costs from the population perspective, data on ambulatory care-sensitive conditions are summarized here using the AHRQ Prevention Quality Indicators (PQIs). Not all hospitalizations that the AHRQ PQIs track are preventable. But ambulatory care-sensitive conditions are those for which good outpatient care can prevent the need for hospitalization or for which early intervention can prevent complications or more severe disease. The AHRQ PQIs track these conditions using hospital discharge data. Hospitalizations for acute conditions, such as dehydration or pneumonia, are distinguished from hospitalizations for chronic conditions, such as diabetes or congestive heart failure.

For this analysis, total hospital charges were converted to costs using Healthcare Cost and Utilization Project (HCUP) cost-to-charge ratios based on hospital accounting reports from the Centers for Medicare & Medicaid Services. Therefore, cost estimates in this section refer to hospital costs for providing care, but do not include either payers' costs or costs for physician care that are billed separately.



# Efficiency

**Figure 7.2. National trends in potentially avoidable hospitalization rates for adults, by type of hospitalization, 2004-2007**



**Source:** Agency for Healthcare Research and Quality, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2004-2007.

**Denominator:** Civilian noninstitutionalized adults age 18 and over.

**Note:** Annual rates are adjusted for age and gender

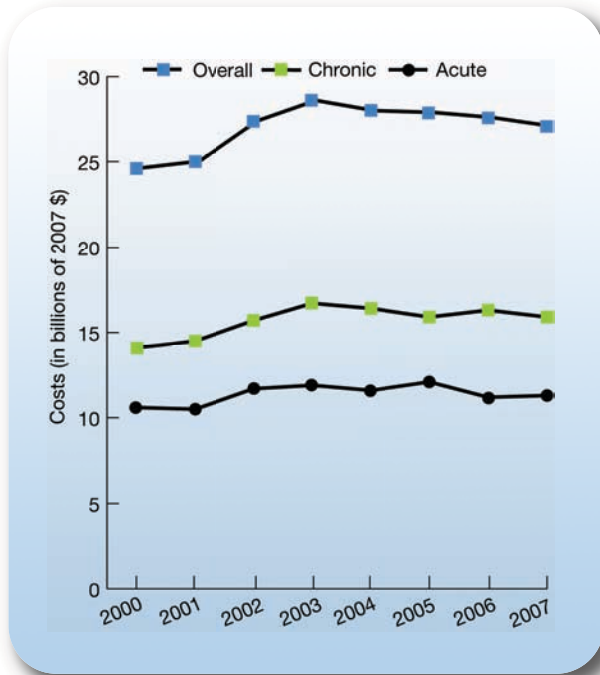
- From 2004 to 2007, overall rates of avoidable hospitalizations did not decrease significantly (Figure 7.2).
- Avoidable hospitalizations for acute conditions and chronic conditions did not change significantly from 2004 to 2007.
- In 2007, the top 4 State achievable benchmark for all potentially avoidable hospitalizations was 1,008 hospitalizations per 100,000.<sup>ii</sup> The overall achievable benchmark could be attained in 14 years.
- Also in 2007, the top 4 State achievable benchmark for acute potentially avoidable hospitalizations was 437 hospitalizations per 100,000.<sup>iii</sup> The acute achievable benchmark could be attained within 12 years.
- The top 4 State achievable benchmark for chronic potentially avoidable hospitalizations was 552 hospitalizations per 100,000.<sup>iv</sup> The chronic achievable benchmark could be attained in just under 16 years.

<sup>ii</sup> The top 4 States that contributed to the overall achievable benchmark are Hawaii, Oregon, Utah, and Washington.

<sup>iii</sup> The top 4 States that contributed to the acute achievable benchmark are Hawaii, Oregon, Utah, and Washington.

<sup>iv</sup> The top 4 States that contributed to the chronic achievable benchmark are Oregon, Utah, Vermont, and Washington.

Figure 7.3. Total national costs associated with potentially avoidable hospitalizations, 2000-2007



**Source:** Agency for Healthcare Research and Quality, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2000-2007.

**Denominator:** Civilian noninstitutionalized adults age 18 and over.

**Note:** Annual rates are adjusted for age and gender. Costs are adjusted for inflation and are represented in 2007 dollars.

- From 2000 to 2003, total national hospital costs associated with potentially avoidable hospitalizations<sup>v</sup> increased from \$24.6 billion to \$28.6 billion. Since then, costs have been gradually declining, to \$27.1 billion in 2007 (Figure 7.3).
- These changes are largely attributable to avoidable hospitalizations for chronic conditions, with national hospital costs that increased from \$14.1 billion to \$16.7 billion between 2000 and 2003 and then declined to \$15.9 billion in 2007.
- From 2000 to 2007, there were no statistically significant changes in national hospital costs for avoidable hospitalizations for acute conditions.

<sup>v</sup> Adjusted for inflation. The inflation adjustment was done using the gross domestic product implicit price deflator.



# Efficiency

## Potentially Avoidable Hospitalizations Among Medicare Home Health and Nursing Home Patients

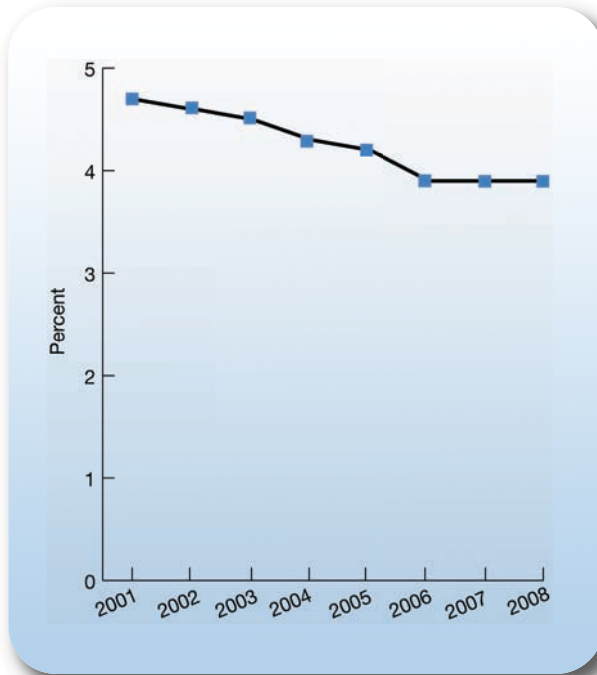
Many patients are hospitalized while receiving care from home health agencies and nursing homes, with resulting high costs and care transition problems. A number of these hospitalizations are appropriate. However, some hospital admissions could be prevented with better primary care and monitoring in these settings, or the patient could receive appropriate treatment in a less resource-intensive setting.

Using the AHRQ PQIs, we track potentially avoidable hospitalizations among Medicare patients occurring within 30 days of the start of home health or nursing home care. These patients may differ from patients discussed earlier in this chapter who are predominantly admitted for avoidable conditions from home. At home, some are receiving appropriate primary care and others have not visited a health care provider for years.

In contrast, Medicare home health and nursing home patients have regular contact with health providers, which should reduce rates of avoidable hospitalization. However, these patients are also more acutely ill, may become seriously ill when affected by a new illness, and may have multiple comorbidities. Medicare patients in these settings often have been hospitalized recently. Therefore, an avoidable hospitalization may represent a return to the hospital, perhaps against the expectation that the patient no longer needed acute care.

For application to home health and nursing home settings, the potentially avoidable stays are identified within a defined time period, 30 days, from the home health or nursing home admission date. If a patient is hospitalized more than once in that period, only the first stay is recognized for the measure. Data on home health patients come from Medicare fee-for-service (FFS) home health claims and Outcome and Assessment Information Set patient assessment information. Data on nursing home patients come from Medicare skilled nursing facility FFS claims and Minimum Data Set patient assessment information. These data are linked with Medicare Part A acute care hospital claims to determine hospitalizations for potentially avoidable conditions.

**Figure 7.4. Medicare home health patients with potentially avoidable hospitalizations within 30 days of start of care, 2001-2008**



**Source:** Centers for Medicare & Medicaid Services, Outcome and Assessment Information Set, 2001-2008, linked with Medicare Part A claims (100%).

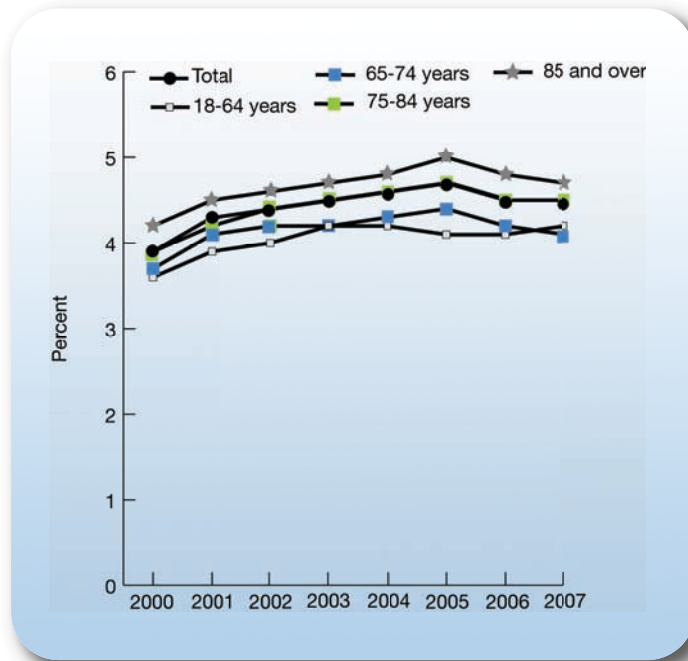
**Denominator:** Adult nonmaternity patients starting an episode of skilled home health care.

**Note:** Rates standardized to the 2006 patient population according to Medicare enrollment category.

- Between 2001 and 2008, hospitalizations within 30 days of home health episode start for potentially avoidable conditions declined from 4.7% to 3.8% (Figure 7.4).
- In 2001, the costs associated with hospitalizations for potentially avoidable conditions within 30 days of home health episode start were \$675.4 million; by 2008, the costs had risen to \$903.9 million.

# Efficiency

**Figure 7.5. Residents of skilled nursing facilities with potentially avoidable hospitalizations within 30 days of admission, by age, 2000-2007**



**Source:** Centers for Medicare & Medicaid Services, Minimum Data Set, 2000-2007, linked with Medicare Part A claims (100%).

**Denominator:** Residents who met the Medicare skilled nursing facility (SNF) criteria for nursing home admission.

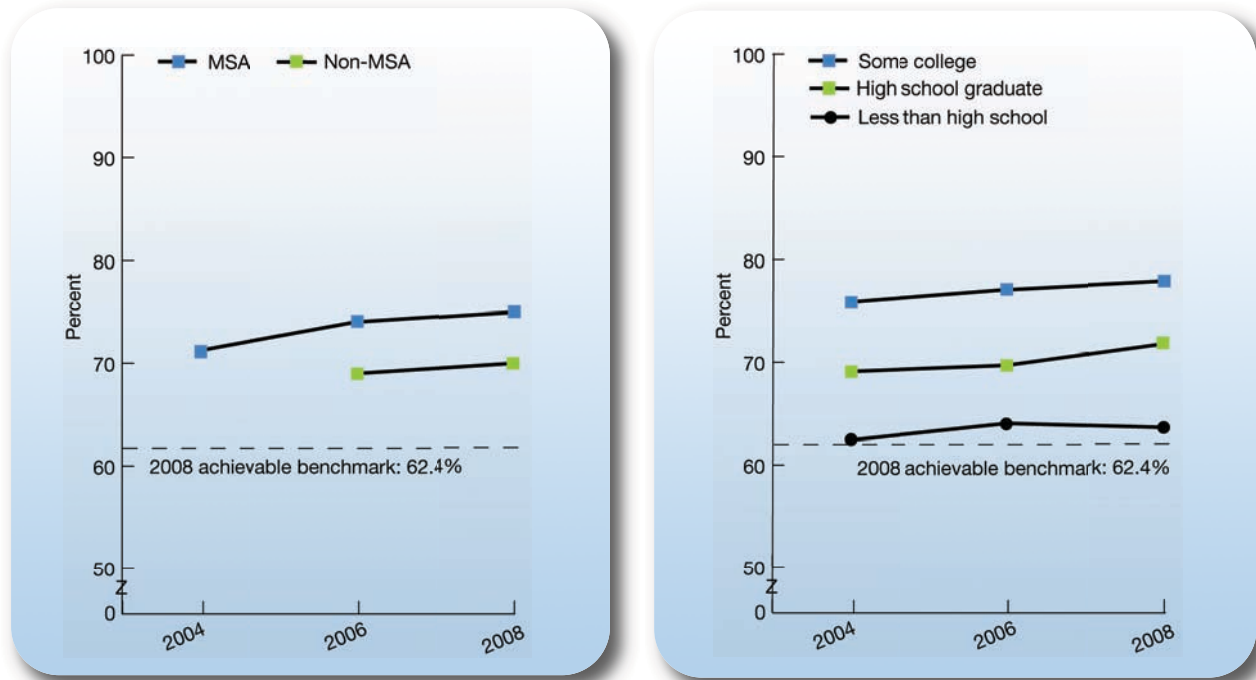
- Between 2000 and 2007, hospitalizations for potentially avoidable conditions within 30 days of skilled nursing home admission gradually increased overall and for all age groups observed (Figure 7.5).
- In 2000, the costs associated with hospitalizations for potentially avoidable conditions within 30 days of skilled nursing home episode start were \$343.7 million; by 2007, the costs had risen to \$724.4 million.

## Potentially Harmful Preventive Services

This section highlights waste and opportunities to reduce unnecessary costs. Waste includes overuse, underuse, and misuse of health care services. As it is one of the NPP priorities, the focus of this section is on overuse. Nevertheless, underuse and misuse are addressed in various sections of this report. Many of the effectiveness measures relate to people not getting services they need, i.e., underuse. Many of the safety measures relate to people getting services in a hazardous manner, i.e., misuse.

An example of overuse that can be reduced through education is PSA screening or a DRE to check for prostate cancer among men age 75 and over. The U.S. Preventive Services Task Force recommended against these tests in 2008<sup>v</sup> and there is continued concern that administration of the PSA test or DRE in men age 75 and over will lead to false positives and subsequent unnecessary treatments. Reductions in costs and improvements in quality should result from reductions in unnecessary PSA screening and DREs.

**Figure 7.6. Males age 75 and over who reported having a prostate-specific antigen test or a digital rectal exam within the last 12 months, by geographic location and education, 2004, 2006, and 2008**



**Key:** MSA = metropolitan statistical area.

**Source:** Centers for Disease Control and Prevention, Behavioral Risk Factor Surveillance System, 2004, 2006, and 2008.

**Denominator:** Adult males age 75 and over with no history of prostate cancer.

**Note:** Data for 2004, 2006, and part of 2008 precede the U.S. Preventive Services Task Force recommendation against screening men age 75 and over. It should be noted that PSA tests and DREs are provided to this population for purposes unrelated to prostate cancer screening. Data to determine the purpose of these services were unavailable and all reported PSA tests and DREs are reflected in the data shown.

- In 2008, the overall percentage of males age 75 and over who had a PSA test or a DRE within the last 12 months was 73.7% (data not shown).
- In 2008, the percentage of males age 75 and over who had a PSA test or a DRE within the last 12 months who had less than a high school education was lower than for males who had some college education (63.6% compared with 77.9%).
- In 2008, the top 5 State benchmark for males age 75 and over who had a PSA test or a DRE in the last 12 months was 62.4%.<sup>vi</sup> There was no clear evidence of movement toward achieving the benchmark for this measure.

Also, in the NHDR:

- The percentage of Black and Asian males age 75 and over who had a PSA test or a DRE within the last 12 months was lower than for White males.

<sup>vi</sup> The Top 5 States that contributed to this benchmark are California, Hawaii, Louisiana, New Jersey, and Tennessee.

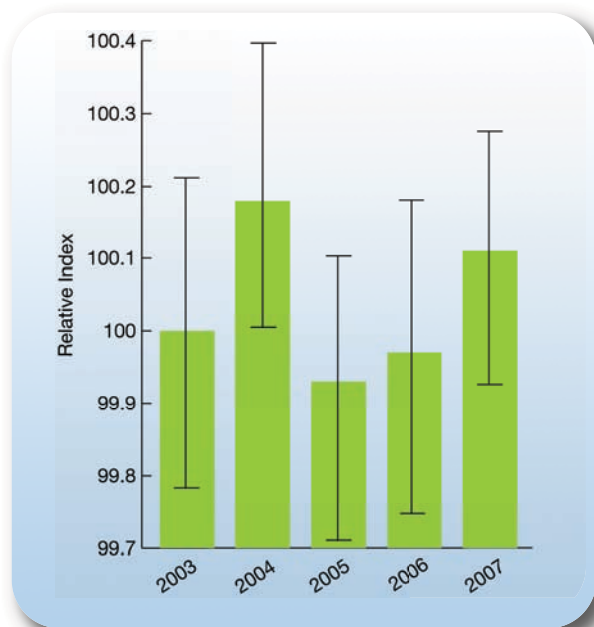
# Efficiency

## Trends in Hospital Efficiency

Significant attention has been paid to cost variations across providers and across the country. Yet it is often difficult to separate out costs that reflect differences among providers in outputs, patient burden of illness, or care quality. To address the provider perspective, hospital cost efficiency is examined using a technique from the field of econometrics that can account for such differences.<sup>vii</sup> This analysis uses data from the American Hospital Association Annual Survey and from Medicare Cost Reports, as well as data derived from the application of AHRQ Quality Indicators software to HCUP data and the application of HCUP's Comorbidity Software.<sup>viii</sup>

Here, hospital efficiency is defined as the ratio of best practice costs to total observed costs. For example, given the types and quantities of outputs a hospital produces, the input prices it pays, its case mix, its quality, and its market characteristics, a theoretical best practice hospital might incur expenses amounting to \$90 million. A comparison hospital in an identical situation with total expenses of \$100 million would have an estimated cost efficiency of 90%. Cost-efficiency estimates have been converted to index numbers with a base of 100 for the year 2003 as a way to place less emphasis on the specific magnitude of estimated efficiency than on its general trend.<sup>6</sup>

**Figure 7.7. Average estimated relative hospital cost-efficiency index for a selected sample of urban general community hospitals (includes confidence intervals), 2003-2007**



**Source:** Agency for Healthcare Research and Quality. Analysis based on 1,483 urban general community hospitals with data in the Healthcare Cost and Utilization Project, State Inpatient Databases.

**Note:** Error bars designate the upper and lower limits of the confidence interval.

<sup>vii</sup> Stochastic frontier analysis (SFA) is the technique used in this analysis. SFA can estimate best practice costs as the value total costs would be if full efficiency were attained. The hospital-level “cost efficiency” estimates SFA produces measure whether output is obtained using the fewest inputs (i.e., technical efficiency), as well as whether output is produced using the optimal mix of inputs, given prices (i.e., allocative efficiency), the size of a hospital’s operations (i.e., scale efficiency), and the range of a hospital’s operations (i.e., scope efficiency), including possible overspecialization or overdiversification.

<sup>viii</sup> Additional information on the HCUP Comorbidity Software may be found at <http://www.hcup-us.ahrq.gov/toolssoftware/comorbidity/comorbidity.jsp>.

- Estimated urban hospital cost efficiency increased slightly from 2003 to 2004. In the other years, estimated urban hospital cost efficiency was not statistically different than it was in 2003 (Figure 7.7).
- The most cost-efficient hospitals (i.e., hospitals in the highest quartile of estimated cost efficiency) compared favorably with the least cost-efficient hospitals (i.e., hospitals in the lowest quartile of estimated cost efficiency) on a number of important variables. The most cost-efficient hospitals had lower costs and fewer full-time-equivalent employees per case-mix-adjusted admission, compared with the least cost-efficient hospitals. The most cost-efficient hospitals also had a shorter average length of stay, although the difference was not statistically significant. The most cost-efficient hospitals had a higher operating margin<sup>ix</sup> than the least cost-efficient hospitals (Table 7.1).

**Table 7.1. Correlates of hospital cost efficiency**

Measure	Estimate	Standard deviation	Standard error mean
<b>Cost per case-mix-adjusted admission</b>			
Top quartile of hospital cost efficiency*	5,399.29	1,496.38	77.69
Bottom quartile of hospital cost efficiency	7,366.72	2,504.09	130.01
<b>Full-time equivalent employees per case-mix-adjusted admission</b>			
Top quartile of hospital cost efficiency	0.42	0.13	0.01
Bottom quartile of hospital cost efficiency	0.54	0.17	0.01
<b>Average length of stay (days)</b>			
Top quartile of hospital cost efficiency	5.20	1.96	0.10
Bottom quartile of hospital cost efficiency	5.30	2.38	0.12
<b>Operating margin</b>			
Top quartile of hospital cost efficiency	0.00	0.14	0.01
Bottom quartile of hospital cost efficiency	-0.08	0.26	0.01

**Source:** Agency for Healthcare Research and Quality. Analysis based on 2007 values for 1,483 urban general community hospitals.

**Note:** It is important to note that the figures reported above are not national estimates and no conclusions about national trends should be inferred. However, the hospitals in the analysis represent about 57% of all non-Federal urban general community hospitals and therefore provide an indication of the general trend that cost efficiency may be following.

<sup>ix</sup> Operating margin is a commonly used measure of profitability from operations or the excess of revenue over expenses. It is calculated by the following formula: Operating margin = (total net patient revenue - total operating expenses)/total net patient revenue.



# Efficiency

## References

1. Fisher ES, Wennberg DE, Stukel TA, et al. The implications of regional variations in Medicare spending. Part 1: the content, quality, and accessibility of care. *Ann Intern Med* 2003 Feb 18;138(4):273-87.
2. McGlynn E. Identifying, categorizing, and evaluating health care efficiency measures. Rockville, MD: Agency for Healthcare Research and Quality; 2008. AHRQ Pub. No. 08-0030. Available at: [www.ahrq.gov/qual/efficiency](http://www.ahrq.gov/qual/efficiency). Accessed December 8, 2009.
3. RTI International. Cost of poor quality or waste in integrated delivery system settings (Final report prepared for the Agency for Healthcare Research and Quality under Contract No. 290-00-0018-11); 2006. Available at: [www.ahrq.gov/RESEARCH/costpoorids.pdf](http://www.ahrq.gov/RESEARCH/costpoorids.pdf). Accessed August 13, 2009.
4. 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.
5. Screening for prostate cancer. Rockville, MD: Agency for Healthcare Research and Quality; 2008. Available at: <http://www.uspreventiveservicestaskforce.org/uspstf/uspSprca.htm>. Accessed August 13, 2009.
6. Mutter RL, Rosko MD, Wong HS. Measuring hospital inefficiency: the effects of controlling for quality and patient burden of illness. *Health Serv Res* 2008 Dec;43(6):1992-2013. Epub 2008 Sep 8.



## Chapter 8. Health System Infrastructure

Ensuring well-coordinated, high-quality health care requires the establishment of a supportive health system infrastructure. High-performance health systems require a well-distributed workforce, information systems for data collection, quality improvement analysis, and clinical communication support, as well as the organizational capacity to support culturally competent services and ongoing improvement efforts.<sup>1</sup>

Health care models such as Wagner’s Chronic Care Model (CCM) and Patient-Centered Medical Home (PCMH) promote a safety culture for patients. CCM promotes health care delivery systems designed to support community-based resources, self-management of care, and information support systems. Information support systems provide the basis for much of the continuity in patient records and clinician communication. PCMH uses a team-based model led by a primary care physician who provides continuous and coordinated care throughout the patient’s life. Features such as open scheduling, expanded hours, and new options for communication between patients and their personal physicians and practice staff enhance patient experiences and improve the quality of care.

A well-integrated, culturally competent health care delivery system that allows patient information to be readily available to providers positively affects the quality and efficiency of care and therefore patient outcomes. The adoption and use of health information technology (IT) can be an effective way to manage health care costs and improve the quality of care. Since the publication of the Institute of Medicine (IOM) report *Unequal Treatment: Confronting Racial and Ethnic Disparities in Healthcare*,<sup>i</sup> which emphasized the need for standardized collection and reporting of racial and ethnic data, the need for more granular detail on racial and ethnic subgroups has become apparent. This is an area where the adoption and use of health IT can be beneficial.

Another area of patient care that could be improved with the adoption and use of health IT is care coordination. A Commonwealth Fund study found that health IT can facilitate care coordination within a practice, but a lack of interoperability makes exchange of information between health care facilities difficult. Evidence has also shown that the adoption and effective use of health IT can help reduce medical errors and adverse events, enable better documentation and file organization, provide patients with information that assists their adherence to medication regimens and scheduled appointments, and assist doctors in tracking their treatment protocol.<sup>1</sup>

Having an adequate number of providers is an important aspect of the health system infrastructure and can be an indicator of quality of care. It is also important to have a large enough and appropriately distributed workforce to respond to expected increases in patient demand. Previous reports have presented data on diversity in the physician, nursing, and dental professions workforce. This year, the National Healthcare Quality Report (NHQR) and National Healthcare Disparities Report (NHDR) present data on the geographic and racial/ethnic distribution of the pharmacy workforce.

---

<sup>i</sup> Available at the National Academies Press Web site at <http://www.nap.edu/openbook.php?isbn=030908265X>.

# Health System Infrastructure

## Measures

The IOM acknowledges that health system infrastructure measures such as adoption and effective use of health IT are likely to be in the developmental stage, and evidence of the impact on quality improvement has not yet been strongly established. The IOM highlighted three infrastructure capabilities that should be further evaluated for reporting. These capabilities include care management processes, adoption and use of health IT, and workforce distribution and its relevance to minority and other underserved populations.

Previous reports have included information on the culture of patient safety in hospitals, and this information is updated here. Previous reports have also included information on the health care workforce and information about pharmacists is presented in this report. A new area where there is growing evidence of impact on health care quality is electronic prescribing (e-prescribing). Taking this into account, the 2010 reports include new e-prescribing measures for both hospital and ambulatory settings.

## Findings

### Care Management Processes: Focus on Patient Safety Culture

The 2010 NHQR and NHDR highlight the organizational capacity—resources, knowledge, and processes—of hospitals in the area of patient safety. High-reliability organizations that achieve low rates of adverse events establish “cultures of safety.” A culture of safety is characterized by shared dedication to making work safe, blame-free reporting and communication about error, collaboration and teamwork across disciplines, and adequate resources to prevent adverse events.

AHRQ developed the Hospital Survey on Patient Safety Culture to help hospitals assess the culture of safety in their facilities. AHRQ began producing comparative database reports in 2007 to help hospitals assess their performance relative to similar institutions.

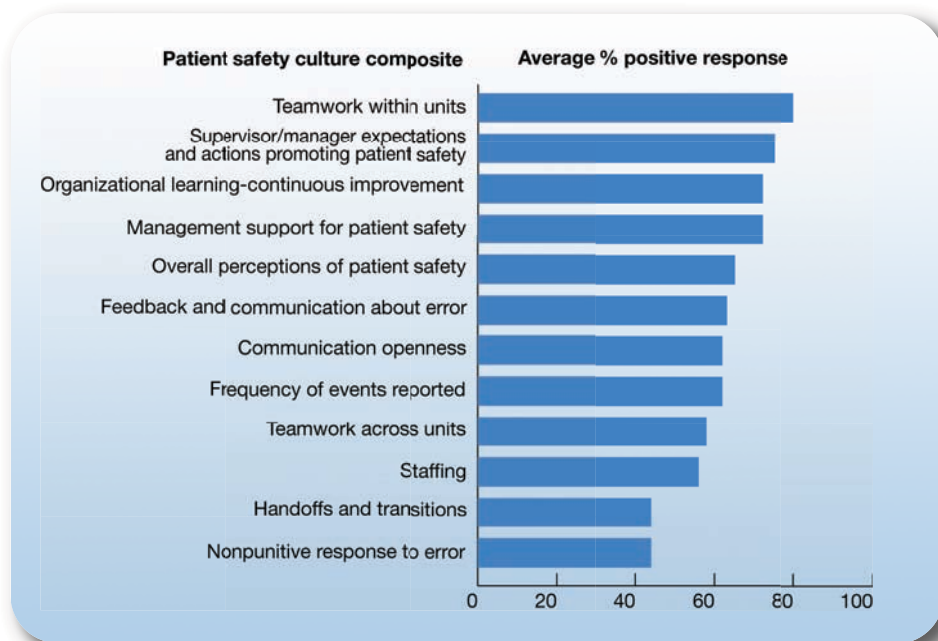
In this NHQR, we present data from the *Hospital Survey on Patient Safety Culture: 2010 Comparative Database Report*.<sup>2</sup> This report is based on survey responses collected in 2009 from more than 330,000 hospital staff in 885 hospitals representing 15% of the Nation’s hospitals. The average hospital response rate was 56%, with an average of 383 completed surveys per hospital.

Most hospitals administered Web surveys, which resulted in lower response rates (50%) compared with response rates from paper (63%) or mixed-mode surveys (56%). In addition, most hospitals administered the survey to all staff or a sample of all staff from all hospital departments. Nurses accounted for more than one-third of respondents, followed by “other.” More than three-quarters of respondents had direct interaction with patients.

Results are presented for the 12 patient safety culture composites addressed in the survey, expressed as average percent positive response. Percent positive refers to the percentage of responses that agree or strongly agree with a positively worded item (e.g., “People support one another in this work area”) and the percentage that disagree or disagree strongly with a negatively worded item (e.g., “We have safety problems in this work area”). Hospitals contributing data to the comparative database mirror the population of U.S. hospitals as a whole, but participation is entirely voluntary. Thus, it may not be possible to generalize findings to all types of facilities.

# Health System Infrastructure

Figure 8.1. Patient safety culture composites for all hospitals, 2009



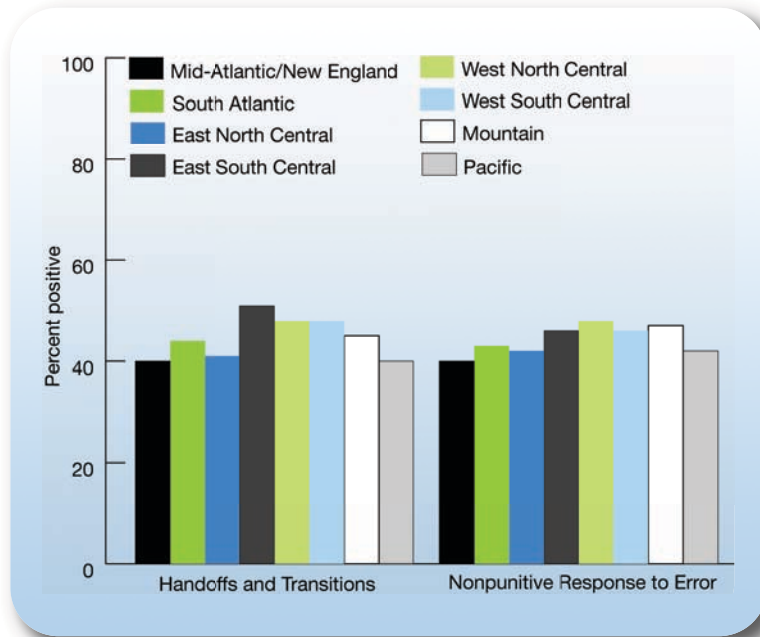
Source: Agency for Healthcare Research and Quality, Hospital Survey on Patient Safety Culture: 2010 Comparative Database Report.

- One strength for most hospitals was Teamwork Within Units, the extent to which staff support each other, treat each other with respect, and work together. Another strong area for hospitals overall was Supervisor/Manager Expectations and Actions Promoting Patient Safety (Figure 8.1). This composite refers to the extent to which supervisors/managers consider staff suggestions for improving patient safety, praise staff for following patient safety procedures, and do not overlook patient safety problems.
- Hospitals in the East South Central and West South Central regions had higher percentages of positive response for Teamwork Within Units (81%) and Supervisor Expectations and Actions Promoting Patient Safety (78%) than hospitals in other regions (data not shown).

Handoffs and Transitions as well as Nonpunitive Response to Error are highlighted due to the consistently low percentage of positive response given by hospital staff. These two areas had the lowest percent positive response across all geographic regions.

# Health System Infrastructure

Figure 8.2. Patient safety culture composites, by region, 2009



**Source:** Agency for Healthcare Research and Quality, Hospital Survey on Patient Safety Culture: 2010 Comparative Database Report.  
**Note:** States are categorized into census divisions except New England and Mid-Atlantic regions, which are merged.

- Overall, many hospitals performed poorly on Nonpunitive Response to Error, the extent to which staff feel that their mistakes and event reports are not held against them and that mistakes are not kept in their personnel file. The Mid-Atlantic/New England (40%), Pacific (42%), and East North Central (42%) regions had the lowest percentages of positive response for Nonpunitive Response to Error (Figure 8.2).
- Similar results were seen for Handoffs and Transitions, the extent to which important patient care information is transferred across hospital units and during shift changes.
- The East South Central hospitals had higher average percent positive scores while the Mid-Atlantic/New England region had lower average percent positive scores across composites.

Also, in the NHDR:

- Government hospitals had higher percentages of positive response for Handoffs and Transitions (47%) compared with nongovernment hospitals (44%). For Nonpunitive Response to Error, both government and nongovernment hospitals had 44% positive response.



# Health System Infrastructure

## Health Information Technology: Focus on Medication Management

E-prescribing uses technology to allow prescribers to electronically transmit prescriptions. The IOM report *Future Directions for the National Healthcare Quality and Disparities Reports* highlights the adoption and use of health IT as a tool to manage cost and improve the quality of care delivered. Medication errors occur during the prescribing, dispensing, administering, and monitoring phases of patient care. Adoption and use of e-prescribing can be a major step in reducing medical errors by improving the prescribing and dispensing aspects of medication management.<sup>3</sup>

Studies show that the elimination of handwriting interpretation decreases medication error rates and reduces communication time between pharmacies and office staff. It also can avoid costs resulting from adverse drug events.<sup>4</sup> It is estimated that between 380,000 and 450,000 adverse drug events occur annually in hospital settings, resulting in a cost of \$3.5 billion annually in the United States.<sup>5</sup>

One aspect of e-prescribing, clinical decision support, encompasses a wide range of computerized tools directed at improving patient care, including computerized reminders and advice regarding drug selection, dosage, interactions, allergies, and the need for subsequent orders.<sup>6</sup> In addition, once an e-prescription is in the system, it will follow the patient, avoiding many of the “handoff errors.”

## Office-Based Physicians With Electronic Prescribing Systems

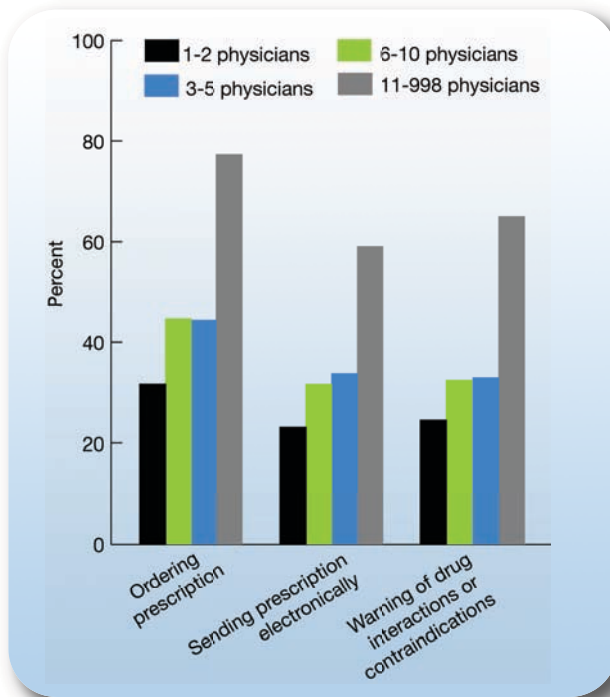
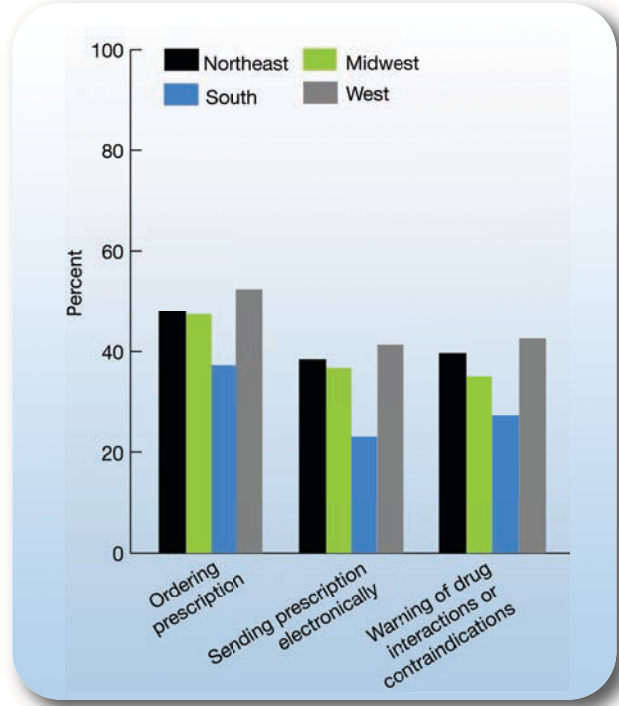
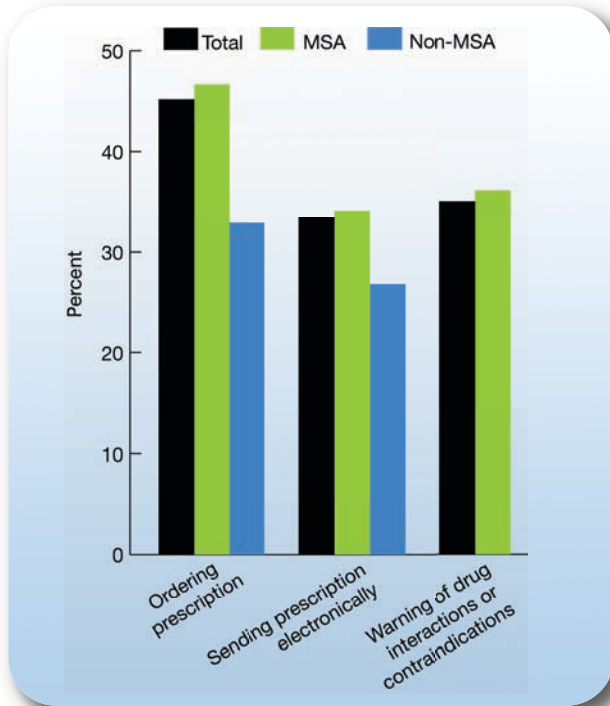
E-prescribing provides physicians with a tool to improve medication management. Using an e-prescribing system, physicians can readily check for contraindications, drug allergies and harmful interactions, treatment duplication, body weight, patient age, and medication appropriateness before prescribing a new medication.





# Health System Infrastructure

Figure 8.3. Office-based physicians with electronic prescribing systems, by metropolitan status, region, and practice size, 2009 (preliminary)



**Key:** MSA = metropolitan statistical area.  
**Source:** Centers for Disease Control and Prevention, National Center for Health Statistics, National Ambulatory Medical Care Survey, Electronic Medical Record Mail Survey Supplement, preliminary, 2009.  
**Note:** For Warning of Drug Interactions or Contraindications, data for non-MSAs did not meet standards of reliability or precision.

# Health System Infrastructure

## Adopting Computerized Systems

- Preliminary estimates from 2009 indicate that office-based physicians are more likely to have computerized systems for ordering prescriptions, sending prescriptions electronically, and warning of drug interactions or contraindications if they are part of practices with 11 or more physicians or if they practice in the West (Figure 8.3).

## Ordering Prescriptions

- Preliminary estimates from 2009 indicate that the percentage of office-based physicians practicing in metropolitan areas who had a computerized system for ordering prescriptions was significantly higher than that of physicians in nonmetropolitan areas.
- Physicians in the West had a significantly higher percentage of computerized systems for ordering prescriptions than physicians in the South.
- Practices with 11 or more physicians had a significantly higher percentage of computerized systems for ordering prescriptions than practices with 10 or fewer physicians.

## Sending Prescriptions Electronically

- Preliminary estimates from 2009 indicate that physicians in the West had a significantly higher percentage of computerized systems for sending prescriptions electronically than physicians in the South.
- Practices with 11 or more physicians had a significantly higher percentage of computerized systems for sending prescriptions electronically than practices with 10 or fewer physicians.

## Providing Drug Warnings

- Preliminary estimates from 2009 indicate that physicians in the West had a significantly higher percentage of computerized systems for warning of drug interactions or contraindications than physicians in the South.
- Practices with 11 or more physicians had a significantly higher percentage of computerized systems for warning of drug interactions or contraindications than practices with 10 or fewer physicians.

Also, in the NHDR:

- Preliminary estimates from 2009 indicate that the percentage of office-based physicians ages 35–44 who had a computerized system for warning of drug interactions or contraindications was significantly higher than the percentage of physicians age 55 and over.
- The percentage of physicians in areas with populations of less than 50% non-Hispanic Whites that had a computerized system for warning of drug interactions or contraindications was similar to physicians in areas with populations of 50% or more non-Hispanic Whites.

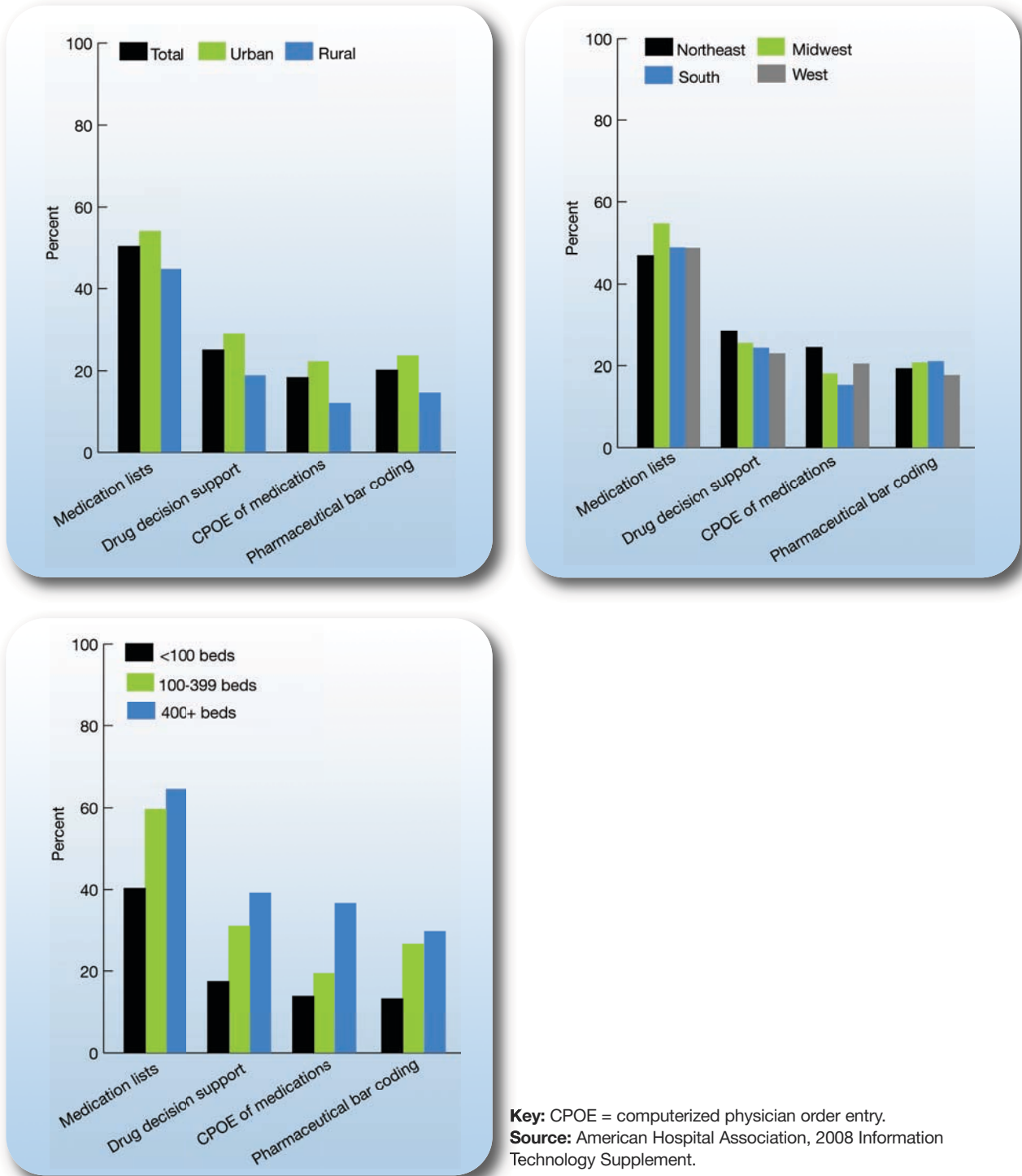
## Medication Management in Hospitals

Patient handoffs and transitions of care have been identified as placing patients at increased risk of adverse events. Once a patient is admitted to the hospital, medication plays a vital role in his or her recovery. Doses of patients' medications may be altered, new drugs added, and others discontinued. Electronic medication

# Health System Infrastructure

management can aid in the reduction of adverse events by providing accurate, current medication information as patient care is transferred from one health care team to another.

**Figure 8.4. Electronic management of medication in hospitals, by metropolitan status, geographic region, and hospital size, 2008**



**Key:** CPOE = computerized physician order entry.  
**Source:** American Hospital Association, 2008 Information Technology Supplement.

# Health System Infrastructure

## Overall Computerized System Adoption

- In 2008, hospitals that had the highest percentage of adoption of a fully implemented computerized system for electronic medication lists, drug decision support, computerized physician order entry (CPOE), and pharmaceutical bar coding were hospitals with 400 or more beds, located in urban areas (data not shown).

## Medication Lists

- In 2008, 50.5% of hospitals had an electronic system that supports medication lists (Figure 8.4).
- Fifty-four percent of urban hospitals and 45% of rural hospitals had an electronic system that supports medication lists. Hospitals in the Midwest had the highest percentage of electronic systems that support medication lists (54.8%). In the West and South, 49%, and in the Northeast, 47% of hospitals had an electronic system that supports medication lists.
- Hospitals with 400 or more beds had a higher percentage of electronic systems that support medication lists (64.6%) compared with hospitals with 100-399 beds (59.7%) and hospitals with fewer than 100 beds (40.4%).

## Drug Decision Support

- In 2008, 25.1% of hospitals had a fully implemented electronic system for drug decision support.
- The largest difference in implementation was observed between large and small hospitals. Nearly 40% of hospitals with 400 or more beds had a fully implemented electronic system for drug decision support but only 17.5% of hospitals with fewer than 100 beds had a fully implemented system.
- The Northeast had the highest percentage, 28.6%, of hospitals with a fully implemented electronic system for drug decision support. In the Midwest, 25.6% of hospitals had a fully implemented electronic system for drug decision support. In the South, 24.4%, and in the West, 23% of hospitals had a fully implemented electronic system for drug decision support.

## CPOE of Medications

- In 2008, 18.4% of hospitals had fully implemented CPOE systems.
- Urban areas had almost double the percentage of hospitals with a fully implemented CPOE system (22.3%) compared with rural areas (12.2%).
- The Northeast had the highest percentage, 24.4%, of hospitals with a fully implemented CPOE system. The West had 20.5%, the Midwest had 18.2%, and the South had 15.4% of hospitals with a fully implemented CPOE system.
- There was a large discrepancy in implementation between small and large hospitals. Only 13.9% of hospitals with fewer than 100 beds had a fully implemented CPOE system while 36.7% of hospitals with 400 or more beds had a fully implemented CPOE system.

## Pharmaceutical Bar Coding

- In 2008, 20.2% of hospitals had fully implemented pharmaceutical bar coding systems.
- Approximately 24% of urban hospitals and 15% of rural hospitals had fully implemented pharmaceutical bar coding systems.

# Health System Infrastructure

- In the South, 21.1% of hospitals had fully implemented pharmaceutical bar coding systems; in the Midwest, 20.8%; in the Northeast, 19.3%; and in the West, 17.8%.
- The largest difference in implementation was observed between large and small hospitals. While 29.8% of hospitals with 400 or more beds had a fully implemented pharmaceutical bar coding system, only 13.3% of hospitals with fewer than 100 beds had a fully implemented system.

Also, in the NHDR:

- Hospitals that were members of the Council of Teaching Hospitals (COTH) had a much higher percentage of electronic systems that support medication lists than hospitals that were not members of COTH (72.6% compared with 48.8%).
- Hospitals run by the Federal Government also had a much higher percentage (84.4%) of electronic systems that support medication lists than non-Federal (43.8%), not-for-profit (56.5%), and investor-owned hospitals (34.8%).
- Nearly 70% of children's general hospitals and 53.9% of general medical and surgical hospitals had an electronic system that supports medication lists. Between 24% and 36% of psychiatric, rehabilitation, and acute long-term care hospitals had an electronic system that supports medication lists.

## Workforce Distribution

Pharmacists distribute prescription drugs to individuals. They also advise their patients, physicians, and other health practitioners on the selection, dosages, interactions, and side effects of medications. In addition, they monitor the health and progress of patients to ensure that they are using their medications safely and effectively. Most pharmacists work in a community setting, such as a retail drugstore, or in a health care facility, such as a hospital.

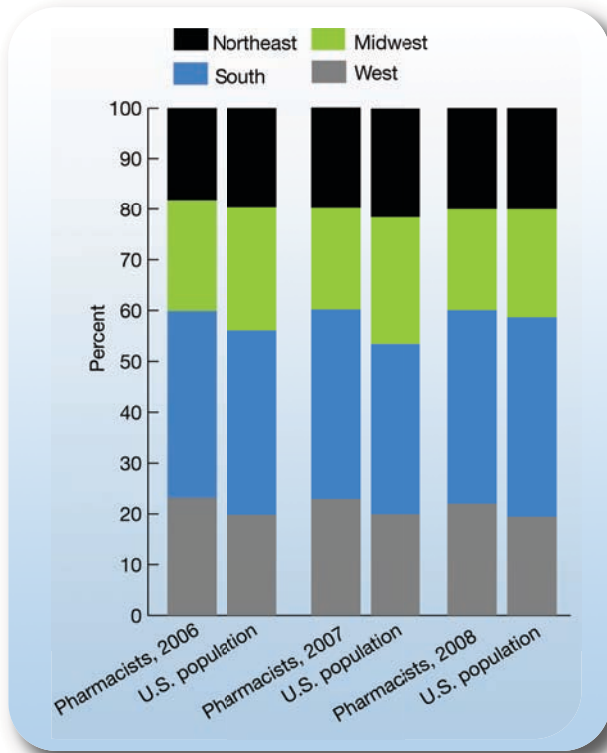
Pharmacists are an important part of the health care infrastructure, and as treatment protocols become more complicated, the role that pharmacists have in providing quality care increases. Pharmacists are engaged in efforts to improve the quality of the drug use process and to identify ways to reduce medication errors.<sup>7</sup> Studies have shown that pharmacist involvement in patient care can result in better diabetes and hypertension management as well as a decrease in heart failure events and mortality.<sup>8</sup> Also, pharmacist involvement in patient care can reduce adverse drug reactions or medication errors and increase patient comprehension of treatment protocols and medication adherence.

In 2008, more than 12% of the United States population was over the age of 65 and this number is expected to grow. This changing demographic is expected to increase the demand for pharmacists. In addition, the advent of new drugs for the treatment of more conditions and the growth in the number of people with chronic conditions will increase the demand for pharmacists.

This year, the NHQR presents the geographic distribution of pharmacists to examine access to this vital health care service in various areas.

# Health System Infrastructure

**Figure 8.5. U.S. pharmacy professionals compared with the U.S. population, by geographic region, 2006-2008**



Source: U.S. Census, American Community Survey, 2006-2008

- In 2008, 37.8% of the approximately 301,000 pharmacists in the United States practiced in the South; 23.7% in the Midwest, 20.2% in the West, and 18.3% in the Northeast (Figure 8.5). The pharmacist workforce was representative of the U.S. population in each region. No region had a disproportionate percentage of pharmacists. This follows a similar pattern observed in 2006 and 2007.

Also, in the NHDR:

- In 2008, 74.3% of the approximately 301,000 pharmacists in the United States were White; 6.2% were Black, 14.4% were Asian, and 3.7% were Hispanic. Compared with the general U.S. population, Whites and Asians were overrepresented and Blacks and Hispanics were underrepresented.



# Health System Infrastructure

## References

1. Institute of Medicine, Board of Health Care Services. Future directions for the National Healthcare Quality and Disparities Reports. Washington, DC: National Academies Press; 2010.
2. Sorrra J, Famolaro T, Dyer N, et al. Hospital Survey on Patient Safety Culture: 2010 comparative database report (Prepared by Westat under Contract No. 290-2007-10024C). Rockville, MD: Agency for Healthcare Research and Quality; 2010. AHRQ Publication No. 10-0026. Available at: <http://www.ahrq.gov/qual/hospsurvey10/>. Accessed June 15, 2010.
3. Institute of Medicine, Board on Health Care Services. Informing the future: critical issues in health. 3rd ed. Washington, DC: National Academies Press; 2007.
4. Balfour DC 3rd, Evans S, Januska J, et al. Health information technology—results from a roundtable discussion. *J Manag Care Pharm* 2009 Jan-Feb;15(1 Suppl A):10-17.
5. Institute of Medicine, Board on Health Care Services. Preventing medication errors. Quality Chasm Series. Washington, DC: National Academies Press; 2006.
6. Kaushal R, Shojania KG, Bates DW. Effects of computerized physician order entry and clinical decision support systems on medication safety: a systematic review. *Arch Intern Med* 2003 Jun 23;163(12):1409-16.
7. The pharmacist workforce: a study of the supply and demand for pharmacists. Rockville, MD: Health Resources and Services Administration; 2000. Available at: <ftp://ftp.hrsa.gov/bhpr/nationalcenter/pharmacy/pharmstudy.pdf>. Accessed November 1, 2010.
8. Altavela JJ, MK, Ritter M. A prospective trial of a clinical pharmacy intervention in a primary care practice in a capitated payment system. *J Manag Care Pharm* 2008;14(9):831-43.



## Chapter 9. Access to Health Care

Many Americans have good access to health care that enables them to benefit fully from the Nation's health care system. Others face barriers that make it difficult to obtain basic health care services. As shown by extensive research and confirmed in previous National Healthcare Disparities Reports (NHDRs), racial and ethnic minorities and people of low socioeconomic status (SES)<sup>i</sup> are disproportionately represented among those with access problems.

Previous findings from the National Healthcare Quality Report (NHQR) and NHDR showed that health insurance was the most significant contributing factor to poor quality of care for some of the core measures and many are not improving. Uninsured people were less likely to get recommended care for disease prevention, such as cancer screening, dental care, counseling about diet and exercise, and flu vaccination. They also were less likely to get recommended care for disease management, such as diabetes care management.

Poor access to health care comes at both a personal and societal cost. For example, if people do not receive vaccinations, they may become ill and spread disease to others. This increases the burden of disease for society overall in addition to the burden borne individually.

### Components of Health Care Access

Access to health care means having “the timely use of personal health services to achieve the best health outcomes.”<sup>1</sup> Attaining good access to care requires three discrete steps:

- Gaining entry into the health care system.
- Getting access to sites of care where patients can receive needed services.
- Finding providers who meet the needs of individual patients and with whom patients can develop a relationship based on mutual communication and trust.<sup>2</sup>

Health care access is measured in several ways, including:

- Structural measures of the presence or absence of specific resources that facilitate health care, such as having health insurance or a usual source of care.
- Assessments by patients of how easily they are able to gain access to health care.
- Utilization measures of the ultimate outcome of good access to care (i.e., the successful receipt of needed services).

### Facilitators and Barriers to Health Care

Facilitators and barriers to health care discussed in this section include health insurance, usual source of care (including having a usual source of ongoing care and a usual primary care provider), and patient perceptions of need.

---

<sup>i</sup> As described in Chapter 1, Introduction and Methods, income and educational attainment are used to measure SES in the NHDR. Unless specified, poor = below the Federal poverty level (FPL), near poor = 100-199% of the FPL, middle income = 200-399% of the FPL, and high income = 400% or more of the FPL. The measure specifications and data source descriptions provide more information on income groups by data source.

# Access to Health Care

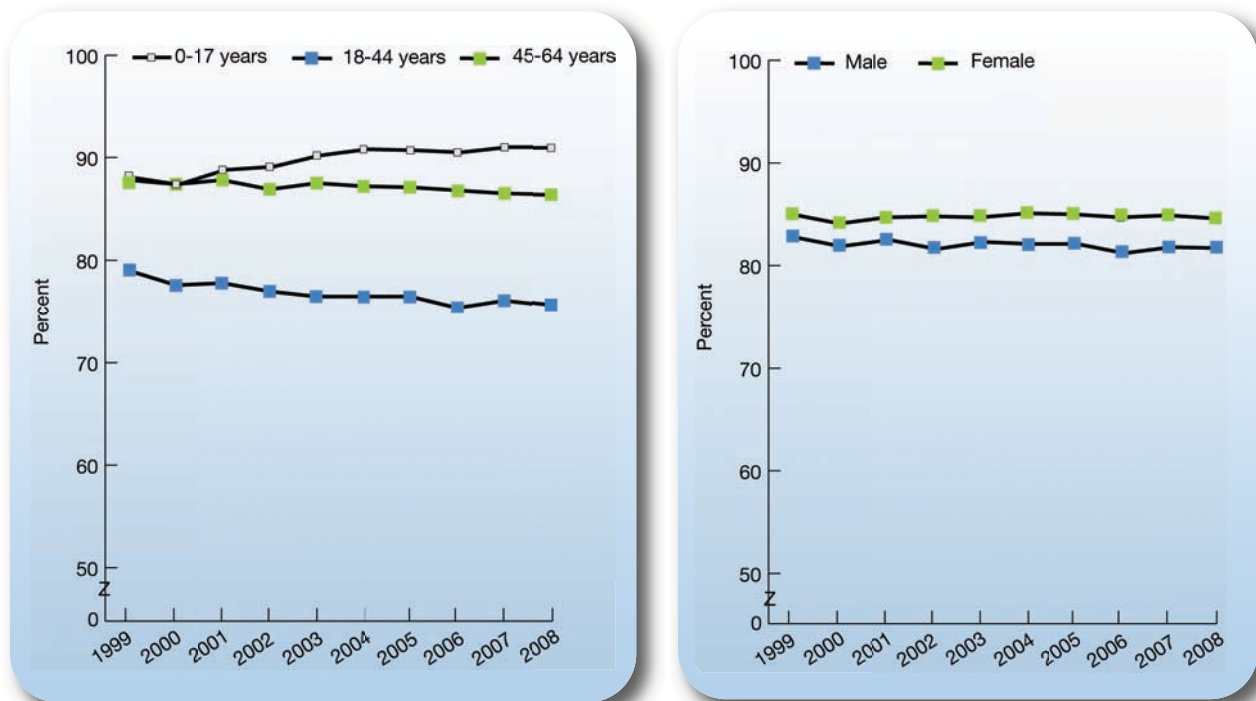
## Findings

### Health Insurance

Health insurance facilitates entry into the health care system. Uninsured people are less likely to receive medical care<sup>3</sup> and more likely to have poor health status.<sup>4</sup> The costs of poor health among uninsured people total \$65 billion to \$130 billion annually.<sup>5</sup>

The financial burden of uninsurance is also high for uninsured individuals; almost 50% of personal bankruptcy filings are due to medical expenses.<sup>6</sup> Uninsured individuals report more problems getting care, are diagnosed at later disease stages, and get less therapeutic care.<sup>6,7</sup> They are sicker when hospitalized and more likely to die during their stay.<sup>7</sup>

**Figure 9.1. People under age 65 with health insurance, by age and gender, 1999-2008**



**Source:** Centers for Disease Control and Prevention, National Center for Health Statistics, National Health Interview Survey (NHIS), 1999-2008.

**Denominator:** Civilian noninstitutionalized population under age 65.

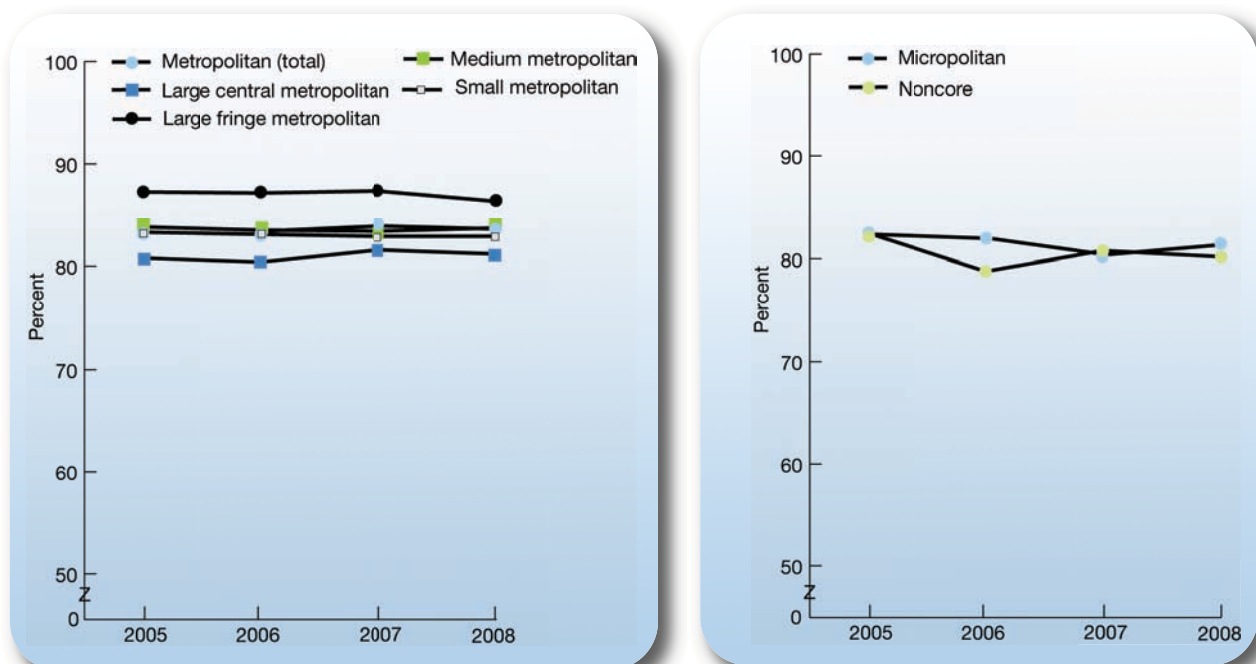
**Note:** NHIS respondents are asked about health insurance coverage at the time of interview. Respondents are considered uninsured if they lack private health insurance, Medicare, Medicaid, State Children's Health Insurance Program, a State-sponsored health plan, other government-sponsored health plan, or a military health plan, or if their only coverage is through the Indian Health Service.

- Overall, there was no statistically significant change from 1999 to 2008. In 2008, 83.2% of people under age 65 had health insurance (data not shown).

# Access to Health Care

- From 1999 to 2008, the percentage of children ages 0-17 who had health insurance improved (from 88.1% to 91.0%; Figure 9.1). However, for adults ages 18-44 and 45-64, the percentage worsened (for ages 18-44, from 79.0% to 75.6%; and for ages 45-64, from 87.8% to 86.4%).
- In 2008, adults ages 18-44 and 45-64 were less likely than children ages 0-17 to have health insurance (75.6% and 86.4% respectively, compared with 91.0%).
- From 1999 to 2008, the percentage of males who had health insurance decreased (from 82.8% to 81.7%). There was no statistically significant change for females during this period.
- Females were more likely to have health insurance than males throughout this period.

**Figure 9.2. People under age 65 with health insurance, by residence location, 2005-2008**



**Source:** Centers for Disease Control and Prevention, National Center for Health Statistics, National Health Interview Survey (NHIS), 1999-2008.

**Denominator:** Civilian noninstitutionalized population under age 65.

**Note:** NHIS respondents are asked about health insurance coverage at the time of interview. Respondents are considered uninsured if they lack private health insurance, Medicare, Medicaid, State Children's Health Insurance Program, a State-sponsored health plan, other government-sponsored health plan, or a military health plan, or if their only coverage is through the Indian Health Service. This measure reflects the percentage of survey respondents under age 65 who were covered by health insurance at the time of the interview.

- From 2005 to 2008, there were no statistically significant changes by residence location (Figure 9.2).
- In 2008, residents of large fringe metropolitan areas and medium metropolitan areas were more likely than residents of large central metropolitan areas to have health insurance (86.4% and 83.7%, respectively, compared with 81.2%). There were no statistically significant differences in nonmetropolitan areas between micropolitan areas and noncore<sup>ii</sup> areas.

<sup>ii</sup> Noncore areas are outside of metropolitan or micropolitan statistical areas. Micropolitan and noncore areas are typically regarded as "rural."

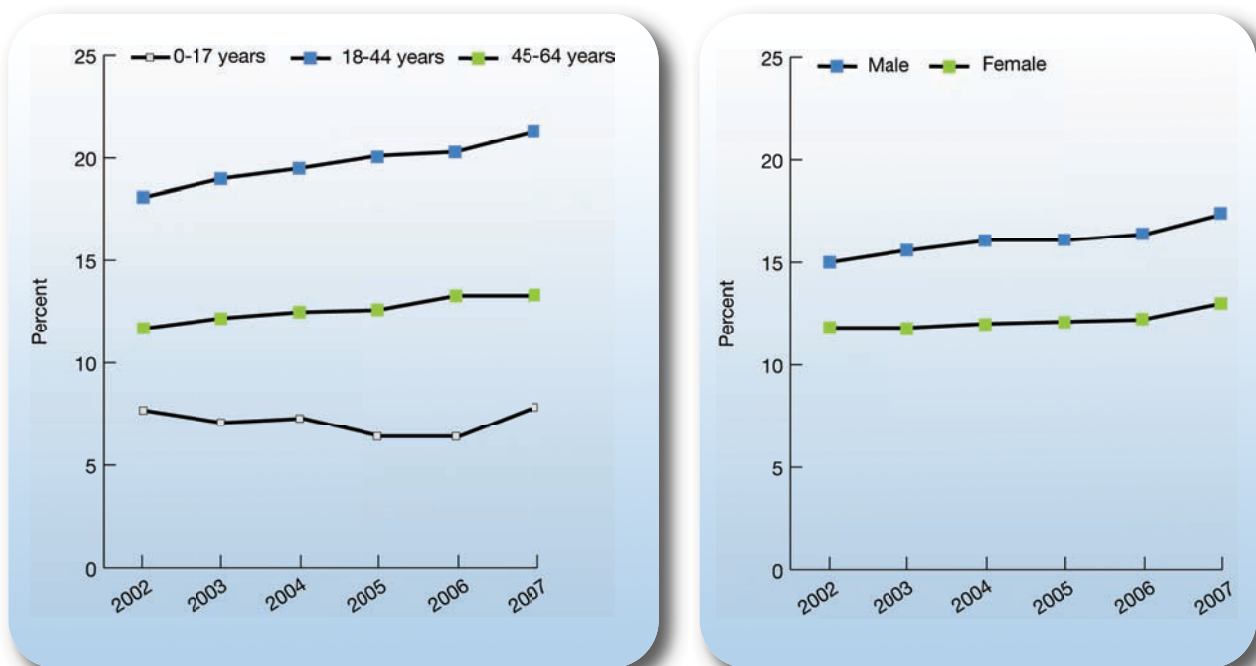
# Access to Health Care

Also, in the NHDR:

- From 2005 to 2008, the percentage of people with health insurance improved for poor people, but they were still less likely to have health insurance than high-income people. Middle-income people were also less likely than high-income people to have health insurance and the percentage worsened from 2005 to 2008.
- Asians were more likely than Whites to have health insurance. American Indians and Alaska Natives were less likely than Whites to have health insurance, and Hispanics were less likely than non-Hispanic Whites to have health insurance.
- In California, there were also differences among Hispanic and Asian subgroups. Koreans and Vietnamese people were less likely than non-Hispanic Whites to have health insurance. Central Americans and Mexicans were less likely to have health insurance than non-Hispanic Whites.
- In California, people under age 65 who did not speak English well or very well and people who did not speak English at all were less likely than native English speakers to have health insurance. Also, people under age 65 who were not born in the United States were less likely to have health insurance than those who were born in the United States.

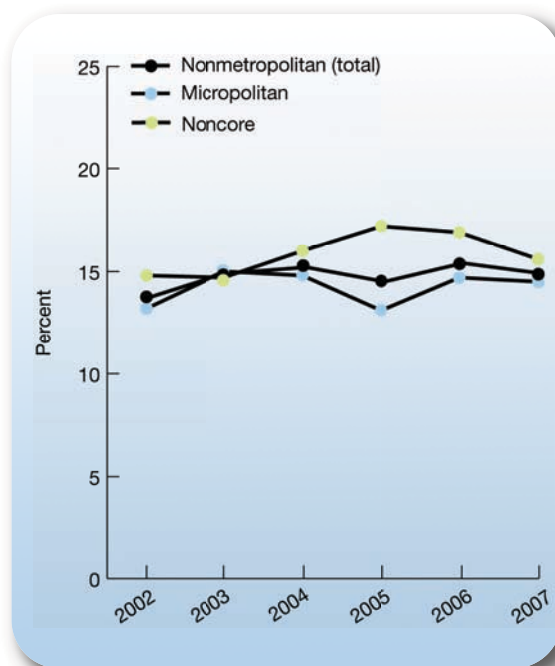
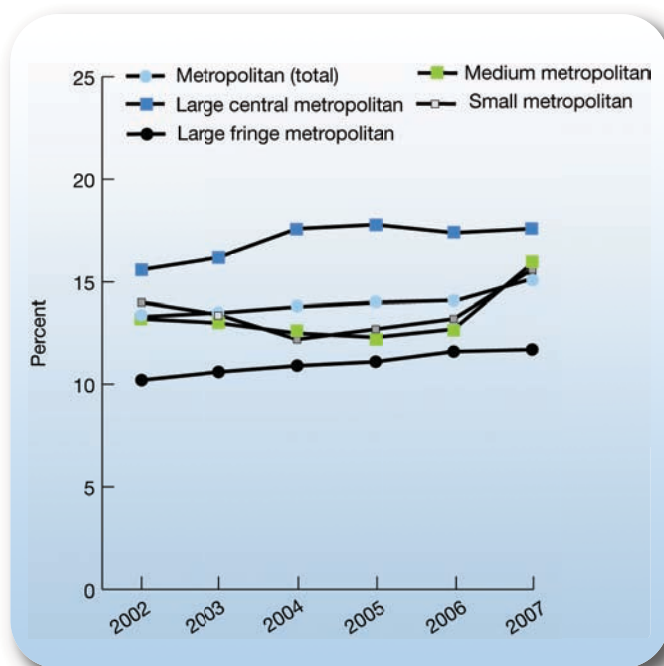
Prolonged periods of uninsurance can have a particularly serious impact on a person's health and stability. Uninsured people often postpone seeking care, have difficulty obtaining care when they ultimately seek it, and may have to bear the full brunt of health care costs. Over time, the cumulative consequences of being uninsured compound, resulting in a population at particular risk for suboptimal health care and health status.

**Figure 9.3. People under age 65 who were uninsured all year, by age, gender, and residence location, 2002-2007**





# Access to Health Care



**Source:** Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2002-2007.

**Denominator:** Civilian noninstitutionalized population under age 65.

- Overall, from 2002 to 2007, the percentage of people under age 65 who were uninsured all year worsened (from 13.4% to 15.2%; data not shown).
- From 2002 to 2007, children ages 0-17 were least likely to be uninsured all year, while adults ages 18-44 were most likely to be uninsured all year (in 2007, 7.9% for ages 0-17 and 21.3% for ages 18-44; Figure 9.3).
- From 2002 to 2007, females were less likely to be uninsured all year than males (in 2007, 13.0% compared with 17.4%).
- In 2007, among metropolitan areas, residents of large fringe metropolitan areas were least likely to have been uninsured all year (11.7%) while residents of large central metropolitan areas were most likely to be uninsured all year (17.6%).
- In 2007, there was no statistically significant difference overall in the percentage of people who were uninsured all year between residents of metropolitan areas and residents of nonmetropolitan areas (15.2% compared with 14.9%).

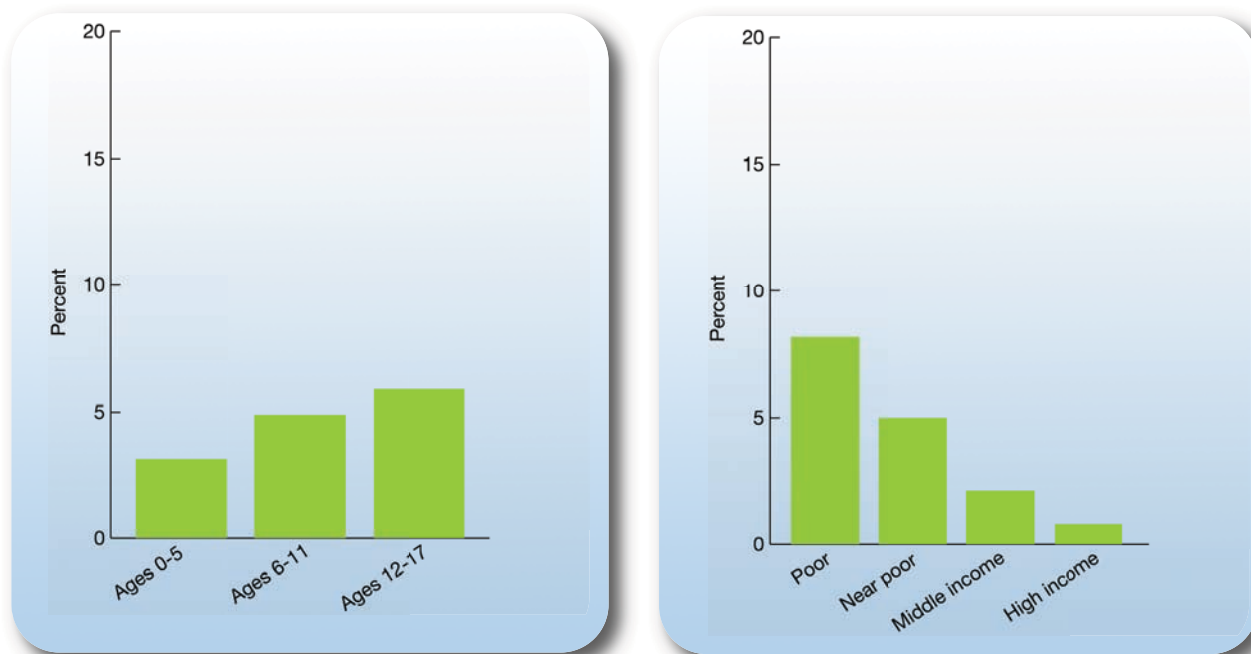
Also, in the NHDR:

- In 2007, Asians were less likely to be uninsured all year compared with Whites, while Hispanics were more likely to be uninsured all year compared with non-Hispanic Whites.
- Poor people and people with less than a high school education were much more likely to be uninsured all year than high-income people and people with at least some college education.
- People who spoke a language other than English at home were more likely to be uninsured all year than people who spoke English at home.



# Access to Health Care

Figure 9.4. Children who were uninsured for the past 12 months, by age and income, 2007



**Source:** Health Resources and Services Administration, Maternal and Child Health Bureau; Centers for Disease Control and Prevention, National Center for Health Statistics, National Survey of Children's Health, 2007.

**Denominator:** Children under age 18.

**Note:** Analyses performed by the Child and Adolescent Health Measurement Initiative, Data Resource Center for Child and Adolescent Health (<http://childhealthdata.org>).

- In 2007, children ages 6-11 and 12-17 were more likely to be uninsured than children ages 0-5 (4.9% and 5.9%, respectively, compared with 3.1%; Figure 9.4).
- Poor children were more than 10 times as likely as high-income children to be uninsured for the past 12 months (8.2% compared with 0.8%). Near-poor children were more than six times as likely and middle-income children were more than twice as likely as high-income children to be uninsured (5.0% and 2.1%, respectively, compared with 0.8%).

Also, in the NHDR:

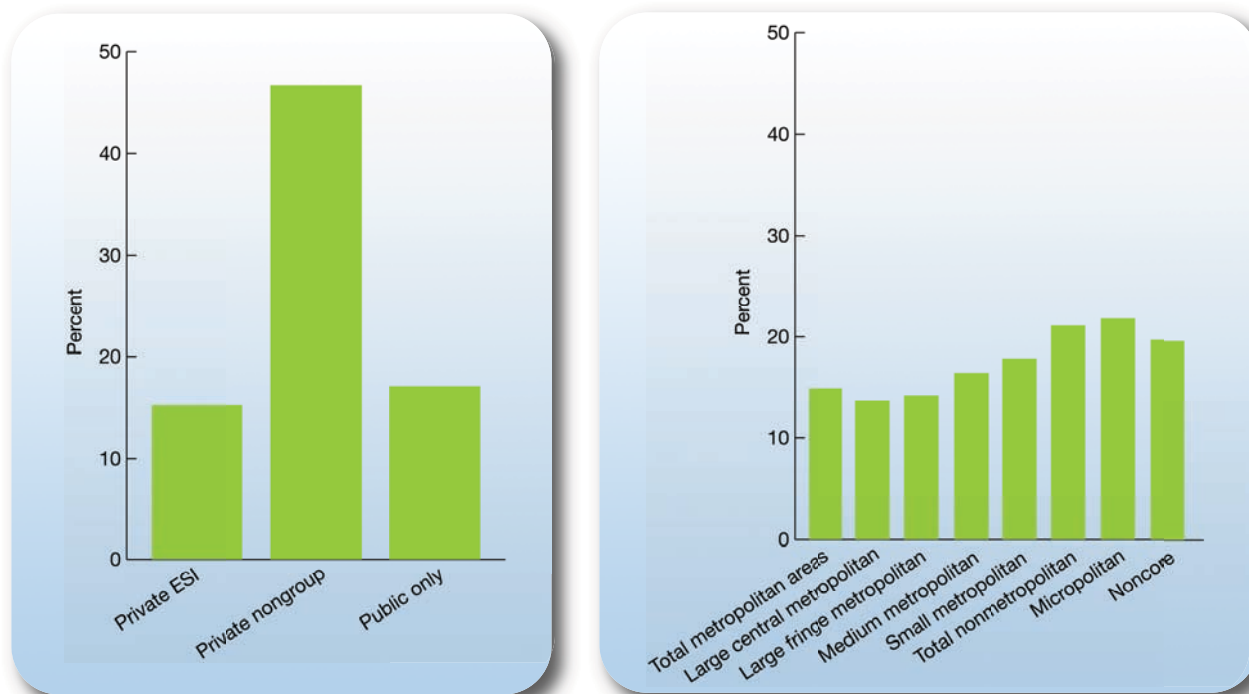
- Black children were more likely than non-Hispanic White children to be uninsured for the past 12 months.
- Hispanic children were about five times as likely to be uninsured as non-Hispanic White children (12.0% compared with 2.4%).

## Financial Burden of Health Care Costs

Health insurance is supposed to protect individuals from the burden of high health care costs. However, even with health insurance, the financial burden for health care can still be high and is increasing.<sup>8</sup> High premiums and out-of-pocket payments can be a significant barrier to accessing needed medical treatment and preventive care.<sup>9</sup> One way to assess the extent of financial burden is to determine the percentage of family income spent on a family's health insurance premium and out-of-pocket medical expenses.

# Access to Health Care

**Figure 9.5. People under age 65 whose family's health insurance premium and out-of-pocket medical expenses were more than 10% of total family income, by insurance and geographic region, 2007**



**Key:** ESI = employer-sponsored insurance.

**Source:** Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2007.

**Denominator:** Civilian noninstitutionalized population under age 65.

**Note:** Total financial burden includes premiums and out-of-pocket costs for health care services.

- Overall, in 2007 about 16.3% of people under age 65 had health insurance premium and out-of-pocket medical expenses that were more than 10% of total family income (data not shown).
- The percentage of people under age 65 whose family's health insurance premium and out-of-pocket medical expenses were more than 10% of total family income was nearly three times as high for individuals with private nongroup insurance as for individuals with private employer-sponsored insurance (46.7% compared with 15.8%; Figure 9.5). There was no significant difference between publicly insured individuals and individuals with employer-sponsored insurance.
- The percentage of people under age 65 whose family's health insurance premium and out-of-pocket medical expenses were more than 10% of total family income was higher for individuals living in nonmetropolitan areas than for those in metropolitan areas overall (21.1% compared with 15.4%).
- Individuals living in noncore areas were more likely than individuals living in large central metropolitan areas to have health insurance premium and out-of-pocket medical expenses of more than 10% of family income (19.7% compared with 14.0%).

Also, in the NHDR:

- American Indians and Alaska Natives and Hispanics were less likely than Whites and non-Hispanic Whites to have health insurance premium and out-of-pocket medical expenses that were more than 10% of total family income.

# Access to Health Care

- Poor individuals were almost five times as likely as high-income individuals to have health insurance premium and out-of-pocket medical expenses that were more than 10% of total family income.

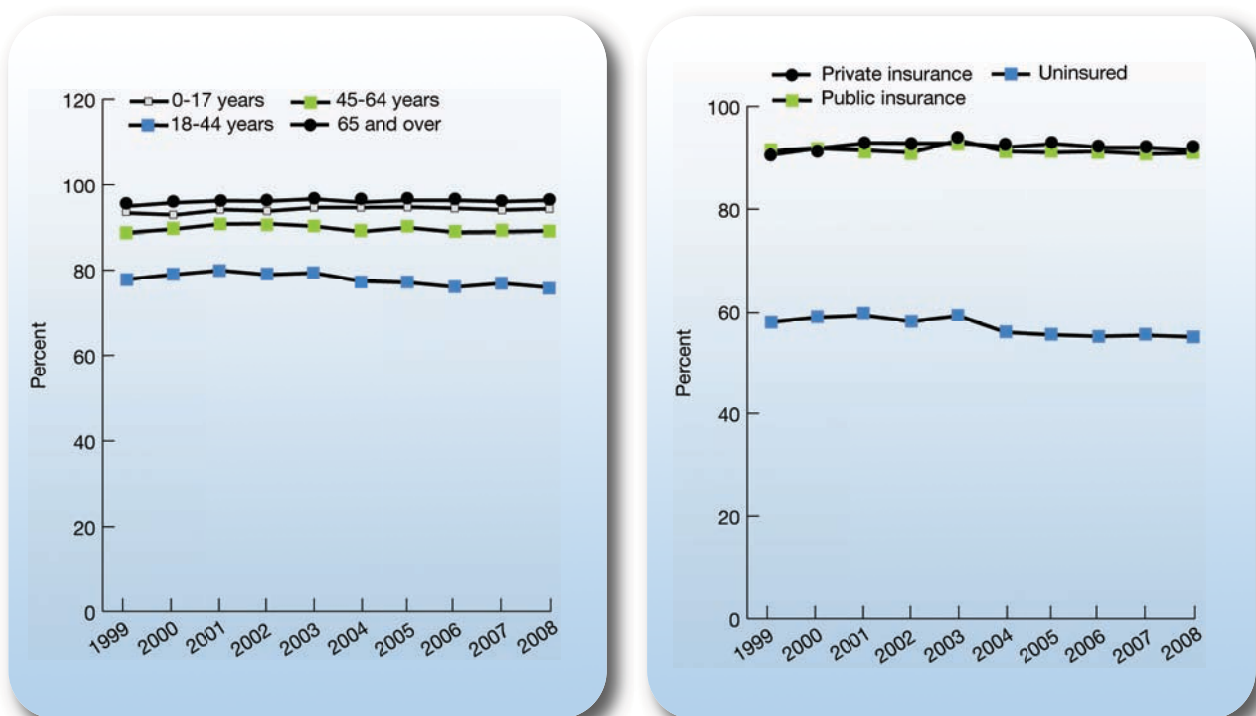
## Usual Source of Care

People with a usual source of care (a provider or facility where one regularly receives care) experience improved health outcomes and reduced disparities (smaller differences between groups)<sup>10</sup> and costs.<sup>11</sup> Evidence suggests that the effect on quality of the combination of health insurance and a usual source of care is additive.<sup>12</sup> In addition, people with a usual source of care are more likely to receive preventive health services.<sup>13</sup>

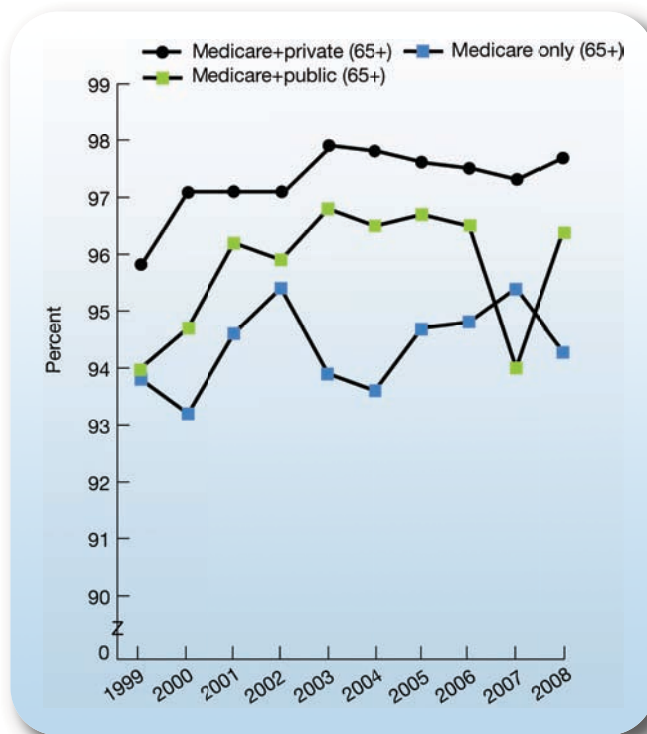
## Specific Source of Ongoing Care

More than 40 million Americans do not have a specific source of ongoing care.<sup>12</sup> The term “specific source of ongoing care” accounts for patients who may have more than one source of care, such as women of childbearing age and older people, who tend to have more than one doctor.

**Figure 9.6. People with a specific source of ongoing care, by age and insurance, 1999-2008**



# Access to Health Care



**Source:** Centers for Disease Control and Prevention, National Center for Health Statistics, National Health Interview Survey, 1999-2008.

**Denominator:** Civilian noninstitutionalized population.

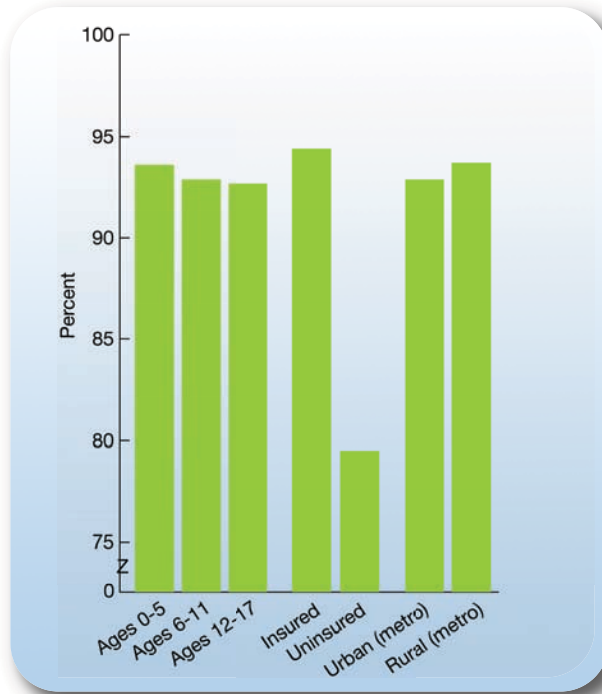
- Overall, 86.1% of people had a specific source of ongoing care in 2008 (data not shown).
- In 2008, the percentage of people with a specific source of ongoing care was much lower for uninsured people than for people with private insurance (Figure 9.6).
- In 2008, for people age 65 and over, the percentage of people with a specific source of ongoing care was lower for people with Medicare only than for people with Medicare and private insurance (94.3% compared with 97.7%).

Also, in the NHDR:

- In 2008, the percentage of people with a specific source of ongoing care was lower for Blacks than for Whites and significantly lower for Hispanics than for non-Hispanic Whites.
- In 2008, the percentage of people with a specific source of ongoing care was significantly lower for poor people than for high-income people. The percentage was also lower for people with less than a high school education and people with a high school education than for people with at least some college education.

# Access to Health Care

**Figure 9.7. Children who have a usual source of care, 2007, by age, insurance, and residence location**



**Source:** Health Resources and Services Administration, Maternal and Child Health Bureau; Centers for Disease Control and Prevention, National Center for Health Statistics, National Survey of Children's Health, 2007.

**Denominator:** Children under age 18.

**Note:** Analyses performed by the Child and Adolescent Health Measurement Initiative, Data Resource Center for Child and Adolescent Health (<http://childhealthdata.org>).

- In 2007, about 93.1% of children had a usual source of care (data not shown).
- Uninsured children were less likely than children with health insurance to have a usual source of care (79.5% compared with 94.4%; Figure 9.7).

Also, in the NHDR:

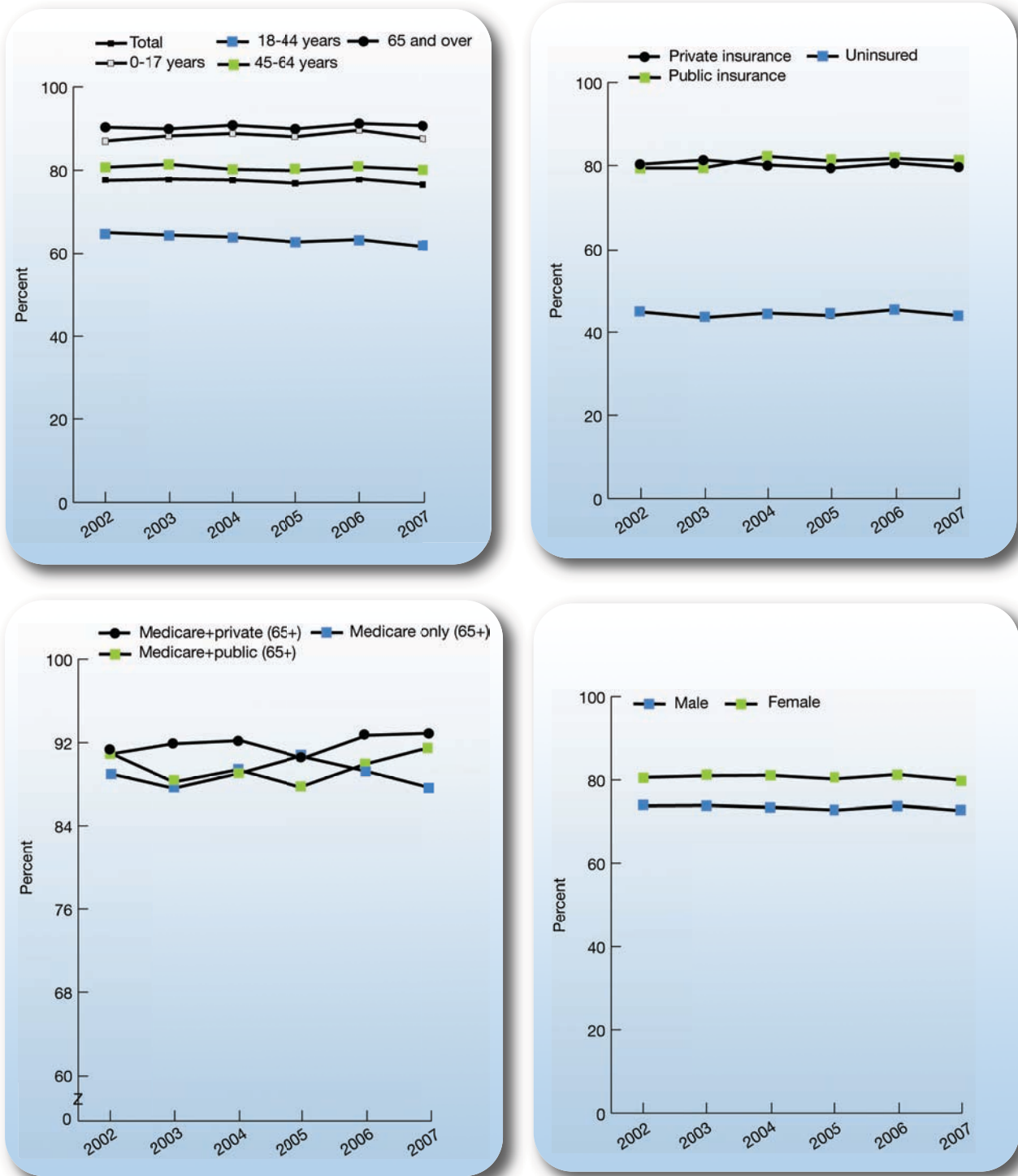
- Black and Asian children and children of more than one race were less likely than White children to have a usual source of care (89.4%, 92.1%, and 91.4%, respectively, compared with 96.8%).

## Usual Primary Care Provider

Having a usual primary care provider (a doctor or nurse from whom one regularly receives care) is associated with patients' greater trust in their provider<sup>14</sup> and with good provider-patient communication. These factors increase the likelihood that patients will receive appropriate care.<sup>15</sup> By learning about patients' diverse health care needs over time, a usual primary care provider can coordinate care (e.g., visits to specialists) to better meet patients' needs.<sup>16</sup> Having a usual primary care provider correlates with receipt of higher quality care.<sup>17, 18</sup>

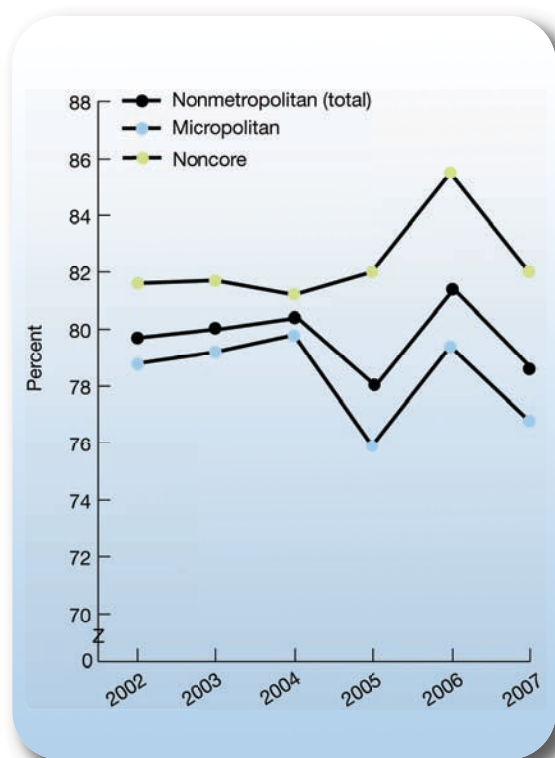
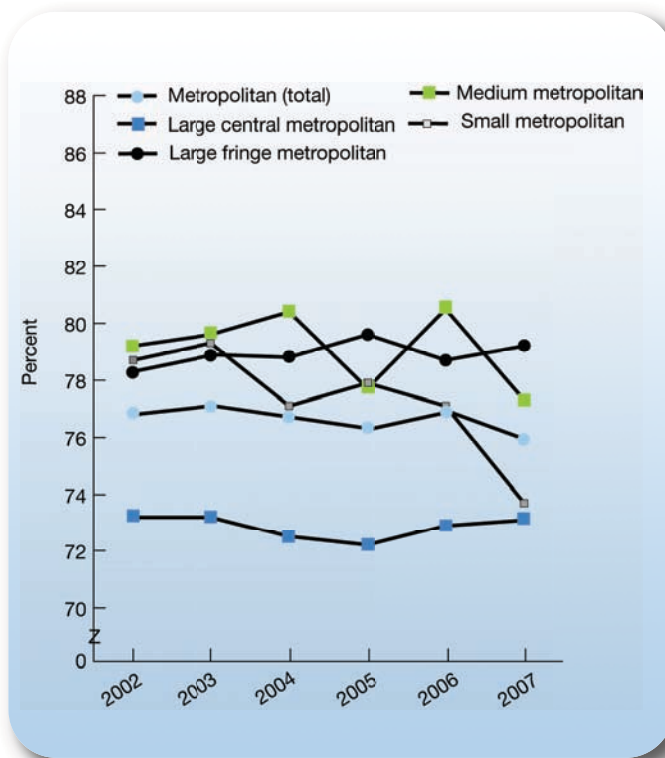
# Access to Health Care

Figure 9.8. People with a usual primary care provider, by age, insurance, gender, and residence location, 2002-2007





# Access to Health Care



**Source:** Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2002-2007.

**Denominator:** Civilian noninstitutionalized population.

**Note:** A usual primary care provider is defined as the source of care that a person usually goes to for new health problems, preventive health care, and referrals to other health professionals.

- Overall, in 2007, about 76.3% of people had a usual primary care provider (data not shown).
- People ages 18-44 were least likely to have a usual primary care provider, while people age 65 and over were most likely to have a usual primary care provider (61.5% and 90.6%, respectively; Figure 9.8).
- In 2007, uninsured people were almost half as likely as people with private insurance to have a usual primary care provider (44.0% compared with 79.4%).
- In 2007, people age 65 and over with Medicare only were less likely than people with Medicare and private insurance to have a usual primary care provider (87.7% compared with 92.9%).
- In 2007, females were more likely to have a usual primary care provider than males (79.9% compared with 72.6%).
- In 2007, residents of nonmetropolitan areas were more likely to have a usual primary care provider than residents of metropolitan areas overall (78.6% compared with 75.9%).
- In 2007, residents of large central metropolitan areas and residents of small metropolitan areas were less likely than residents of large fringe metropolitan areas to have a primary care provider (73.1% and 73.7%, respectively, compared with 79.2%).
- In 2007, among nonmetropolitan areas, residents of noncore areas were more likely to have a usual primary care provider than residents of micropolitan areas (82.0% compared with 76.8%).

# Access to Health Care

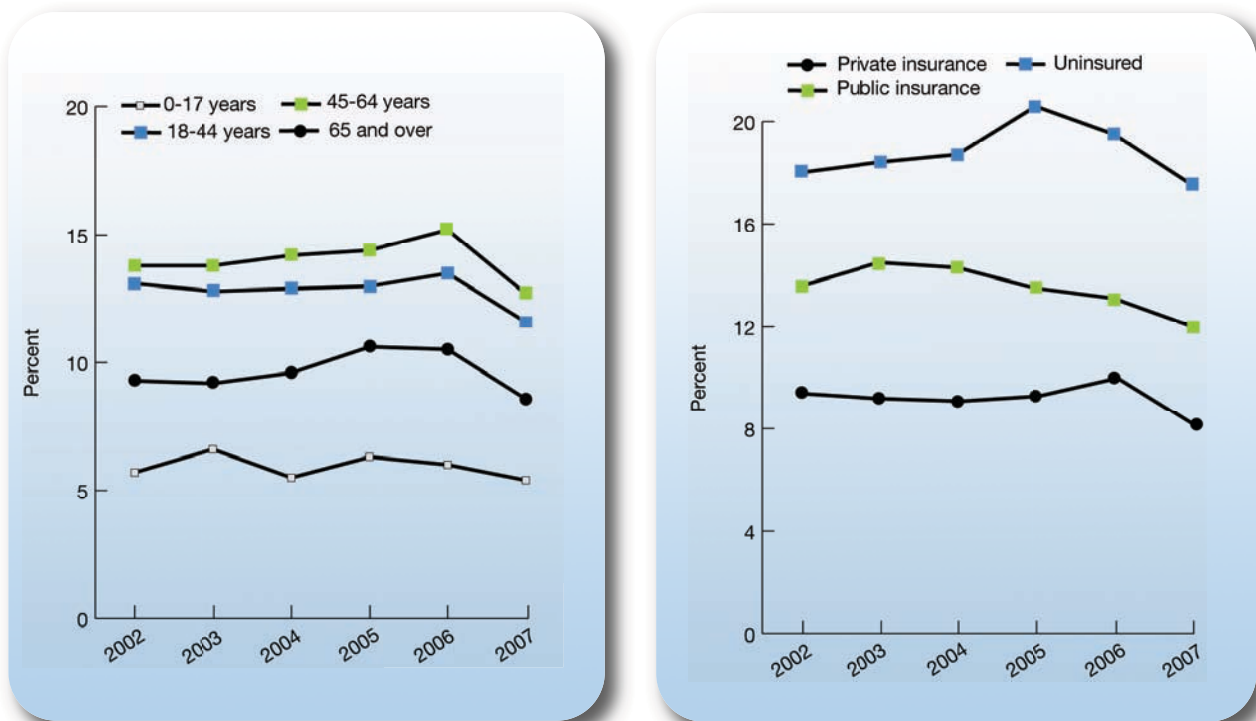
Also, in the NHDR:

- Blacks, Asians, and Hispanics were less likely than Whites and non-Hispanic Whites to have a usual primary care provider.
- Poor, near-poor, and middle-income people were less likely to have a usual primary care provider than people with high income. People with less than a high school education and people with a high school education were less likely than people with at least some college education to have a usual primary care provider.
- The percentage of people who had a primary care provider was lower for people who spoke a language other than English at home than the proportion for people who spoke English at home.

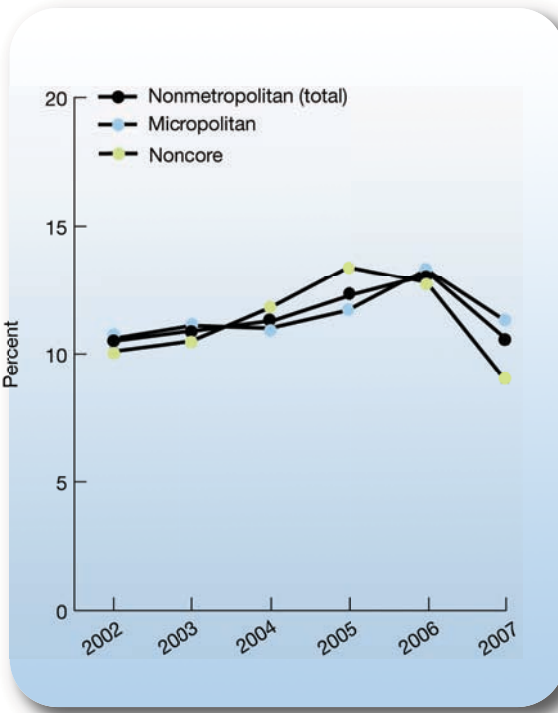
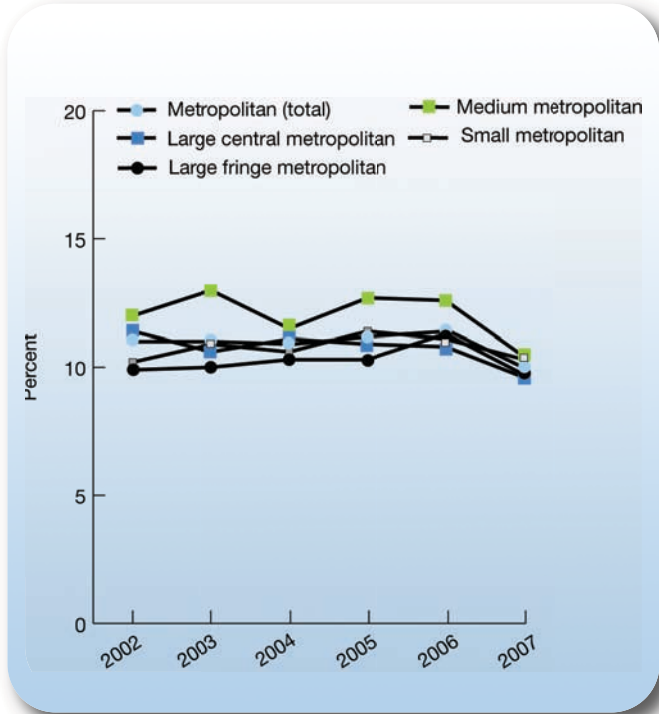
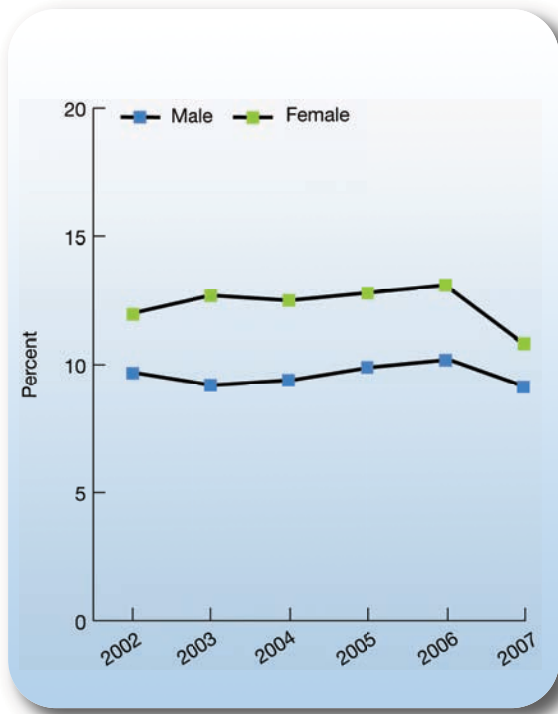
## Patient Perceptions of Need

Patient perceptions of need include perceived difficulties or delays in obtaining care and problems getting care as soon as wanted. Although patients may not always be able to assess their need for care, problems getting care when patients perceive that they are ill or injured likely reflect significant barriers to care.

**Figure 9.9. People who were unable to get or delayed in getting needed medical care, dental care, or prescription medicines in the last 12 months, by age, insurance, gender, and residence location, 2002-2007**



# Access to Health Care



**Source:** Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2002-2007.  
**Denominator:** Civilian uninstitutionalized population.

# Access to Health Care

- Overall, in 2007, 10% of people were unable to receive or delayed in receiving needed medical care, dental care, or prescription medicines. This percentage did not change significantly from 2002 (data not shown).
- In 2007, people ages 18-44, 45-64, and 65 and over were more likely to be unable to get or delayed in getting needed medical care, dental care, or prescription medicines than people ages 0-17 (11.6%, 12.7%, and 8.6%, respectively, compared with 5.4%; Figure 9.9).
- In 2007, for people under age 65, the percentage of people who were unable to get or delayed in getting needed medical care, dental care, or prescription medicines was more than twice as high for people with no health insurance as for people with private insurance (17.5% compared with 8.1%). The percentage was also worse for people with public insurance than for people with private insurance (12.0% compared with 8.1%).
- In all years, females were more likely than males to be unable to get or delayed in getting needed medical care, dental care, or prescription medicines.
- There were no statistically significant differences between residents living in metropolitan and nonmetropolitan areas or within those areas.

Also, in the NHDR:

- The percentage of people who were unable to get or delayed in getting needed medical care, dental care, or prescription medicines was lower for Asians than for Whites and lower for Hispanics than for non-Hispanic Whites.
- The percentage of people who were unable to get or delayed in getting needed medical care, dental care, or prescription medicines was lower for people who spoke a language other than English at home than for people who spoke English at home.



# Access to Health Care

## References

1. Institute of Medicine, Committee on Monitoring Access to Personal Health Care Services. *Access to health care in America*. Washington, DC: National Academies Press; 1993.
2. Bierman AS, Magari ES, Jette AM, et al. Assessing access as a first step toward improving the quality of care for very old adults. *J Ambul Care Manage* 1998;21(3):17-26.
3. Hadley J. Insurance coverage, medical care use, and short-term health changes following an unintentional injury or the onset of a chronic condition. *Jama* 2007;297(10): 1073-84.
4. Institute of Medicine. *Insuring America's health: principles and recommendations*. *Acad Emerg Med* 2004;11(4): 418-22.
5. Centers for Disease Control and Prevention. Self-assessed health status and selected behavioral risk factors among persons with and without health-care coverage—United States, 1994-1995. *MMWR* 1998;47(9): 176-80.
6. Jacoby M, Sullivan T, Warren E. Medical problems and bankruptcy filings. *Norton's Bankruptcy Law Advisor* 2000 May;5:1-12.
7. Hadley J. Sicker and poorer—the consequences of being uninsured: a review of the research on the relationship between health insurance, medical care use, health, work, and income. *Med Care Res Rev* 2003;60(2 Suppl):3S-75S; discussion 76S-112S.
8. Banthin JS, Bernard DM. Changes in financial burdens for health care: national estimates for the population younger than 65 years, 1996 to 2003. *Jama* 2006;296(22):2712-19.
9. Alexander GC, Casalino LP, Meltzer DO. Patient-physician communication about out-of-pocket costs. *Jama* 2003;290(7): 953-58.
10. Starfield B, Shi L. The medical home, access to care, and insurance: a review of evidence. *Pediatrics* 2004;113(5 Suppl): 1493-98.
11. De Maeseener J, De Prins L, Gossett C, et al. Provider continuity in family medicine: does it make a difference for total health care costs? *Ann Fam Med* 2003;(1):144-48.
12. Phillips R, Proser M, Green L, et al. The importance of having health insurance and a usual source of care. *Am Fam Physician* 2004 Sep 15;70(6):1035.
13. Ettner SL. The timing of preventive services for women and children: the effect of having a usual source of care. *Am J Pub Health* 1996;86(12):1748-54.
14. Mainous AG, Baker R, Love MM, et al. Continuity of care and trust in one's physician: evidence from primary care in the United States and the United Kingdom. *Fam Med* 2001;33(1):22-27.
15. Starfield B. *Primary care: balancing health needs, services, and technology*. New York: Oxford University Press; 1998.
16. Forrest CB, Starfield B. The effect of first-contact care with primary care clinicians on ambulatory health care expenditures. *J Fam Pract* 1996;43(1):40-48.
17. Parchman ML, Burge SK. Continuity and quality of care in type 2 diabetes: a Residency Research Network of South Texas study. *J Fam Pract* 2002;51(7):619-24.
18. Inkelas M, Schuster MA, Olson LM, et al. Continuity of primary care clinician in early childhood. *Pediatrics* 2004;113(6 Suppl): 1917-25.

**U.S. Department of  
Health and Human Services**

Agency for Healthcare Research and Quality  
540 Gaither Road  
Rockville, MD 20850



AHRQ Publication No. 11-0004  
March 2011