

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.¹ 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.² 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.³

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.

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- 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.

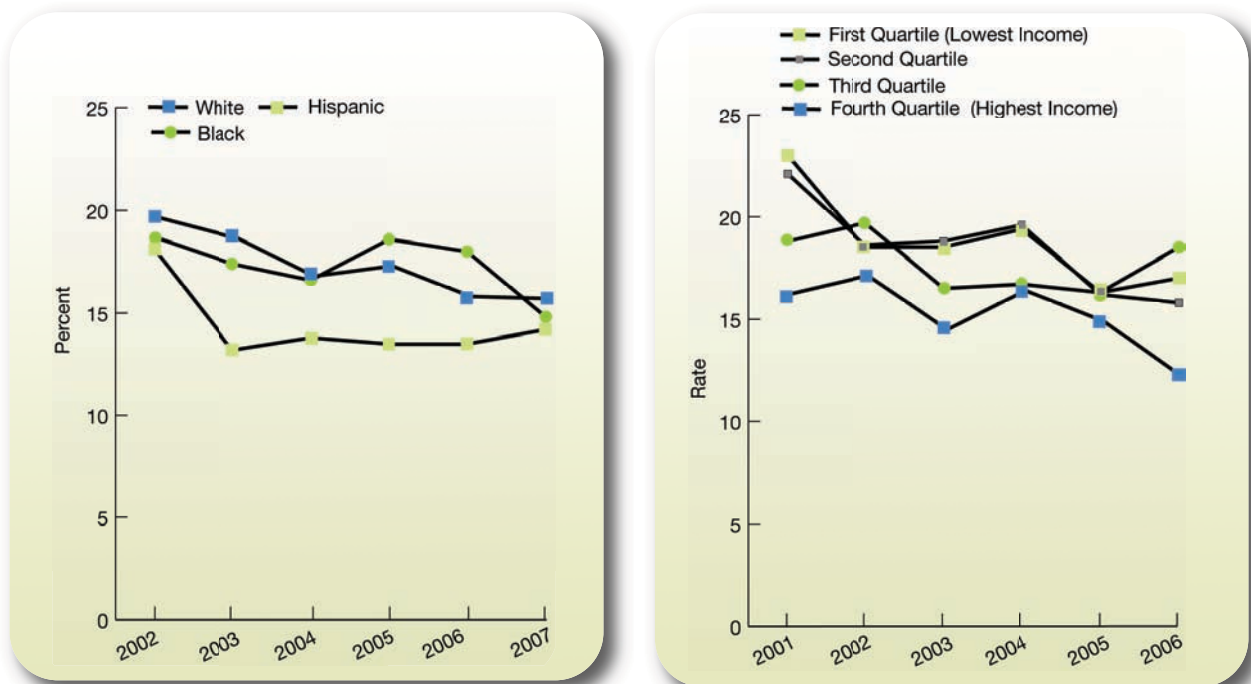
Consensus has yet to emerge about the appropriate framework and acceptable measures of efficiency, and the examples provided are designed to stimulate productive ongoing discussion about health care efficiency. We anticipate regularly reporting several measures in Efficiency chapters in future years. 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.^{4,i}

Figure 7.1. Adults age 65 and over who received potentially inappropriate prescription medications in the calendar year, by race/ethnicity and income, 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. Whites and Blacks are non-Hispanic.

ⁱ 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, dipyridamole, ticlopidine, methylodopa, reserpine, disopyramide, oxybutynin, chlorpheniramine, cyproheptadine, diphenhydramine, hydroxyzine, promethazine, and propoxyphene.

- 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 race/ethnicity or income groups (Figure 7.1).
- For the first three income quartiles, the percentage of patients who received potentially inappropriate medications was higher than it was for the fourth quartile (highest income) (first quartile, 17.0%; second quartile, 15.8%; third quartile, 18.5%; compared with 12.2%).

Also, in the NHQR:

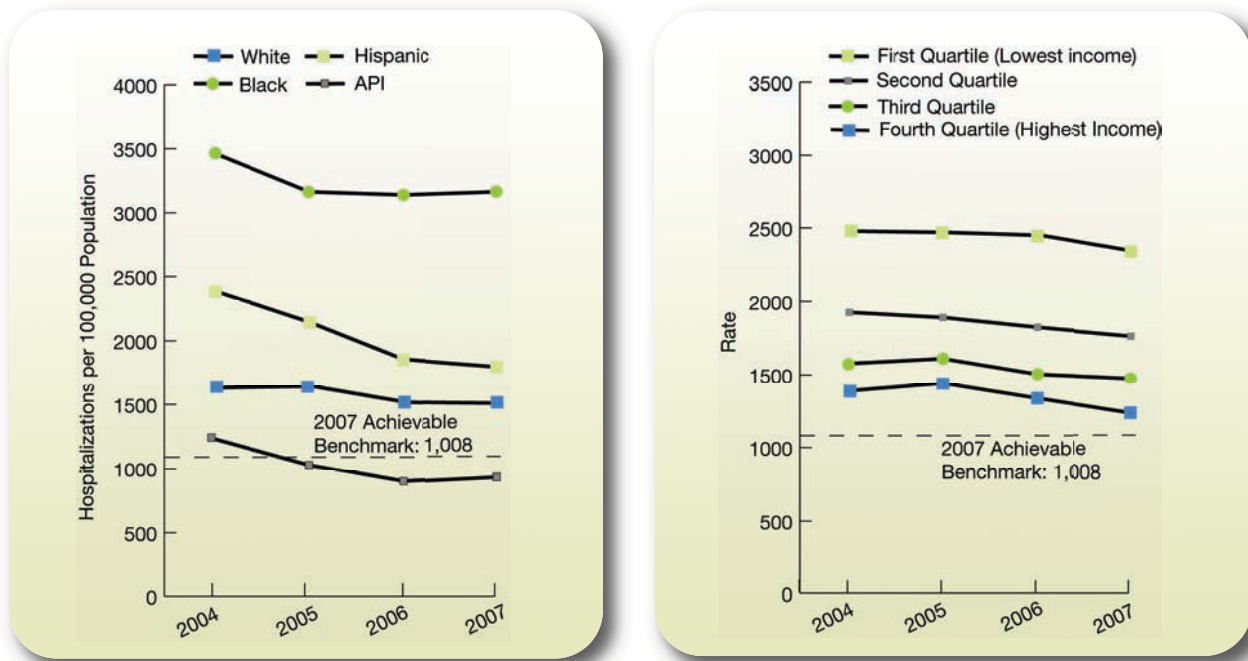
- For those living in nonmetropolitan areas, the percentage of patients who received potentially inappropriate medications was significantly higher than for those living in metropolitan areas.
- The percentage of female patients who received potentially inappropriate medications was significantly higher than for male patients.

Disparities in Potentially Avoidable Hospitalizations

To address potentially avoidable hospitalizations 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.

A critical caveat should be noted regarding potentially avoidable hospitalizations. Comparatively high rates of potentially avoidable hospitalizations may reflect inefficiency in the health care system. Therefore, groups of patients should not be “blamed” for receiving less efficient care. Instead, examining disparities in efficiency may help make the business case for addressing disparities in care. Investments that reduce disparities in access to high-quality outpatient care may help reduce rates of avoidable hospitalizations among groups that have high rates.

Figure 7.2. Potentially avoidable hospitalization rates, by race/ethnicity and income, 2004-2007



Key: API = Asian or Pacific Islander.

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. White, Black, and Asian or Pacific Islander populations are non-Hispanic. Income quartiles are based on median income of ZIP Code of patient's residence.

- In 2007, rates of potentially avoidable hospitalizations were higher among Blacks compared with Whites (3,164 compared with 1,508 per 100,000 population; Figure 7.2). Rates were lower among Asians and Pacific Islanders (936 per 100,000 admissions) compared with Whites.
- Rates of potentially avoidable hospitalizations were higher among residents of areas in the lowest and second income quartile compared with residents of the highest income quartile (2,341 and 1,766, respectively, compared with 1,234 per 100,000 population).
- Rates of avoidable hospitalizations for chronic conditions were higher among Blacks and Hispanics compared with Whites (2,113 and 1,020.6, respectively, compared with 863 per 100,000 population; data not shown). Rates were lower among Asians and Pacific Islanders (489 per 100,000 population) compared with Whites (data not shown).
- Rates of potentially avoidable hospitalizations for chronic conditions were higher among residents of areas in the lowest and second income quartile compared with residents of the highest income quartile (1286.3, and 786.8, respectively, compared with 634 per 100,000 population; data not shown).
- Rates of potentially avoidable hospitalizations for acute conditions were higher among Blacks compared with Whites (840 compared with 645 per 100,000 population; data not shown).
- There were no significantly different rates of potentially avoidable hospitalizations for acute conditions among income groups (data not shown).

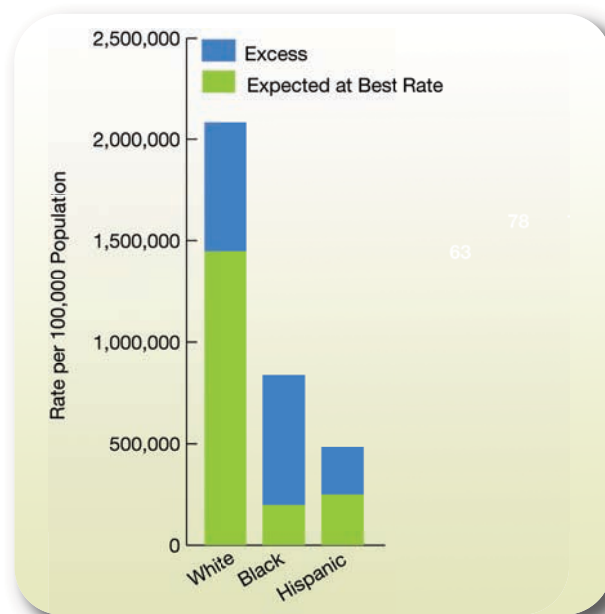
Efficiency

- In 2007, the overall top 4 State achievable benchmark for potentially avoidable hospitalizations was 1,008 hospitalizations per 100,000 population.ⁱⁱ The overall achievable benchmark could be attained in 14 years.
- The only racial/ethnic group to attain the achievable benchmark as of 2007 was Asians, whereas Whites could attain the benchmark in about 10 years. Blacks would not attain the benchmark for about 23 years, and Hispanics in just under 4 years.
- High-income groups would attain the benchmark sooner than lower income groups (first [lowest] quartile, about 31 years; second quartile, just under 13.9 years; third quartile, just over 11 years; and fourth [highest] quartile, 4 years).

Excess Hospitalizations

The following analysis estimates numbers of excess preventable hospitalizations for 2007 by comparing adjusted rates of the AHRQ PQI composite with the benchmark rate. The benchmark rate was set by the States with rates in top 10%. For excess preventable hospitalizations to be calculated, the difference between a group's rate and the benchmark rate was multiplied by the number of persons in the group (for example, for Hispanics, the difference between the Hispanic rate and the benchmark rate was multiplied by the number of Hispanics).

Figure 7.3. Excess number of hospitalizations for AHRQ Prevention Quality Indicator composite conditions, by race/ethnicity, 2007



Source: Agency for Healthcare Research and Quality, Healthcare Cost and Utilization Project, State Inpatient Databases (SID) disparities analysis file, 2007.

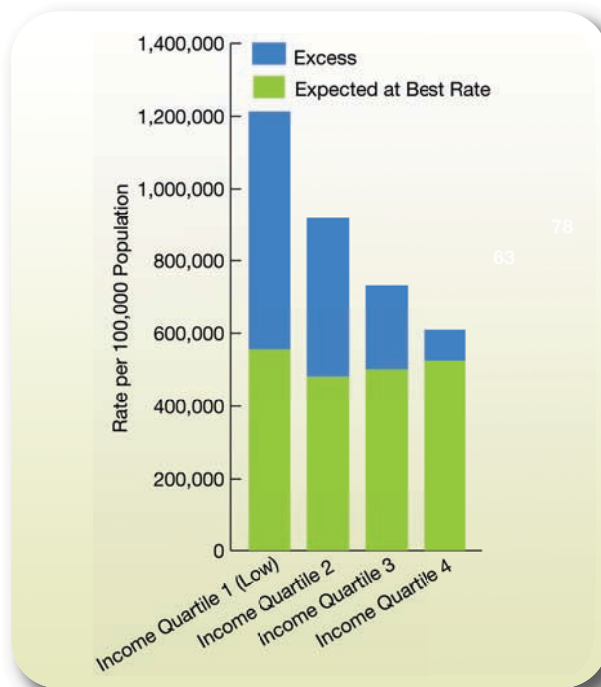
ⁱⁱ The top 4 States that contributed to the achievable benchmark are Hawaii, Oregon, Utah, and Washington.

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- In 2007, if Whites had the benchmark rate of preventable hospitalizations, they would have had almost 640,000 fewer hospitalizations (Figure 7.3). Instead of costing \$15.6 billion, preventable hospitalization among Whites would have cost only \$10.8 billion, saving \$4.8 billion.
- If Blacks had the benchmark rate of preventable hospitalizations, they would have had more than 530,000 fewer hospitalizations. Instead of costing \$6.1 billion in 2007, preventable hospitalization among Blacks would have cost only \$1.9 billion, saving \$4.2 billion.
- If Hispanics had the benchmark rate of preventable hospitalizations, they would have had almost 230,000 fewer hospitalizations. Instead of costing \$4.2 billion in 2007, preventable hospitalization among Hispanics would have cost only \$2.3 billion, saving \$1.9 billion.
- Because the overall rate among Asians and Pacific Islanders was below the benchmark rate, there are no estimated excess preventable hospitalizations for this group.

Comparisons with the 4 State achievable benchmark for the composite rate of preventable hospitalizations in 2007 are used to estimate excess preventable hospitalizations by area income. Area income refers to the median income of the ZIP Code in which the patient resides.

Figure 7.4. Excess number of hospitalizations for AHRQ Prevention Quality Indicator composite conditions, by income, 2007



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

- If residents of the neighborhoods in the lowest income quartile had the benchmark rate of preventable hospitalizations, they would have had more than 680,000 fewer hospitalizations (Figure 7.4). Instead of costing \$8.8 billion in 2007, preventable hospitalization among income quartile 1 residents would have cost only \$3.9 billion, saving \$4.9 billion.

- If residents of income quartile 2 neighborhoods had the benchmark rate of preventable hospitalizations, they would have had almost 360,000 fewer hospitalizations. Instead of costing \$6.3 billion in 2007, preventable hospitalization would cost only \$3.7 billion, saving \$2.6 billion.
- If residents of income quartile 3 neighborhoods had the benchmark rate of preventable hospitalizations, they would have had almost 230,000 fewer hospitalizations. Instead of costing \$5.7 billion in 2007, preventable hospitalization would cost only \$4.0 billion, saving \$1.7 billion.
- If residents of the highest income quartile neighborhoods had the benchmark rate of preventable hospitalizations, they would have had about 115,000 fewer hospitalizations. Instead of costing \$5.4 billion in 2007, preventable hospitalization would cost only \$4.4 billion, saving \$1.0 billion.

Perforated Appendixes

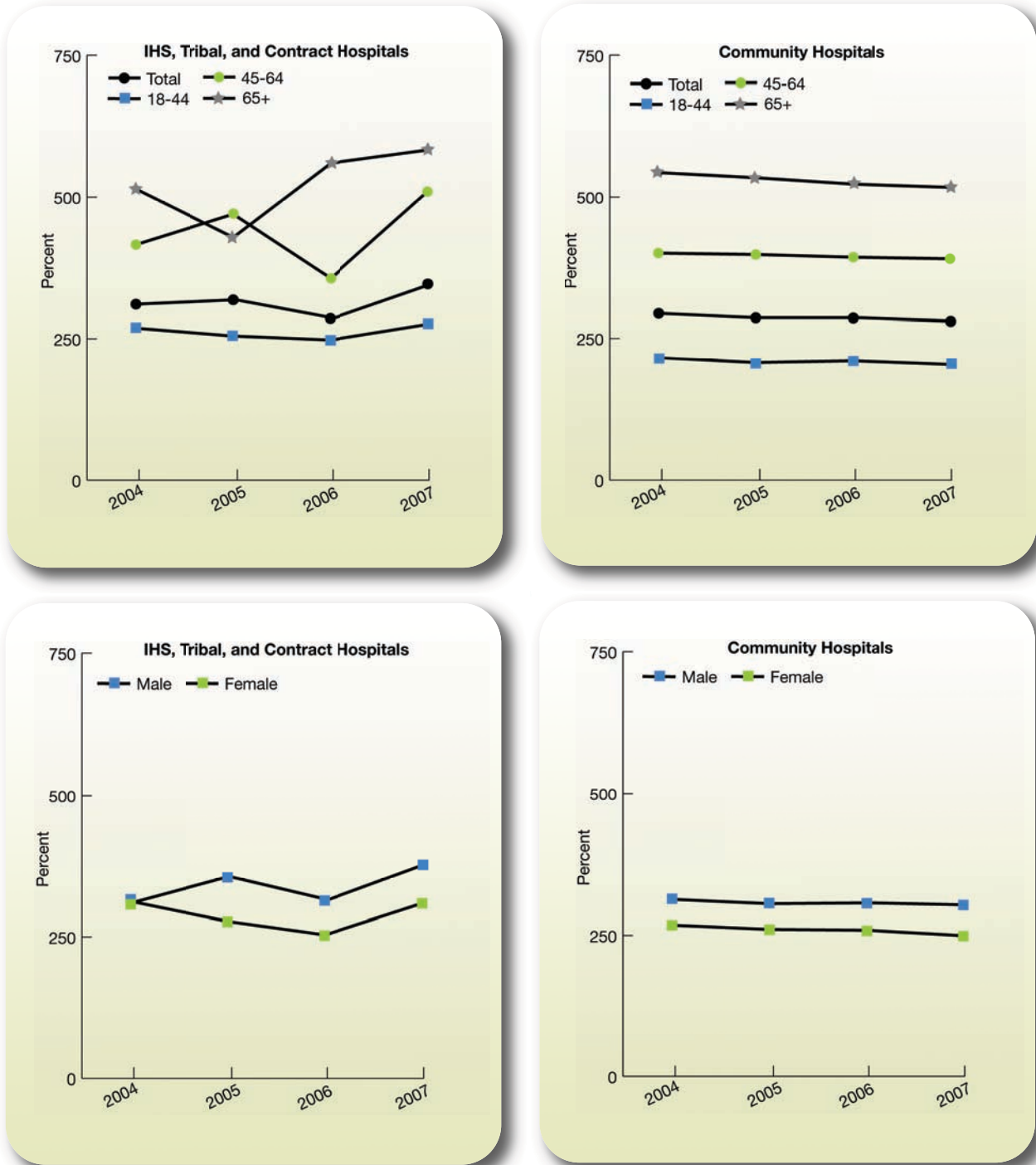
Potentially avoidable admissions are hospitalizations that might have been averted by good outpatient care. They relate to conditions for which good outpatient care can prevent the need for hospitalization or for which early intervention can prevent complications or more severe disease. Although all admissions for these conditions cannot be avoided, rates in populations tend to vary with access to primary care.⁵ For example, better access to care should reduce the percentage of appendicitis admissions in which rupture has occurred.

Nationwide, many American Indians and Alaska Natives (AI/ANs) who are members of a federally recognized Tribe rely on the Indian Health Service (IHS) to provide access to health care in the counties on or near reservations. Because data on AI/ANs obtained from most Federal and State sources are incomplete, the NHDR addresses the data gap for this measure by examining data submitted to the IHS National Patient Information Reporting System (NPIRS) by IHS, Tribal, and contract hospitals.



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Figure 7.5. Perforated appendixes per 1,000 admissions for appendicitis, age 18 and over, in IHS, Tribal, and contract hospitals, and community hospitals, by age and gender, 2000-2007



Source: IHS, Tribal, and contract hospitals: Indian Health Service, NPIRS, National Data Warehouse, Workload and Population Data Mart, 2004-2007; community hospitals: Agency for Healthcare Research and Quality, HCUP SID disparities analysis file, 2004-2007.

- Between 2004 and 2007, the overall rate of perforated appendixes at Indian Health Service facilities did not change significantly (Figure 7.5).
- In 2007, the rates of perforated appendixes for those ages 45 to 64 and those age 65 and over were higher than for those ages 18-44 (509.7 and 583.3 per 1,000 appendicitis admissions, respectively, compared with 275.4).

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.

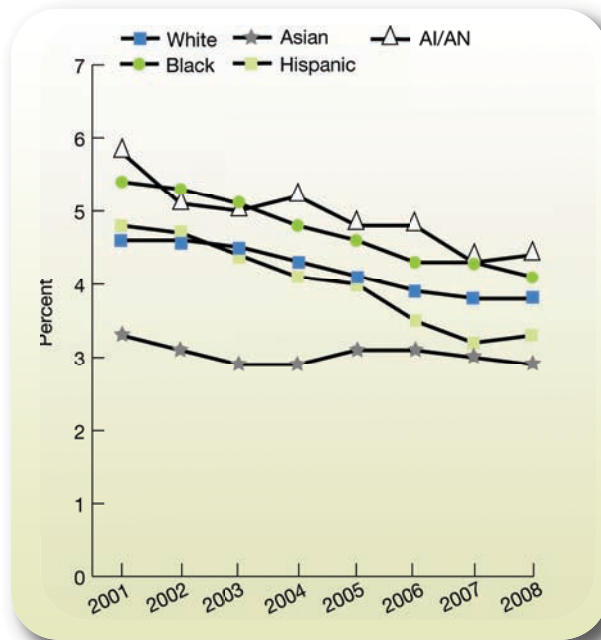
In contrast, Medicare home health and nursing home patients have regular contact with health providers, which should reduce rates of avoidable hospitalization. However, these patients are also more acutely ill, may become seriously ill when affected by a new illness, and may have multiple comorbidities. 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.

Efficiency

Figure 7.6. Medicare home health patients with potentially avoidable hospitalizations within 30 days of start of care, by race/ethnicity, 2001-2008



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

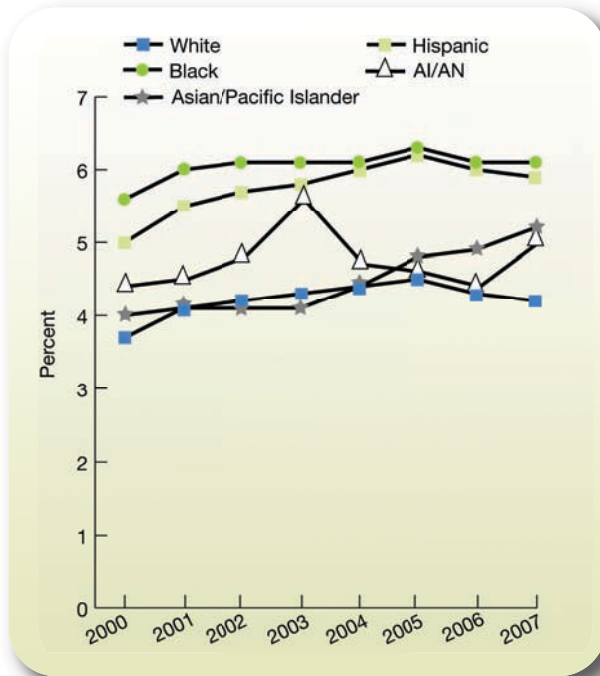
Source: Centers for Medicare & Medicaid Services, Outcome and Assessment Information Set linked with Medicare Part A claims (100%), 2001-2008.

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. Hispanics could include other races. All race categories could include Hispanics.

- Between 2001 and 2008, hospitalizations for potentially avoidable conditions within 30 days of home health episode start declined from 4.7% to 3.8% (data not shown).
- From 2001 to 2008, among all racial and ethnic groups except Asians, the percentage of potentially avoidable hospitalizations within 30 days of home health episode start significantly decreased (Figure 7.6).
- 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.

Figure 7.7. Skilled nursing home residents with potentially avoidable hospitalizations within 30 days of admission, by race/ethnicity, 2000-2007



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

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.

Note: American Indians/Alaska Natives, Asian/Pacific Islanders, Blacks, and Whites are non-Hispanic populations.

- Between 2000 and 2002, potentially avoidable hospitalizations within 30 days of skilled nursing home episode start increased by about 0.5% for all racial and ethnic groups except Asians and Pacific Islanders (Figure 7.7). During this time, the percentage for Asians and Pacific Islanders did not change.
- From 2002 to 2007, potentially avoidable hospitalizations within 30 days of skilled nursing home episode start plateaued for all racial and ethnic groups, except for Asians and Pacific Islanders. This percentage gradually rose (from 4.1% to 5.2%).
- 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.

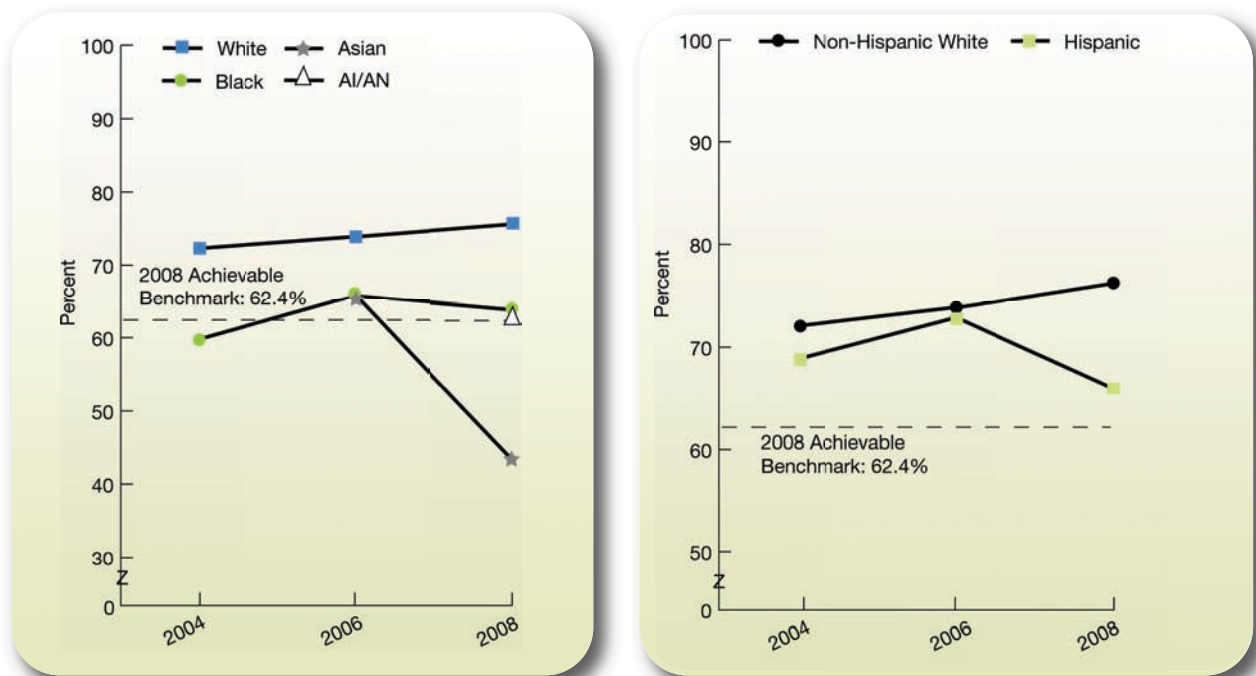
Potentially Harmful Preventive Services

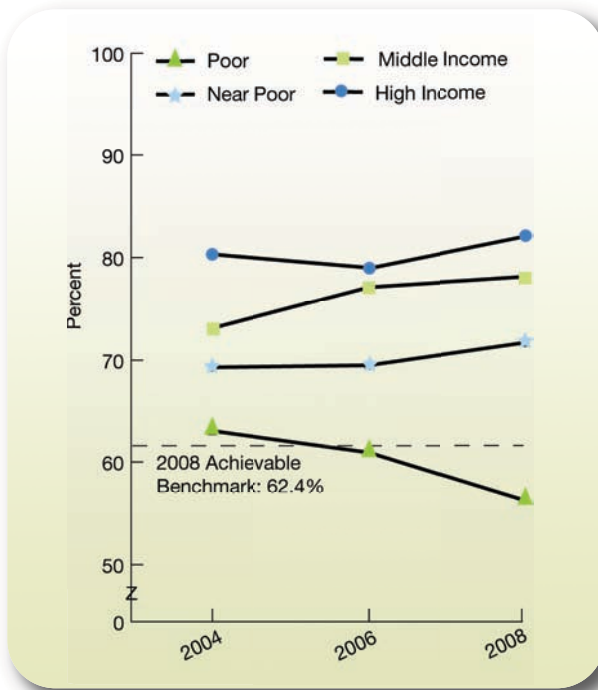
This section highlights waste and opportunities to reduce unnecessary costs. Waste includes overuse, underuse, and misuse of health care services. As it is one of the NPP priorities, the focus of this section is on overuse. Nevertheless, underuse and misuse are addressed in various sections of this report. 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.

Efficiency

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 2008⁶ 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 7.8. Males age 75 and over who reported having a prostate-specific antigen test or a digital rectal exam within the last 12 months, by race, ethnicity, and income, 2004, 2006, and 2008





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

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

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 was unavailable and all reported PSA tests and DREs are reflected in the data shown. Data for AI/ANs were statistically unreliable for 2004 and 2006.

- 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 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 (Figure 7.8).
- In 2008, the percentage of poor males age 75 and over who had a PSA test or a DRE within the last 12 months was lower than for high-income males.
- In 2008, the top 5 State benchmark for males age 75 and over who had a PSA or DRE exam was 62.4%.ⁱⁱⁱ There was no evidence of movement toward the benchmark, but Asian males and poor males had attained the benchmark.

ⁱⁱⁱ The Top 5 States that contributed to this benchmark are California, Hawaii, Louisiana, New Jersey, and Tennessee.

References

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