



# 2014 National Healthcare Quality and Disparities Report **CHARTBOOK ON PATIENT SAFETY**



Agency for Healthcare Research and Quality

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# **2014 NATIONAL HEALTHCARE QUALITY AND DISPARITIES REPORT PATIENT SAFETY CHARTBOOK**

## **U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES**

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## PATIENT SAFETY

### National Healthcare Quality and Disparities Report

This Patient Safety Chartbook is part of a family of documents and tools that support the National Healthcare Quality and Disparities Report (QDR). The QDR includes annual reports to Congress mandated in the Healthcare Research and Quality Act of 1999 (P.L. 106-129). These reports provide a comprehensive overview of the quality of health care received by the general U.S. population and disparities in care experienced by different racial, ethnic, and socioeconomic groups. The purpose of the reports is to assess the performance of our health system and to identify areas of strengths and weaknesses in the health care system along three main axes: access to health care, quality of health care, and priorities of the National Quality Strategy.

The reports are based on more than 250 measures of quality and disparities covering a broad array of health care services and settings. Data are generally available through 2012, although rates of uninsurance have been tracked through the first half of 2014. The reports are produced with the help of an Interagency Work Group led by the Agency for Healthcare Research and Quality (AHRQ) and submitted on behalf of the Secretary of Health and Human Services (HHS).

### Changes for 2014

Beginning with this 2014 report, findings on health care quality and health care disparities are integrated into a single document. This new National Healthcare Quality and Disparities Report highlights the importance of examining quality and disparities together to gain a complete picture of health care. This document is also shorter and focuses on summarizing information over the many measures that are tracked; information on individual measures will still be available through chartbooks posted on the Web (<http://www.ahrq.gov/research/findings/nhqdr/2014chartbooks/>).

The new QDR and supporting chartbooks are further integrated with the National Quality Strategy (NQS). The NQS has three overarching aims that build on the Institute for Healthcare Improvement's Triple Aim<sup>®</sup> and that support HHS's delivery system reform initiatives to achieve better care, smarter spending, and healthier people through incentives, information, and the way care is delivered. These aims are used to guide and assess local, State, and national efforts to improve health and the quality of health care.

To advance these aims, the NQS focuses on six priorities that address the most common health concerns that Americans face. Quality measures tracked in the QDR have been reorganized around these priorities, and a chartbook will be released marking progress for each NQS priority. Patient safety is one of these NQS priorities and the topic of this chartbook.

## Key Findings of the 2014 QDR

The report demonstrates that the Nation has made clear progress in improving the health care delivery system to achieve the three aims of better care, smarter spending, and healthier people, but there is still more work to do, specifically to address disparities in care.


- Access improved.
  - After years without improvement, the rate of uninsurance among adults ages 18-64 decreased substantially during the first half of 2014.
  - Through 2012, improvement was observed across a broad spectrum of access measures among children.
- Quality improved for most NQS priorities.
  - *Patient Safety* improved, led by a 17% reduction in rates of hospital-acquired conditions between 2010 and 2013, with 1.3 million fewer harms to patients, an estimated 50,000 lives saved, and \$12 billion in cost savings.
  - *Person-Centered Care* improved, with large gains in provider-patient communication.
  - Many *Effective Treatment* measures, including several measures of pneumonia care in hospitals publicly reported by the Centers for Medicare & Medicaid Services (CMS), achieved such high levels of performance that continued reporting is unnecessary.
  - *Healthy Living* improved, led by doubling of selected adolescent immunization rates from 2008 to 2012.
- Few disparities were eliminated.
  - People in poor households generally experienced less access and poorer quality.
  - Parallel gains in access and quality across groups led to persistence of most disparities.
  - At the same time, several racial and ethnic disparities in rates of childhood immunization and rates of adverse events associated with procedures were eliminated, showing that elimination is possible.
- Many challenges in improving quality and reducing disparities remain.
  - Performance on many measures of quality remains far from optimal. For example, only half of people with high blood pressure have it controlled. On average, across a broad range of measures, recommended care is delivered only 70% of the time.
  - As noted above, disparities in quality and outcomes by income and race and ethnicity are large and persistent, and were not, through 2012, improving substantially.
  - Some disparities related to hospice care and chronic disease management grew larger.
  - Data and measures need to be improved to provide more complete assessments of two NQS priorities, *Care Coordination* and *Care Affordability*, and of disparities among smaller groups, such as Native Hawaiians, people of multiple races, and people who are lesbian, gay, bisexual, or transgender.

## Chartbooks Organized Around Priorities of the National Quality Strategy

1. **Making care safer by reducing harm caused in the delivery of care.**
2. Ensuring that each person and family is engaged as partners in their care.
3. Promoting effective communication and coordination of care.
4. Promoting the most effective prevention and treatment practices for the leading causes of mortality, starting with cardiovascular disease.
5. Working with communities to promote wide use of best practices to enable healthy living.
6. Making quality care more affordable for individuals, families, employers, and governments by developing and spreading new health care delivery models.

Patient Safety is one of the six national priorities identified by the National Quality Strategy (<http://www.ahrq.gov/workingforquality/index.html>).



### National Quality Strategy Priority 1



**Priority 1: Making care safer by reducing harm caused in the delivery of care**

**LONG-TERM GOALS**

1. Reduce preventable hospital admissions and readmissions.
2. Reduce the incidence of adverse health care-associated conditions.
3. Reduce harm from inappropriate or unnecessary care.

The National Quality Strategy has identified three long-term goals related to patient safety: reduce preventable hospital admissions and readmissions, reduce the incidence of adverse health care-associated conditions, and reduce harm from inappropriate or unnecessary care.

This chartbook focuses on adverse health care-associated conditions and harm from care. Preventable admissions and readmissions can result from problems with patient safety or problems with care coordination. We have chosen to include measures of preventable admissions and readmissions in the Care Coordination chartbook.



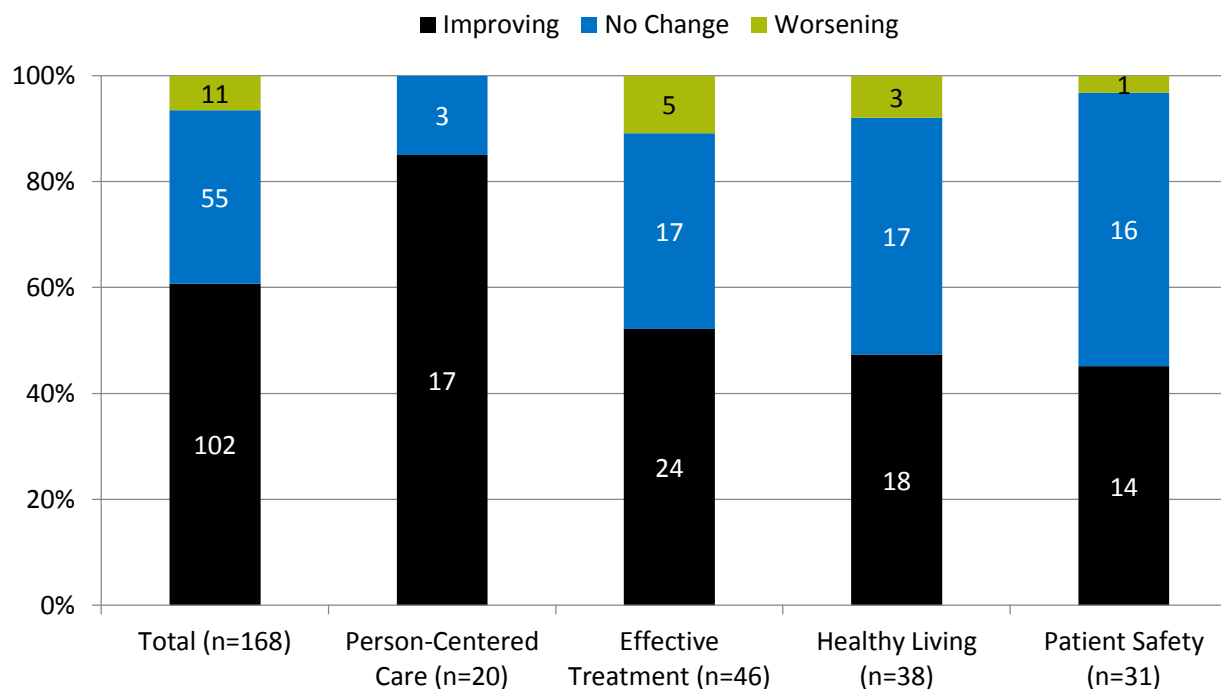
## Chartbook on Patient Safety

- This chartbook includes:
  - Summary of trends across measures of Patient Safety from the QDR
  - Figures illustrating select measures of Patient Safety
- Introduction and Methods contains information about methods used in the chartbook.
- Appendixes include information about measures and data.
- A Data Query tool (<http://nhqrnet.ahrq.gov/inhqrdr/data/query>) provides access to all data tables.



## Summary of Trends Across National Quality Strategy Priorities

Number and percentage of all quality measures that are improving, not changing, or worsening through 2012, overall and by NQS priority

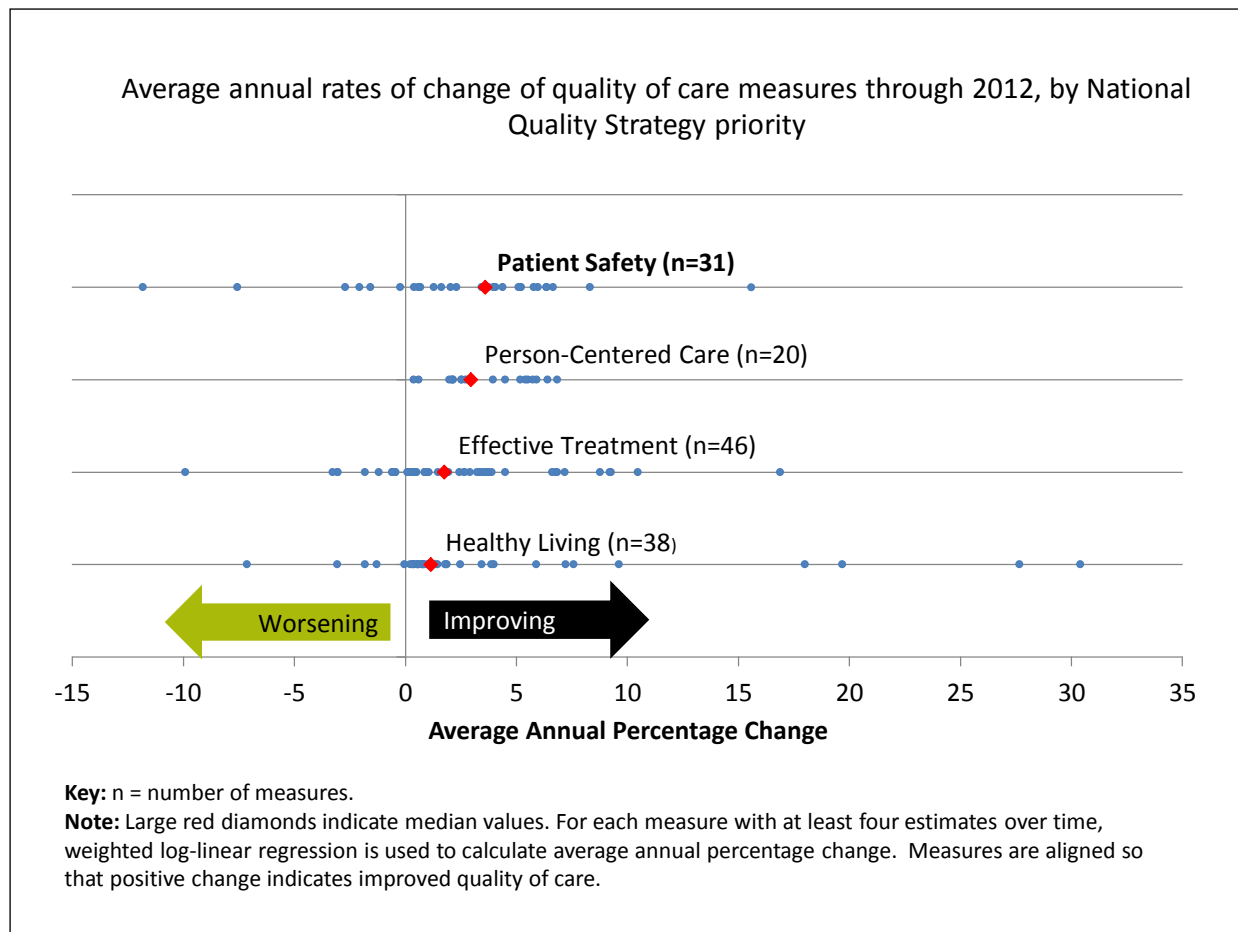


**Key:** n = number of measures.

**Note:** For most measures, trend data are available from 2001-2002 to 2012. For each measure with at least four estimates over time, weighted log-linear regression is used to calculate average annual percentage change and to assess statistical significance. Measures are aligned so that positive change indicates improved access to care.

- **Improving** = Rates of change are positive at 1% per year or greater and statistically significant.
- **No Change** = Rate of change is less than 1% per year or not statistically significant.
- **Worsening** = Rates of change are negative at -1% per year or greater and statistically significant.
- Nearly half of Patient Safety measures improved compared with 60% of all quality measures.

## Summary of Trends Across National Quality Strategy Priorities

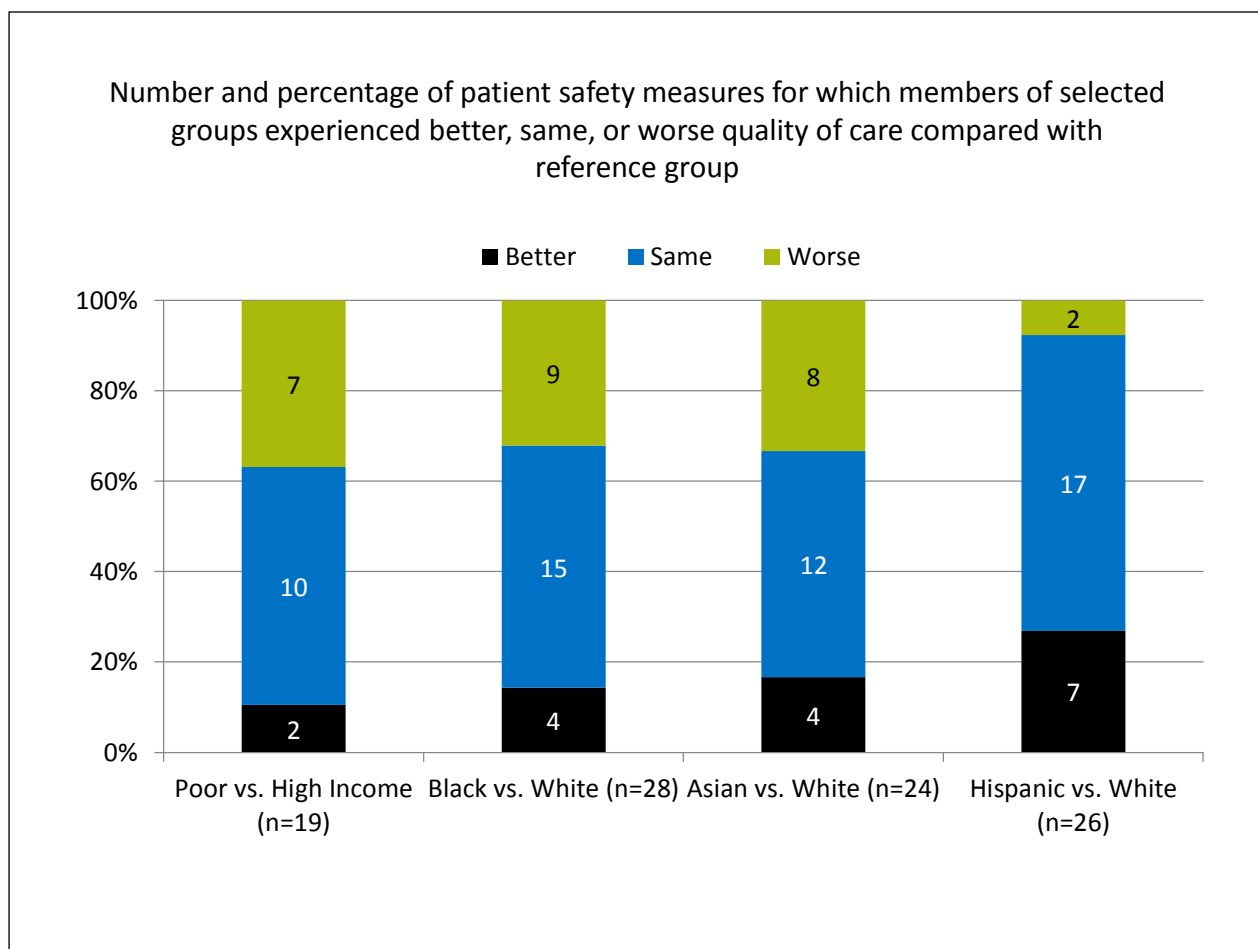


- Median change in quality was 3.6% per year among measures of Patient Safety.

## Patient Safety Measures That Improved Quickly or Showed Worsening Quality

- One Patient Safety measure improved quickly, defined as an average annual rate of change greater than 10%:
  - Central line-associated bloodstream infection per 1,000 medical and surgical discharges, age 18+ or obstetric admissions
- One Patient Safety measure showed worsening quality:
  - Postoperative physiologic and metabolic derangements per 1,000 elective-surgery discharges, age 18+

## Disparities in Patient Safety Measures



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

**Note:** Poor indicates family income less than the Federal poverty level; High Income indicates family income four times the Federal poverty level or greater. Numbers of measures differ across groups because of sample size limitations. For most measures, data from 2012 are shown.

The relative difference between a selected group and its reference group is used to assess disparities.

- **Better** = Population received better quality of care than reference group. Differences are statistically significant, are equal to or larger than 10%, and favor the selected group.
- **Same** = Population and reference group received about the same quality of care. Differences are not statistically significant or are smaller than 10%.
- **Worse** = Population received worse quality of care than reference group. Differences are statistically significant, are equal to or larger than 10%, and favor the reference group.
- For about one-third of patient safety measures:
  - People in poor households received worse care than people in high-income households.
  - Blacks and Asians received worse care than Whites.

## Patient Safety Measures With Elimination or Widening of Disparities

- Four Patient Safety measures showed elimination of Black-White disparities:
  - Mechanical adverse events in patients receiving central venous catheter placement, age 18+
  - Hospital patients with an anticoagulant-related adverse drug event to low-molecular-weight heparin and factor Xa, age 18+
  - Postoperative respiratory failure per 1,000 elective-surgery discharges, age 18+
  - Admissions with iatrogenic pneumothorax per 1,000 discharges, age 18+
- One Patient Safety measure showed widening of an Asian-White disparity:
  - Admissions with iatrogenic pneumothorax per 1,000 discharges, age 18+

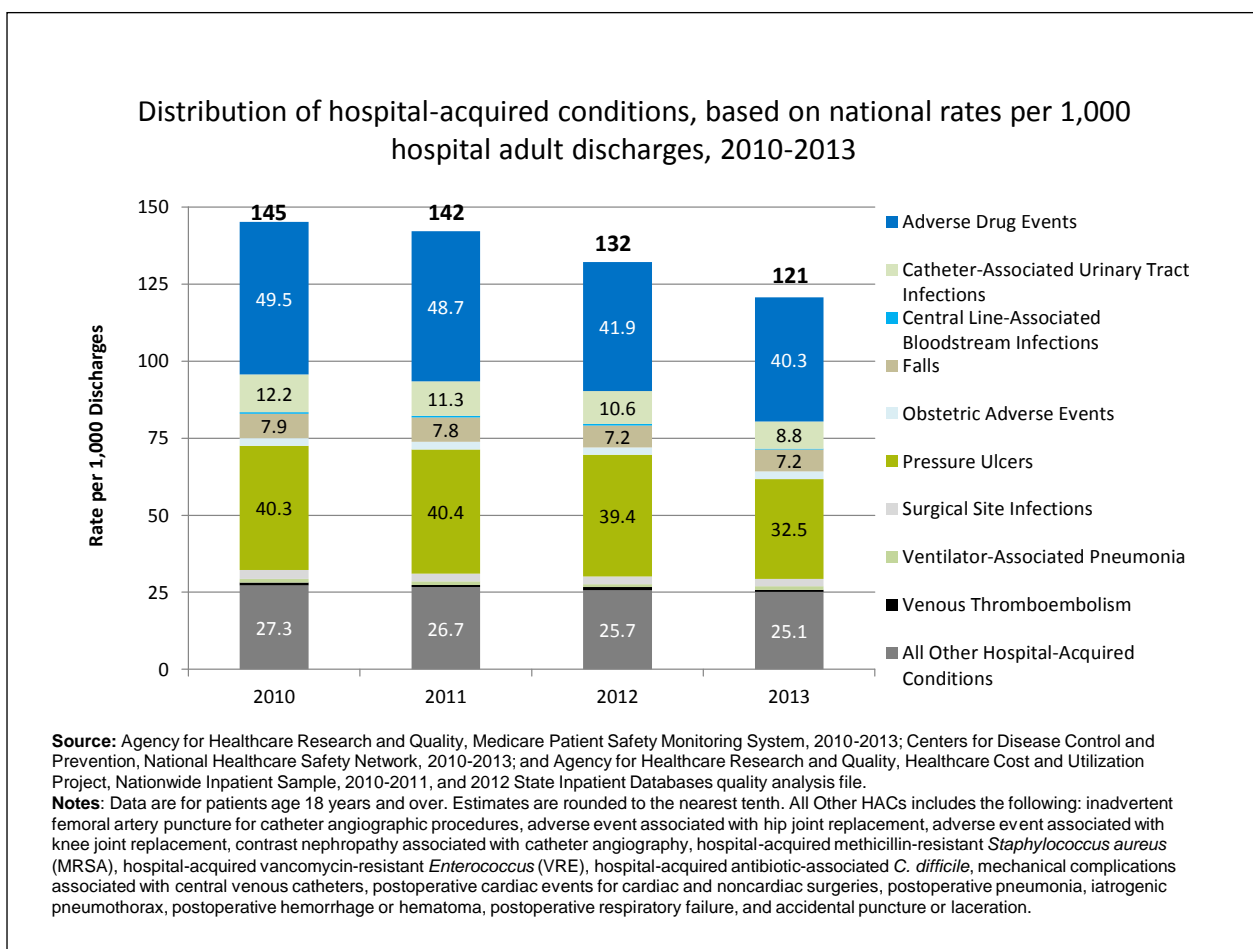
## Measures of Patient Safety

- In addition to summarizing information on patient safety from the National Healthcare Quality and Disparities Report, this chartbook tracks individual measures of patient safety, overall and for populations defined by age, race, ethnicity, income, education, insurance, and number of chronic conditions.
- Measures of Patient Safety are organized by setting and include:
  - Hospitals
  - Nursing homes
  - Home health
  - Ambulatory care
  - All settings: Infrastructure

## Measures of Patient Safety in the Hospital Setting

- Hospitals are a common setting for patient safety events:
  - Many patients admitted to the hospital are in a clinically compromised state.
  - A high volume of care transactions and interventions take place during a hospital stay.
- Measures include:
  - Overall hospital-acquired conditions (HACs)
  - Healthcare-associated infections (HAIs)
  - Procedure-related events

## Overall Hospital-Acquired Conditions



- **Importance:** Patient safety events that occur in the hospital setting are not uncommon and are known as HACs.
- **Overall Rate:** In 2013, the national overall HAC rate was 121 per 1,000 hospital discharges. Adverse drug events (40.3 per 1,000 hospital discharges) accounted for 33.3% of total HACs and pressure ulcers (32.5 per 1,000 hospital discharges) accounted for 26.9% of the total.
- **Change Over Time:** From 2010 to 2013, the overall rate of hospital-acquired conditions declined from 145 to 121 per 1,000 hospital discharges.

## **Patient Safety in the Hospital Setting: Healthcare-Associated Infections**

- Infections acquired during hospital care—also known as nosocomial infections—are among the most common complications of hospital care.
- HAIs often increase the patient’s length of stay in the hospital, risk of mortality, and hospital costs.
  - New infections in critically ill infants and children generally reduce their chances for recovery.
- Antibiotic prophylaxis may prevent or reduce some infections.
- Proper insertion and management of central lines can also lower infection rates significantly.

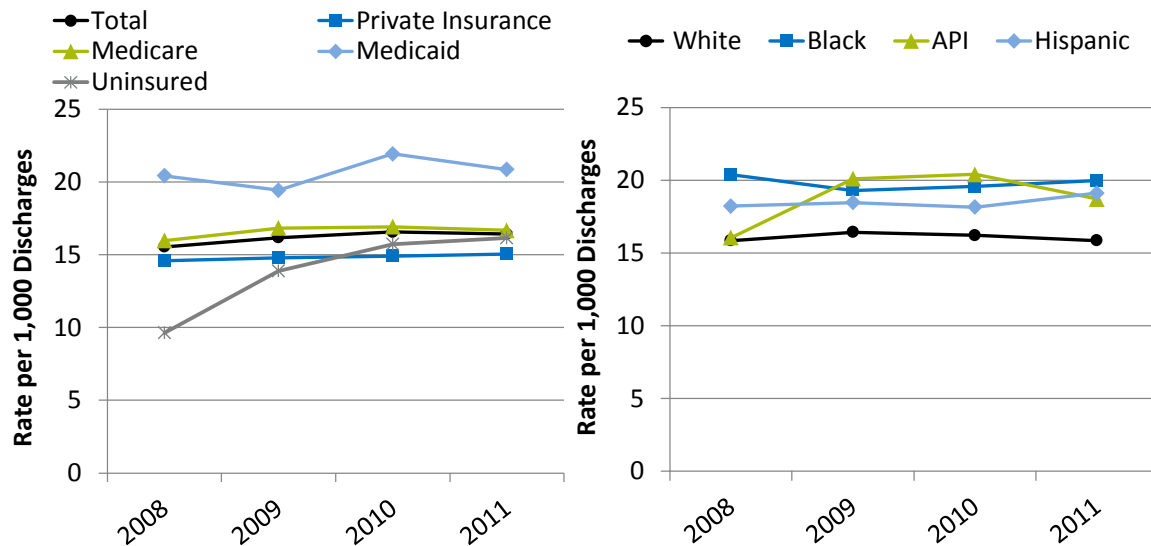
## **Measures of Patient Safety in the Hospital Setting: Healthcare-Associated Infections**

- Postoperative sepsis per 1,000 adult discharges with an elective operating room procedure
- Standardized infection ratios for central line-associated bloodstream infections and surgical site infections
- Bloodstream infections per 1,000 central-line days in neonatal intensive care units
- Bloodstream infections per 1,000 central-line days in adult intensive care units



## Postoperative Sepsis

Postoperative sepsis per 1,000 adult discharges with an elective operating room procedure, by insurance status and patient race/ethnicity, 2008-2011



**Key:** API = Asian or Pacific Islander.

**Source:** Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2008-2011, and AHRQ Quality Indicators, modified version 4.1.

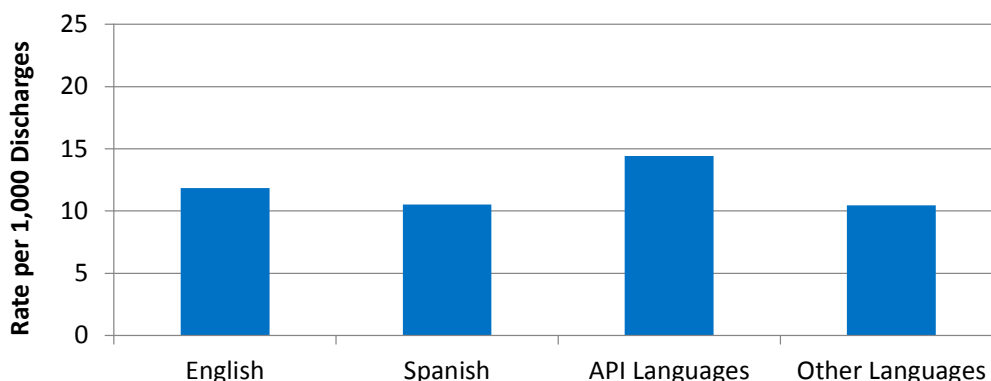
**Denominator:** All elective hospital surgical discharges for patients age 18 years and over with length of stay of 4 or more days, excluding patients admitted for infection, those with cancer or immunocompromised states, those with obstetric conditions, and admissions specifically for sepsis.

**Note:** Acute care hospitalizations only. For this measure, lower rates are better. Rates are adjusted by age, sex, age-sex interactions, comorbidities, major diagnostic category (MDC), diagnosis-related group (DRG), and transfers into the hospital. White, Black, and API are non-Hispanic. Hispanic includes all races.

- **Overall Rate:** In 2011, the postoperative sepsis rate was 16.4 per 1,000 adult discharges with an elective operating room procedure.
- **Change Over Time:** From 2008 through 2011, the rate of postoperative sepsis did not change overall or for any insurance or racial/ethnic group.
- **Groups With Disparities:** In 2011, Medicaid and Medicare patients had higher rates of postoperative sepsis compared with those who were privately insured. Asian and Pacific Islander patients, Hispanic patients, and Black patients had higher rates of postoperative sepsis than their White counterparts.

## Postoperative Sepsis in California

Postoperative sepsis per 1,000 adult discharges with an elective operating room procedure, by patient language, California, 2009-2011 (combined)



**Key:** API = Asian and Pacific Islander; languages include Chinese, Hindi, Japanese, Korean, Tagalog, Thai, Vietnamese, Lao, Mandarin, Cantonese, Hmong, Ilocano, Iu Mien, Indonesian, Mon-Khmer, Tonga, Urdu, Burmese, Telugu, Bengali, Tamil, Gujarati, Panjabi, Malayalam, Marathi, Kannada, Chamorro, Fijian, Filipino, Central Khmer, Mongolian, Nepali, Sinhala, and Samoan.

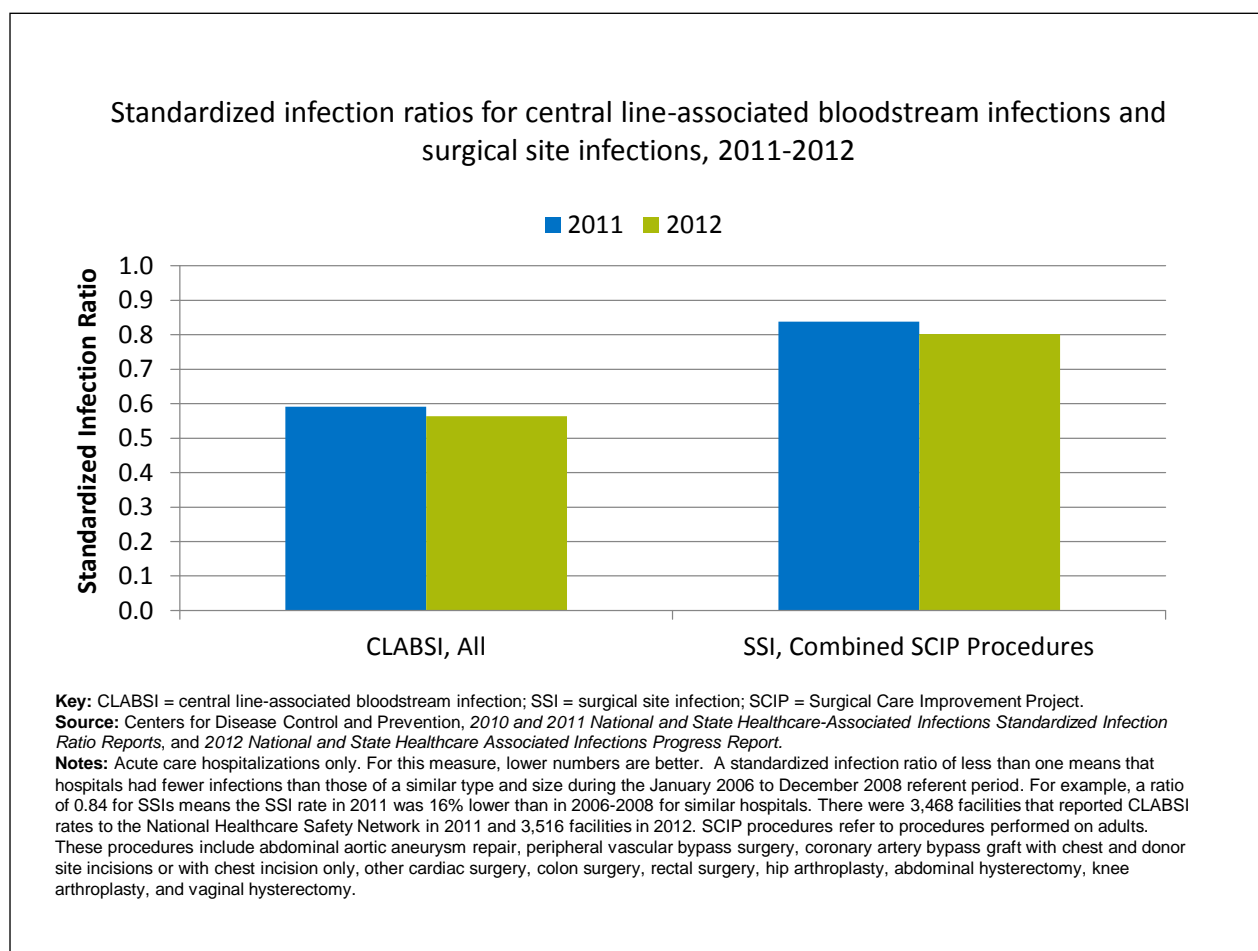
**Source:** Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project, State Inpatient Databases, California, 2009-2011, and AHRQ Quality Indicators, version 4.5 with the use of indication of diagnoses being present on admission and day of procedure.

**Denominator:** All elective hospital surgical discharges for patients age 18 years and over with length of stay of 4 or more days, excluding patients admitted for infection, those with cancer or immunocompromised states, those with obstetric conditions, and admissions specifically for sepsis.

**Note:** Acute care hospitalizations only. For this measure, lower rates are better. Rates are adjusted by age, sex, age-sex interactions, comorbidities, major diagnostic category (MDC), diagnosis-related group (DRG), and transfers into the hospital.

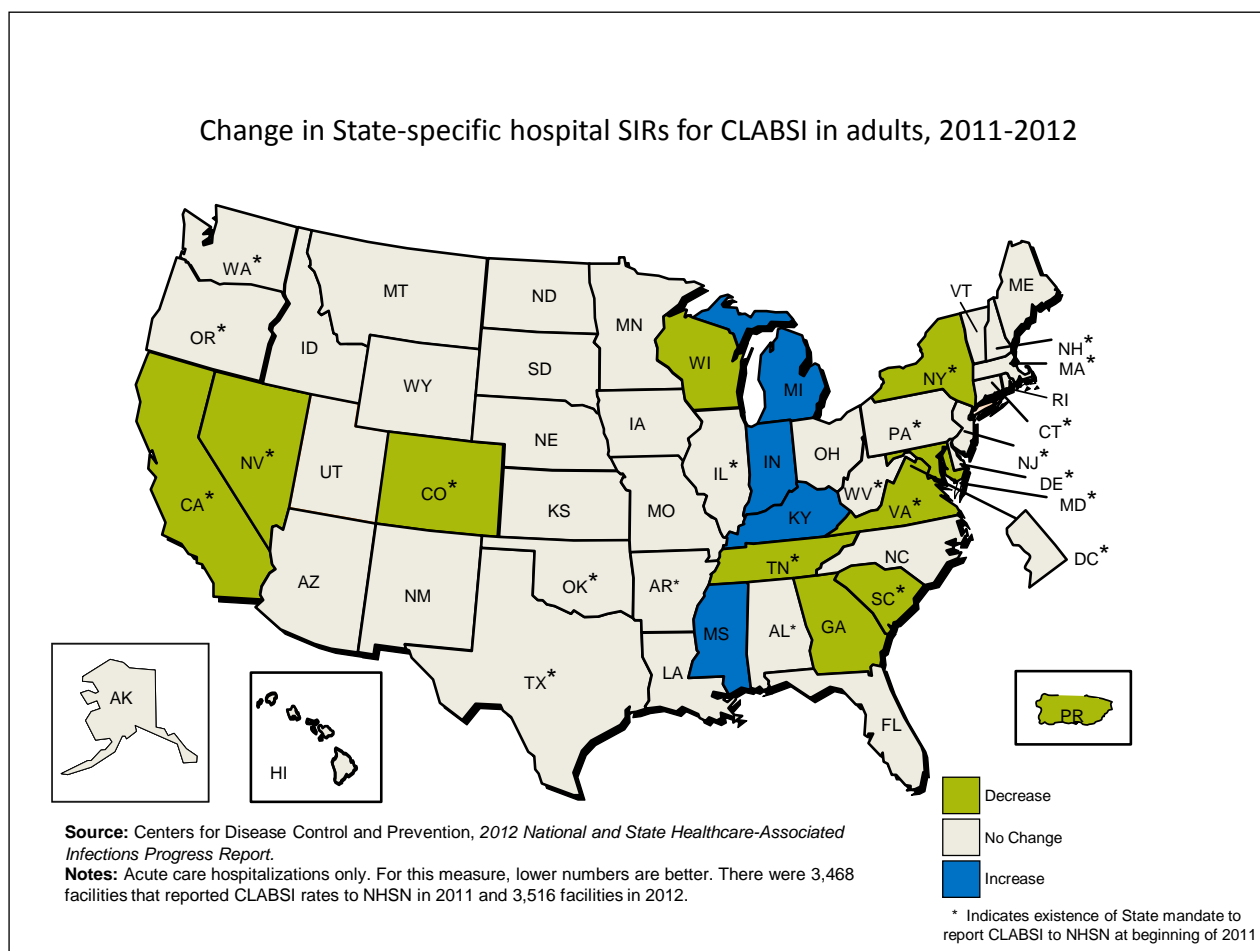
- **Groups With Disparities:** From January 2009 through December 2011, there were no statistically significant differences in rates of postoperative sepsis in California by language spoken.

## Standardized Infection Ratios



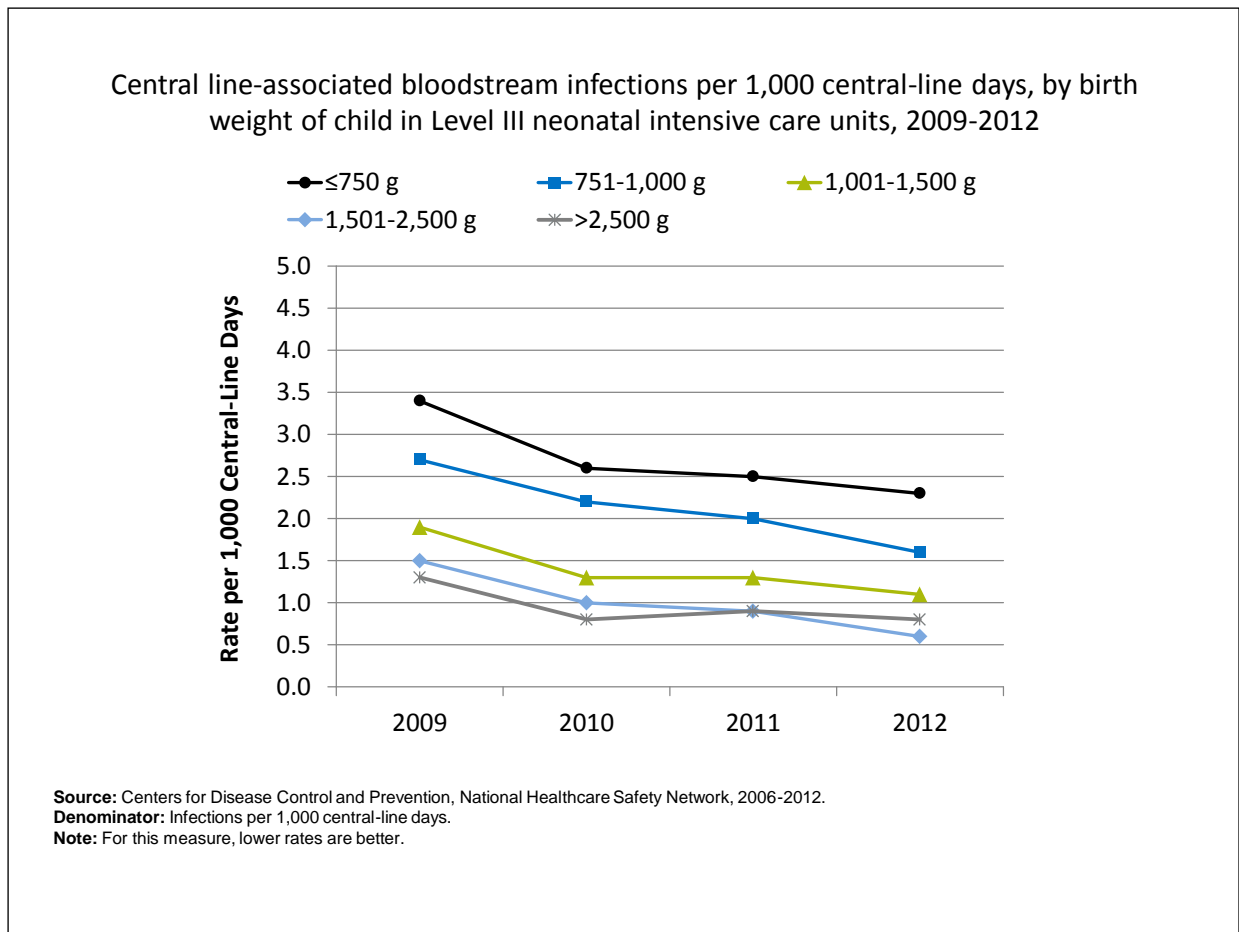
- **Overall Rate:** In 2012, the overall central line-associated bloodstream infection (CLABSI) standardized infection ratio (SIR) among intensive care units in the 50 States, District of Columbia, and Puerto Rico was 0.56 and the national SIR for surgical site infections (SSIs) following 10 procedures was 0.80.
- **Change Over Time:** From 2011 to 2012, both CLABSIs and SSIs decreased by about 4% among facilities reporting to the National Healthcare Safety Network (NHSN) in both years.

## Change in Standardized Infection Ratios



- **Geographic Variation:** In 2012, two jurisdictions—Alaska and Puerto Rico—had SIRs greater than one, indicating more CLABSIs than hospitals of similar type and size during the referent period (January 2006 to December 2008).
- **Change Over Time:**
  - Of 52 reporting jurisdictions from 2011 to 2012, 37 had no change in CLABSI SIRs, 11 jurisdictions decreased, and 4 States increased.
  - States that reported a CLABSI SIR decrease from 2011 to 2012 were more likely than the group of States that did not change or that experienced a CLABSI rate increase to have a State mandate at the beginning of 2012 to report CLABSI rates to the NHSN.

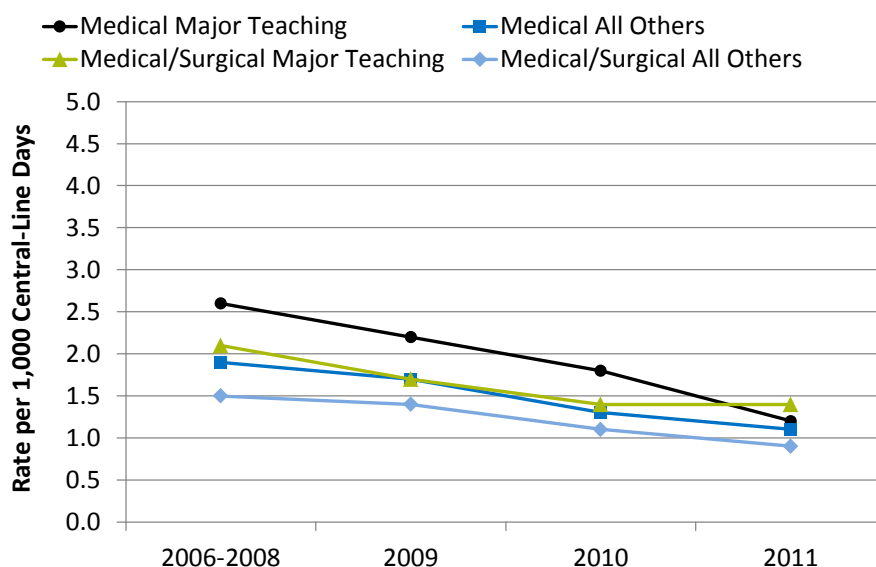
## Bloodstream Infections in Neonatal Intensive Care Units



- Groups With Disparities:** In 2012, among patients in the Level III NICU, pooled mean CLABSI rates ranged from a low of 0.6 infections per 1,000 central-line days among neonates born at 1,501 to 2,500 grams to a high of 2.3 infections per 1,000 central-line days among neonates born at less than or equal to 750 grams.

## Bloodstream Infections in Adult Intensive Care Units

Central line-associated bloodstream infections per 1,000 central-line days in adult medical vs. medical/surgical intensive care units, by hospital teaching status, 2006-2011



**Source:** Centers for Disease Control and Prevention, National Healthcare Safety Network, 2006–2012.

**Denominator:** Infections per 1,000 central-line days.

**Note:** Acute care hospitalizations only. For this measure, lower rates are better. Three types of teaching hospitals are defined in the NHSN: major facilities with programs for medical students and postgraduate training, graduate facilities with programs for postgraduate medical training, and undergraduate facilities with programs for medical students only.

- Change Over Time:** From 2006-2008 (combined) to 2011, rates of CLABSIs in hospitals decreased 54% among adult medical ICU patients in hospitals with major teaching programs, 33% among adult medical/surgical ICU patients in hospitals with major teaching programs, 42% among adult medical ICU patients in all other (non-major teaching) hospitals, and 40% among adult medical/surgical ICU patients in all other (non-major teaching) hospitals.

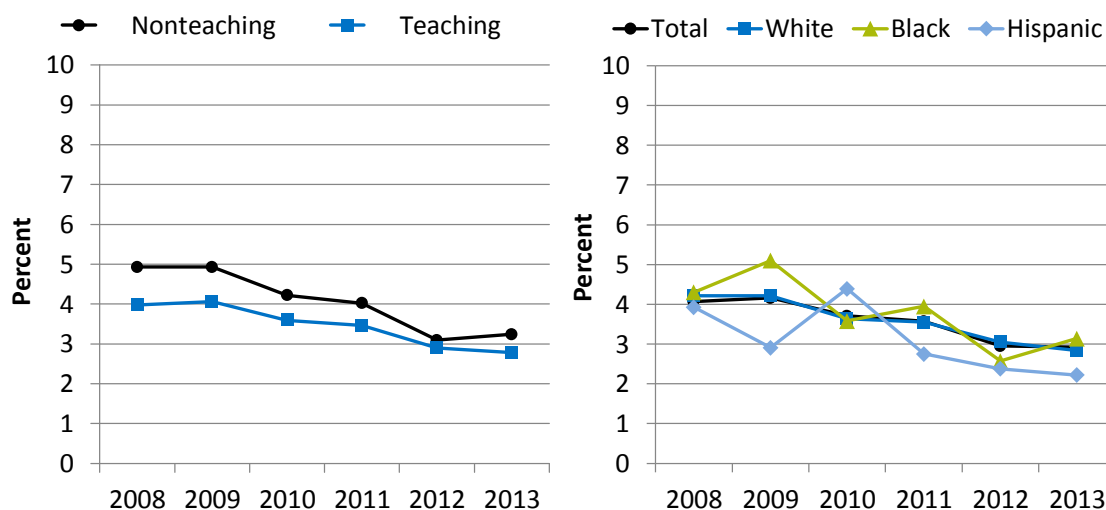
### **Measures of Patient Safety in the Hospital Setting: Procedure-Related Events**

- Unadjusted mortality rate (%) 30 days postoperation for colorectal surgeries among U.S. hospitals participating in the American College of Surgeons (ACS)-National Surgical Quality Improvement Program (NSQIP)
- Percentage of adult patients receiving hip joint replacement because of fracture or degenerative conditions who experienced adverse events
- Percentage of adults with mechanical adverse events associated with central venous catheter placement



## Mortality After Colorectal Surgery

Unadjusted mortality rate (%) 30 days postoperation for colorectal surgeries among ACS-NSQIP participating hospitals in the United States, by hospital teaching status and race/ethnicity, 2008-2013



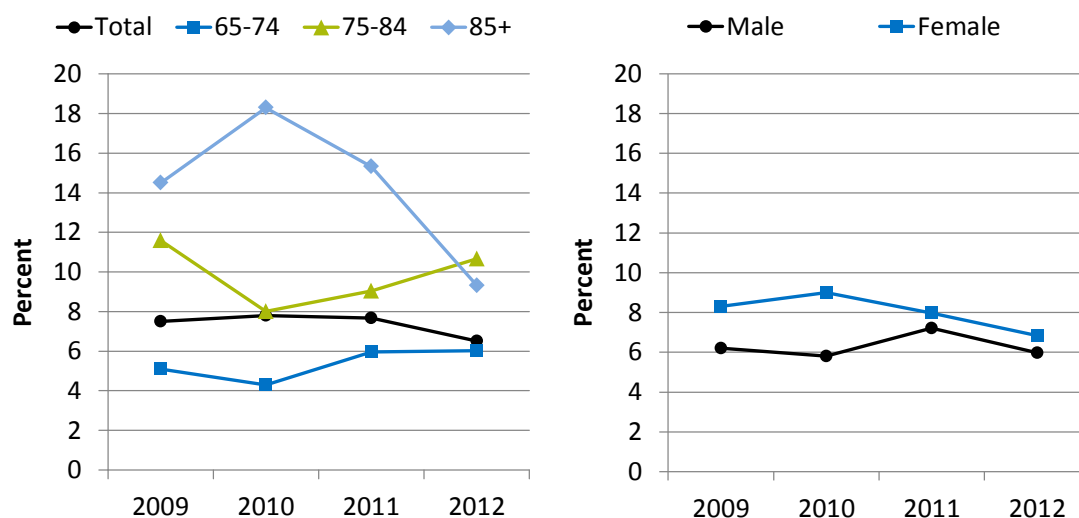
Source: American College of Surgeons (ACS), National Surgical Quality Improvement Program (NSQIP), 2008-2013.

Note: For this measure, lower rates are better. These data may not represent U.S. hospitals, as participation in ACS NSQIP is voluntary and current participation is weighted when calculating rates; participating hospitals have changed over the 2008-2013 time interval (i.e., some hospitals have dropped out and others have enrolled); and 32% more hospitals participated in 2013 than 2008. Some portion of the variation in raw mortality rate observed over time may be due to these sampling issues. White and Black are non-Hispanic. Hispanic includes all races.

- **Importance:** Colon and rectal procedures are ranked among the most harmful procedures, with high rates of postoperative complications, which are often a result of nonadherence to best practices.
- **Overall Rate:** In 2013, the unadjusted rate of 30-day postoperative mortality for colorectal surgeries was 2.9% among ACS-NSQIP participating hospitals in the United States.
- **Change Over Time:**
  - From 2008 to 2013, unadjusted rates of 30-day postoperative mortality for colorectal surgery decreased by 34% among nonteaching hospitals and by 30% among teaching hospitals.
  - Rates decreased by 44% among Hispanics, 27% among Blacks, and 33% among Whites.
- **Groups With Disparities:**
  - Unadjusted rates of 30-day postoperative mortality for colorectal surgery patients were higher in nonteaching hospitals than teaching hospitals across all years except 2012.
  - In 2013, Blacks had higher rates and Hispanics had lower rates compared with Whites.

## Adverse Events After Hip Joint Replacement

Adult patients receiving hip joint replacement because of fracture or degenerative conditions who experienced adverse events, by age and sex, 2009-2012



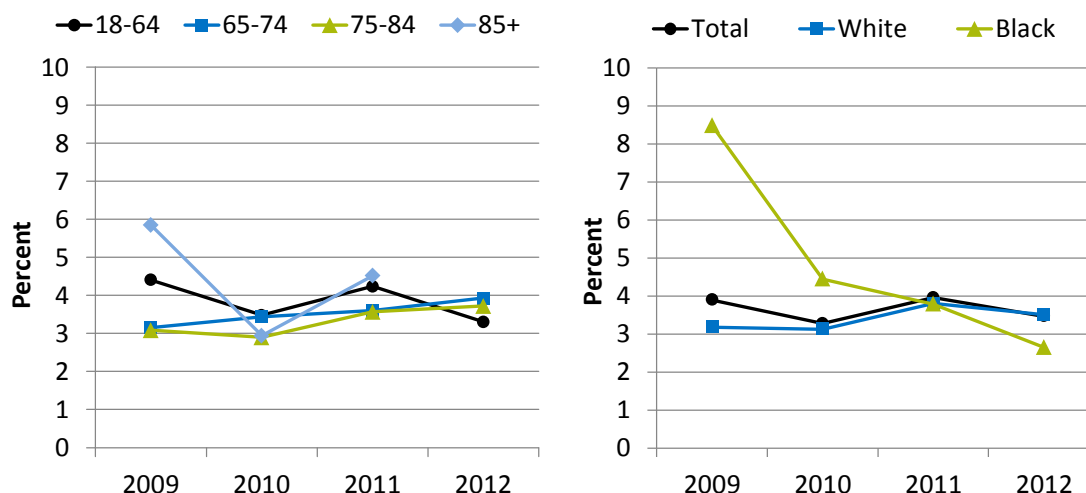
**Source:** Agency for Healthcare Research and Quality and Centers for Medicare & Medicaid Services (CMS), Medicare Patient Safety Monitoring System (MPSMS), 2009–2012.

**Note:** For this measure, lower rates are better. The 2012 MPSMS data sample drawn from the CMS Inpatient Quality Reporting Program included medical records from hospitals throughout the United States that reported on at least one of four conditions (acute myocardial infarction, heart failure, pneumonia, and Surgical Care Improvement Project). Hospitals in Puerto Rico, the Virgin Islands, and Maryland were not included in the sample.

- **Importance:** Hip replacement is most common among older adults, who have an increased risk of adverse events after these surgeries.
- **Overall Rate:** In 2012, 6.5% of adult patients receiving hip joint replacement because of fracture or degenerative conditions experienced adverse events.
- **Change Over Time:**
  - From 2009 to 2012, the percentage of adverse events among patients ages 65-74 years who had a hip replacement increased from 5.1% to 6.0% .
  - The percentage decreased among women from 8.3% to 6.8%.
- **Groups With Disparities:**
  - In 2009, 2010, and 2011, a higher percentage of patients age 85 years and over who received a hip joint replacement experienced an adverse event compared with those ages 65-74 years.
  - In 2012, a higher percentage of patients ages 75-84 years who received a hip joint replacement experienced an adverse event compared with those ages 65-74 years.

## Mechanical Adverse Events After Central Venous Catheter Placement

Adults with mechanical adverse events associated with central venous catheter placement, by age and race, 2009-2012



**Source:** Agency for Healthcare Research and Quality and Centers for Medicare & Medicaid Services, Medicare Patient Safety Monitoring System, 2009-2012.

**Denominator:** Selected discharges of hospitalized patients age 18 years and over with central venous catheter placement.

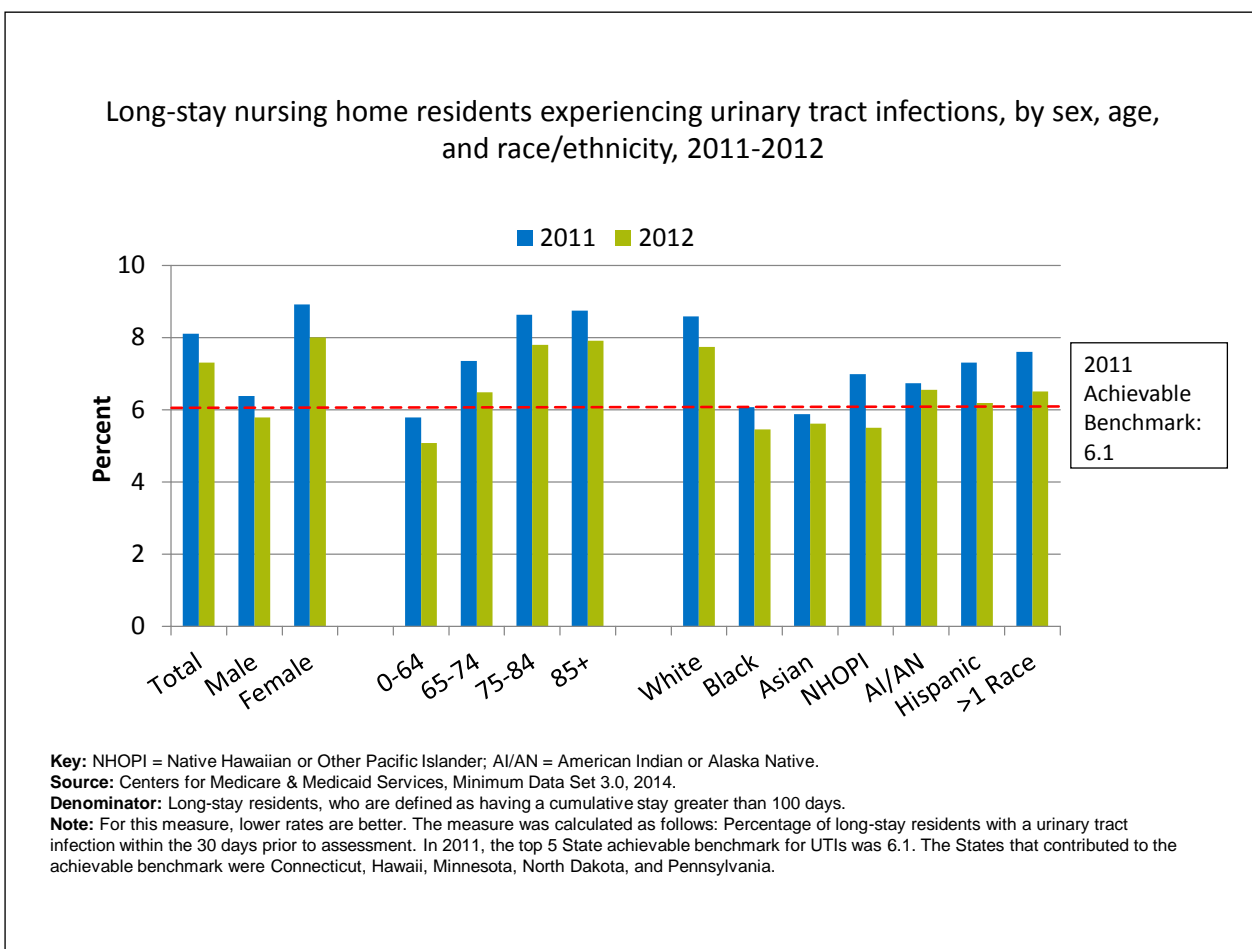
**Note:** For this measure, lower rates are better. Mechanical adverse events include allergic reaction to the catheter, tamponade, perforation, pneumothorax, hematoma, shearing off of the catheter, air embolism, misplaced catheter, thrombosis of embolism, knotting of the pulmonary artery catheter, and certain other events. White and Black are non-Hispanic. Data for age 85+ for 2012 did not meet the criteria for statistical reliability.

- **Importance:** The placement and use of central venous catheters can result in mechanical adverse events, including bleeding, hematoma, perforation, pneumothorax, air embolism, and misplacement, occlusion, shearing, or knotting of the catheter.
- **Overall Rate:** In 2012, 3.5% of adults with central venous catheter placements experienced an associated mechanical adverse event.
- **Change Over Time:** From 2009 to 2012, the percentage of adults with central venous catheter placements who had a mechanical adverse event increased for patients ages 65-74 years (from 3.2% to 3.9%) and for patients ages 75-84 years (from 3.1% to 3.7%).
- **Groups With Disparities:**
  - From 2009 to 2012, the percentage of Black adults with central venous catheter placements who had a mechanical adverse event decreased to 2.7% from 8.5%.
  - The percentage of White adults who had a mechanical adverse event remained between 3% and 4% during this time.

## **Patient Safety in the Nursing Home Setting**

- More than 3 million people receive care in U.S. nursing homes and skilled nursing facilities each year (CDC).
- For nursing home residents, optimal care seeks to maximize quality of life and minimize unintended complications.
- Measures include:
  - Nursing home residents experiencing urinary tract infections
  - Nursing home residents experiencing use of restraints
  - Pooled mean rate of healthcare-associated infections per 1,000 resident days in Pennsylvania nursing homes

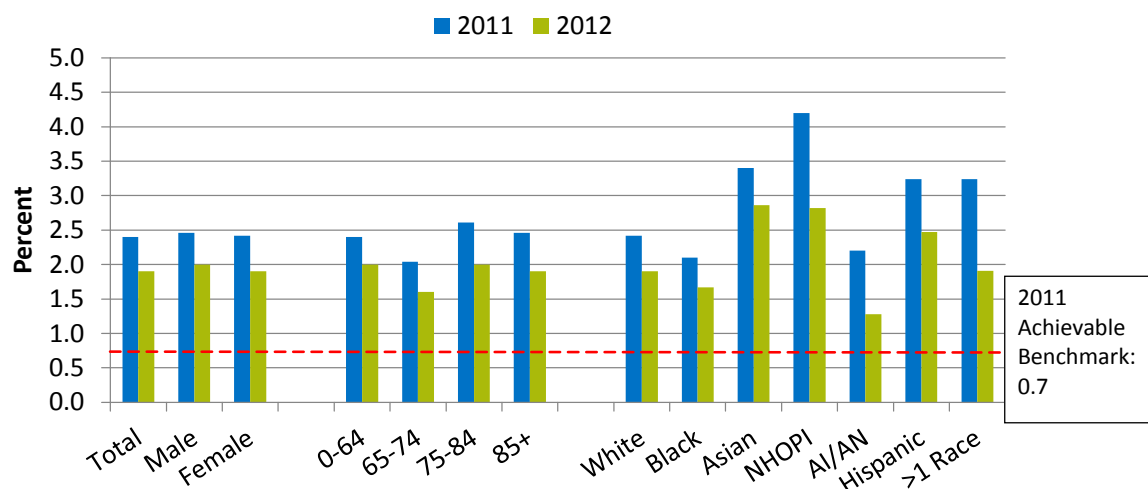
## Nursing Home Residents With Urinary Tract Infections



- **Importance:** Urinary tract infections (UTIs) can spread and become more serious or cause further complications, such as delirium.
- **Overall Rate:** In 2012, the percentage of long-stay nursing home residents with a UTI was 7.3%.
- **Groups With Disparities:**
  - In 2011 and 2012, higher percentages of long-stay residents age 65 and over had UTIs compared with those under 65. A higher percentage of female long-stay residents had UTIs compared with their male counterparts in both years.
  - In 2012, compared with White residents, other racial and ethnic groups had lower rates of UTIs.
- **Achievable Benchmark:** Residents under age 65, males, and Blacks, Asians, and Native Hawaiians and Other Pacific Islanders achieved the benchmark.

## Nursing Home Residents in Restraints

Long-stay nursing home residents experiencing use of restraints, by sex, age, and race/ethnicity, 2011-2012



**Key:** NHOPI = Native Hawaiian or Other Pacific Islander; AI/AN = American Indian or Alaska Native.

**Source:** Centers for Medicare & Medicaid Services, Minimum Data Set 3.0, 2014.

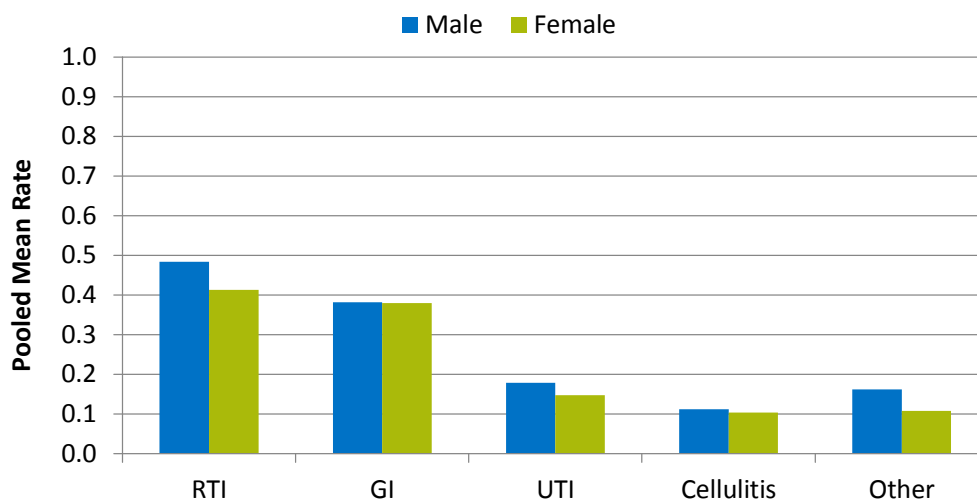
**Denominator:** Long-stay residents, who are defined as having a cumulative stay greater than 100 days.

**Note:** For this measure, lower rates are better. The measure was calculated as follows: Percentage of long-stay residents who are physically restrained on a daily basis. In 2011, the top 5 State achievable benchmark for restraint use was 0.7 percent. The States that contributed to the achievable benchmark were Kansas, Maine, Nebraska, New Hampshire, and Vermont.

- **Importance:** Residents who are restrained daily can become weak, lose their ability to go to the bathroom by themselves, and develop pressure ulcers or other medical conditions.
- **Overall Rate:** In 2012, the percentage of long-stay nursing home residents who were physically restrained on a daily basis was 1.9%.
- **Groups With Disparities:**
  - In 2011 and 2012, a lower percentage of residents ages 65-74 years were held in restraints on a daily basis compared with residents younger than 65 years.
  - In 2012, compared with Whites, Asians, Native Hawaiians and Other Pacific Islanders, and Hispanics had higher rates of daily restraint use; Blacks and American Indians and Alaska Natives had lower rates of daily restraint use compared with Whites.
- **Achievable Benchmark:** No group has achieved the benchmark

## Healthcare-Associated Infections in Nursing Homes

Pooled mean rate of healthcare-associated infections per 1,000 resident days in Pennsylvania nursing homes, by gender, 2010-2013 (combined)



**Key:** RTI = respiratory tract infection, including pneumonia and influenza-like illness; GI = gastrointestinal infection, including *Clostridium difficile* and norovirus; UTI = urinary tract infection in resident without indwelling urinary catheter; Cellulitis = skin and soft tissue infection; Other = intra-abdominal infection, meningitis, viral hepatitis, osteomyelitis, and primary bloodstream infection.

**Source:** Pennsylvania Patient Safety Authority data, 2010-2013.

**Note:** For this measure, lower rates are better. Rate calculation = (number of infections divided by number of resident days) x 1,000. Factors affecting infection rates include the prevalence of underlying risk factors as well as awareness and surveillance efforts.

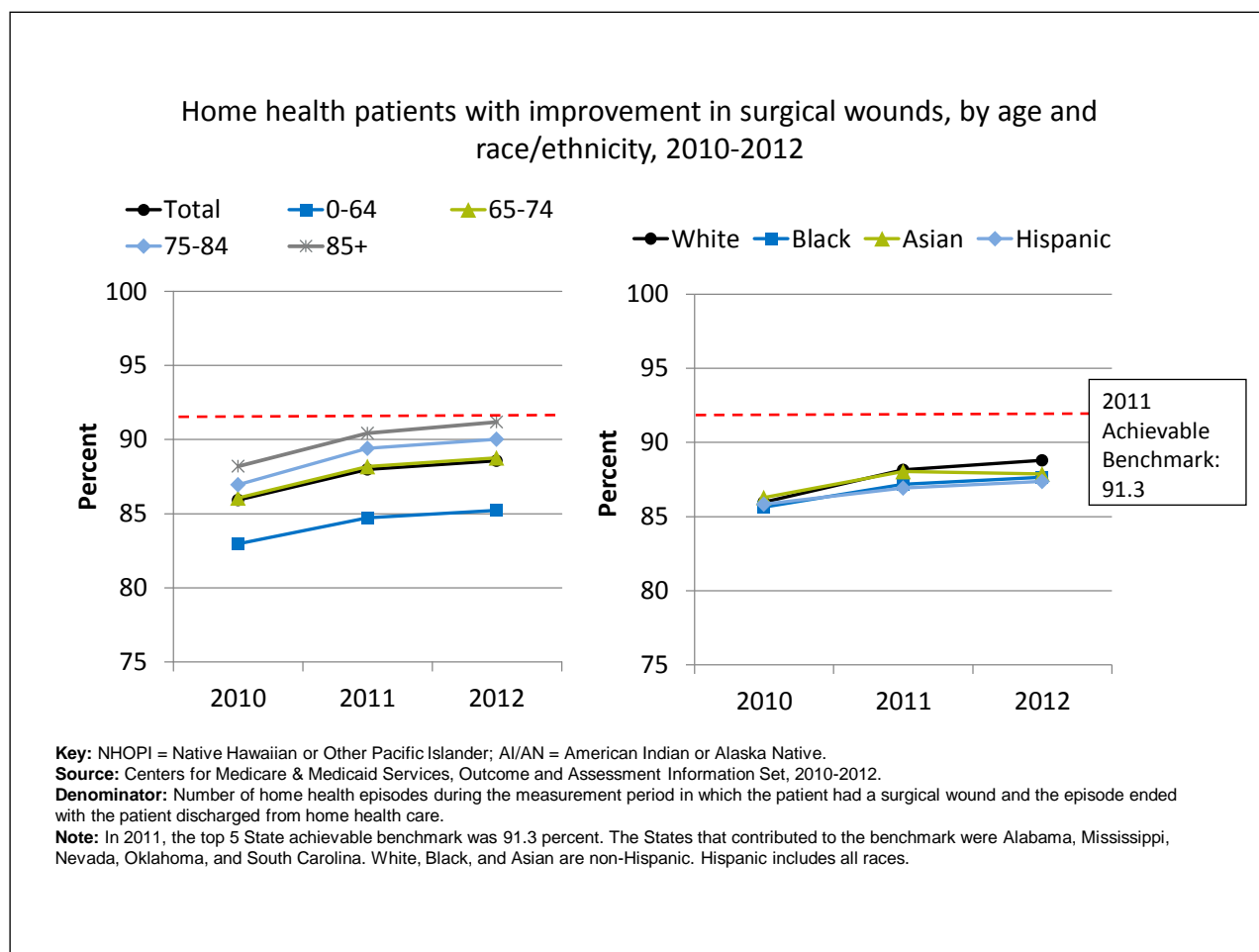
- **Importance:** Infections are a major cause of harm in nursing homes. Respiratory tract, gastrointestinal, urinary tract, and skin and soft tissue infections are the most common conditions in this care setting.
- **Groups With Disparities:** Pooled mean rates of infection among Pennsylvania nursing home residents were higher among men than women for RTI, UTI, and other infections.



## **Patient Safety in the Home Health Setting**

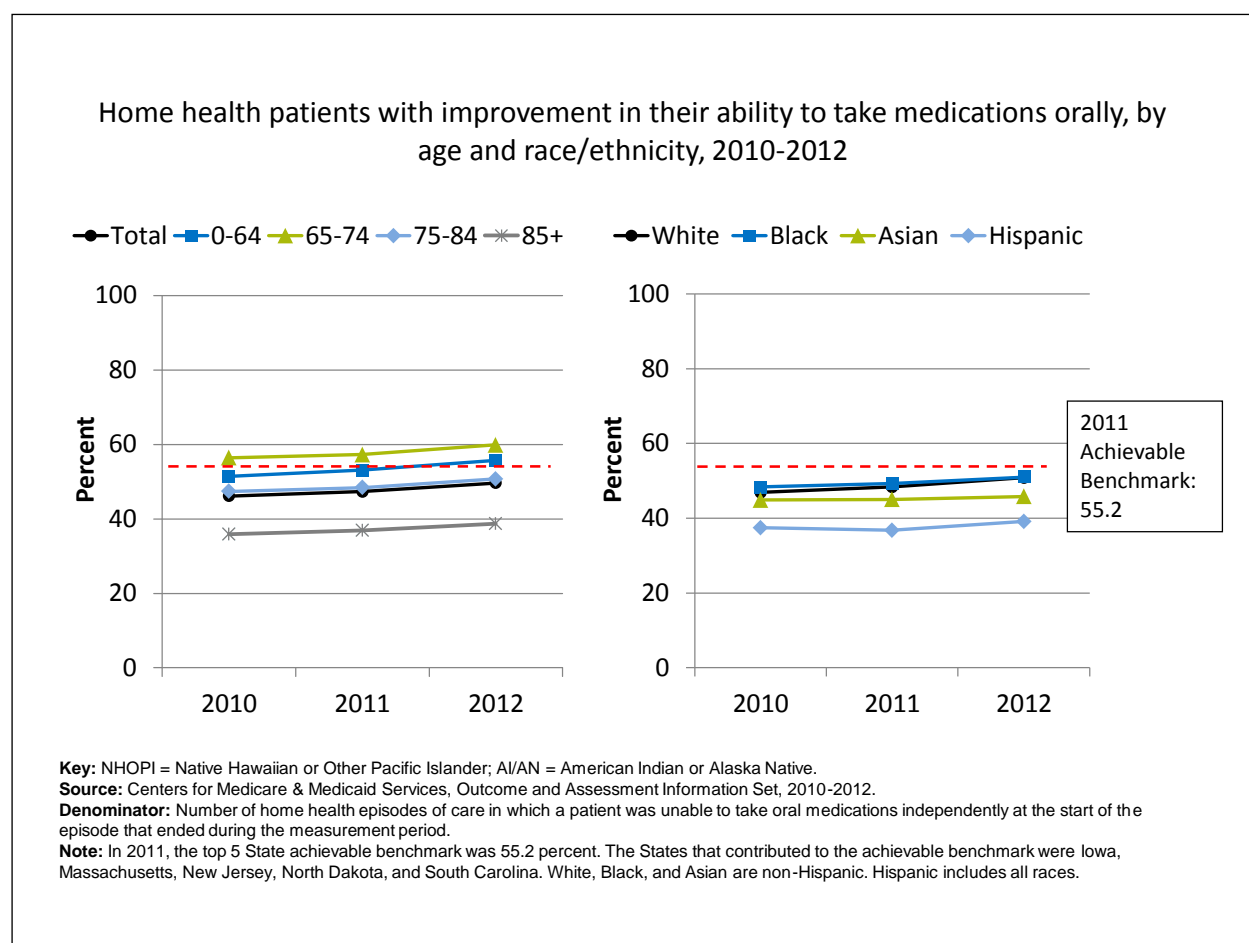
- Home health care is the fastest growing sector in the health care industry, with 66 percent growth projected over the next 10 years (Gershon, et al.).
- Improvements among home health patients can reflect the quality of care from home health agencies.
- Measures include:
  - Home health patients with improvement in surgical wounds
  - Home health patients with improvements in their ability to take medications orally

## Home Health Patients With Surgical Wounds

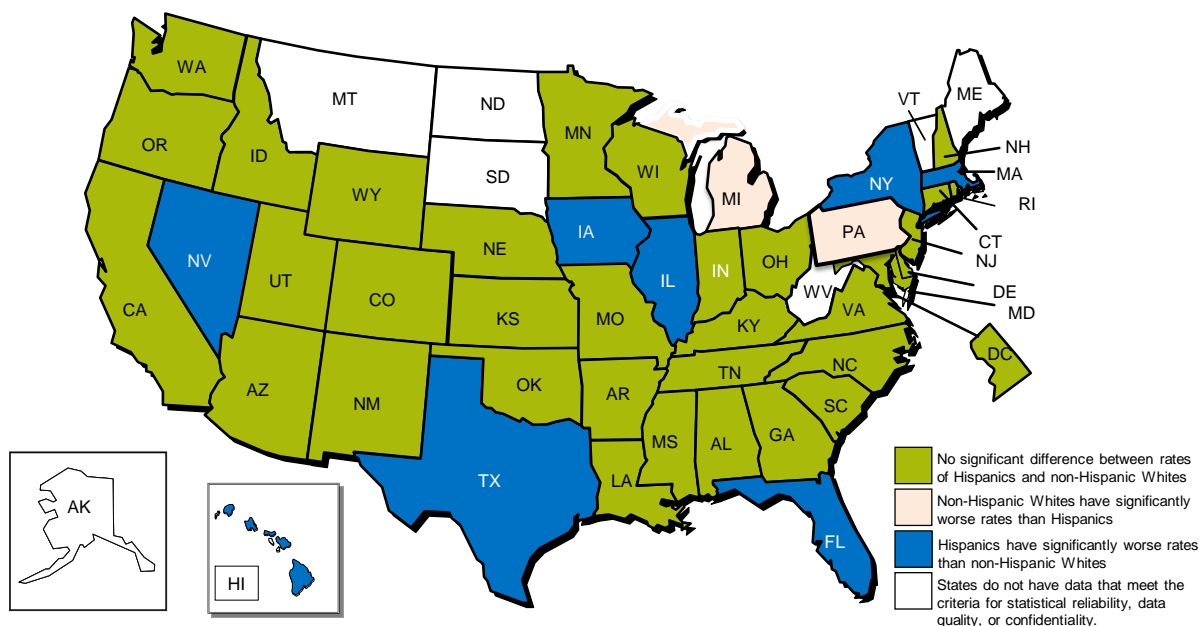


- **Importance:** Normal wound healing after an operation is an important marker of good care. The home health team should regularly change wound dressing and teach the patient about wound care.
- **Overall Rate:** In 2012, the percentage of home health patients with improvement in their surgical wounds was 88.6%.

## Home Health Patients Able To Take Oral Medications Correctly



- **Importance:** Taking medications correctly is important to the health status and quality of life of individuals living in the community. The home health team can help teach a patient ways to organize drugs and take them properly.
- **Overall Rate:** In 2012, the percentage of home health patients with improvement in their ability to take medications orally was 49.7%.
- **Groups With Disparities:**
  - In 2012, home health patients in the oldest group, 85 years and over, had the lowest percentage with improvement in their ability to take medications orally.
  - The percentages with improved ability to take medications orally was also lower among Hispanic and Asian home health patients than among White patients.
- **Achievable Benchmark:** The benchmark was achieved among home health patients ages 0-64 years and 65-74 years.



**Denominator:** Number of home health episodes of care in which a patient was unable to take oral medications independently at the start of the episode that ended during the measurement period.

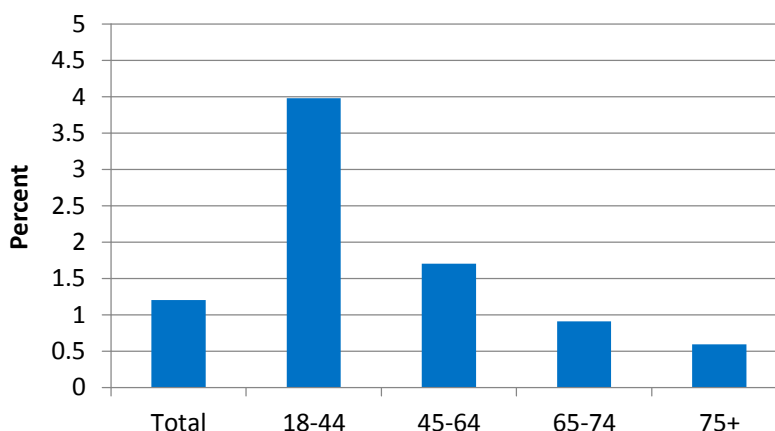
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## **Patient Safety in the Ambulatory Setting**

- Although patient safety initiatives usually focus on inpatient hospital events, adverse effects of medical care may be identified and treated in outpatient settings.
- Adverse effects of medical care can follow care or procedures in hospitals, emergency departments (EDs), physician offices, or other settings.
- Measures include:
  - Adults with a probable missed stroke in the emergency department
  - Adults age 65 and over who received potentially inappropriate prescription medications during the calendar year

## Missed Stroke in the Emergency Department

Adults with a probable missed stroke in the emergency department, by age, 2009



**Source:** Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project, State Inpatient Databases, 2009, and State Emergency Department Databases, 2008-2009, pooled data for nine States (AZ, FL, MA, MO, NH, NY, SC, TN, and UT).

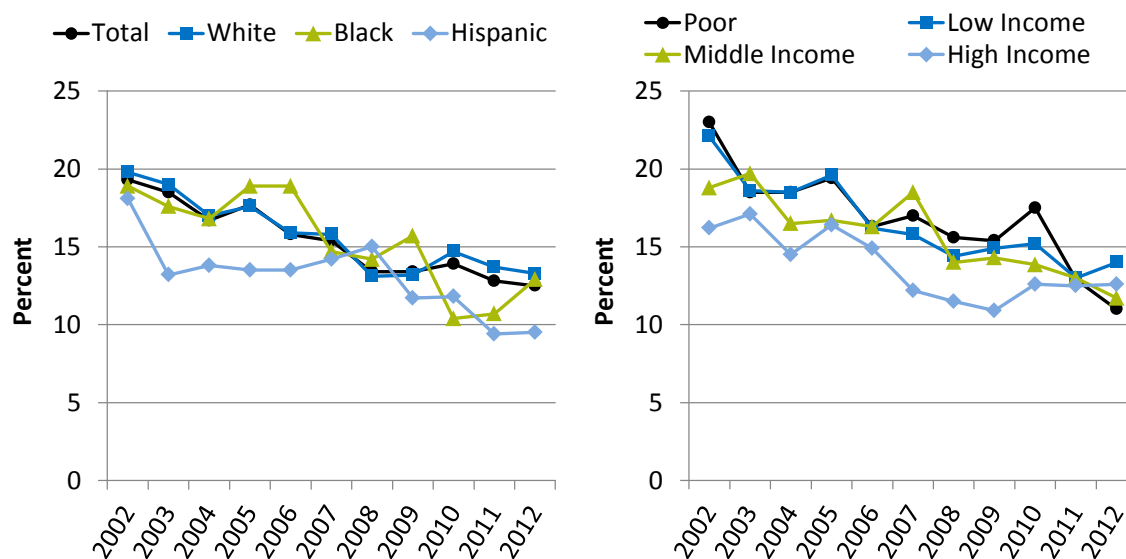
**Note:** For this measure, missed stroke is defined as a patient hospitalized for stroke who was treated and released from the ED within the prior 30 days with any diagnosis except cerebrovascular disease. For more details, see Newman-Toker DE, Moy E, Valente E, et al. Missed diagnosis of stroke in the emergency department: a cross-sectional analysis of a large population-based sample. *Diagnosis* 2014;1(2):155-66.

[http://www.degruyter.com/dg/viewarticle.fullcontentlink.pdf?eventlink/\\$002fj\\$002fdx.2014.1.issue-2\\$002fdx-2013-0038\\$002fdx-2013-0038.pdf?t:ac=j\\$002fdx.2014.1.issue-2\\$002fdx-2013-0038\\$002fdx-2013-0038.xml](http://www.degruyter.com/dg/viewarticle.fullcontentlink.pdf?eventlink/$002fj$002fdx.2014.1.issue-2$002fdx-2013-0038$002fdx-2013-0038.pdf?t:ac=j$002fdx.2014.1.issue-2$002fdx-2013-0038$002fdx-2013-0038.xml)

- **Importance:** Misdiagnosis of conditions in patients who seek care from the ED may result in death or disability.
- **Overall Rate:** In 2009, the percentage of adults with a probable missed stroke in the ED was 1.2%.
- **Groups With Disparities:** In 2009, patients ages 18-44 years were at the highest risk of being hospitalized for stroke within 30 days of being treated for dizziness or headache in the ED and subsequently released, compared with all other age groups. The likelihood of a missed stroke diagnosis decreased as patient age increased.

## Inappropriate Prescription Medications

Adults age 65 and over who received potentially inappropriate prescription medications during the calendar year, by race/ethnicity and family income, 2002-2012



**Source:** Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2002–2012.

**Note:** For this measure, lower rates are better. Prescription medications received include all prescribed medications initially purchased or otherwise obtained as well as any refills. White and Black are non-Hispanic. Hispanic includes all races. For more information on inappropriate medications, see The American Geriatrics Society 2012 Beers Criteria Update Expert Panel. American Geriatrics Society updated Beers Criteria for potentially inappropriate medication use in older adults. J Am Geriatr Soc 2012 Apr;60(4):616-31.

- **Importance:** Some drugs that are prescribed for older patients are known to be potentially harmful for this age group.
- **Change Over Time:**
  - From 2002 to 2012, the percentage of adults age 65 years and over who received potentially inappropriate prescription medications decreased overall and for all racial and ethnic groups and all income groups.
  - Poor adults had the largest decrease in the percentage who received potentially inappropriate medications (from 23% in 2002 to 11% in 2012).



## Patient Safety Infrastructure

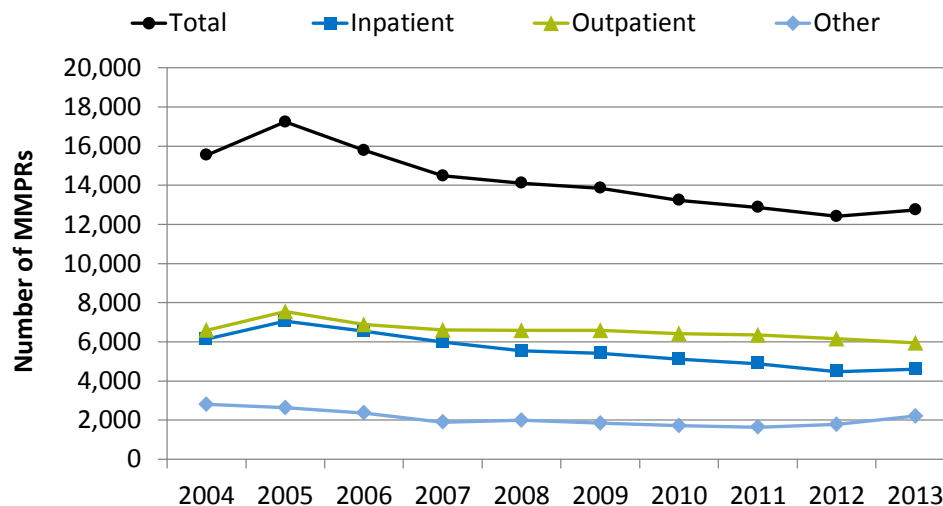
- Efforts to improve patient safety have led to various infrastructure enhancements.
  - National Practitioner Data Bank, a clearinghouse for information on medical malpractice payments and adverse actions against health care providers.
  - Culture of patient safety, recognized as important for reducing adverse events, and surveys to monitor the culture.
  - Patient Safety Organizations, designed to create a protected space in which providers can learn from adverse events without fear of legal action.

### Patient Safety Infrastructure: National Practitioner Data Bank

- Medical malpractice actions are one way to flag potential medical errors.
- Medical Malpractice Payment Reports (MMPRs) are submitted to the National Practitioner Data Bank by medical malpractice payers:
  - Report of a monetary exchange made for the benefit of a physician, dentist, or other health care provider
  - Result of a settlement or judgment of a written complaint or claim based on that provider's delivery of or failure to deliver health care services.

## Medical Malpractice Payment Reports

Number of Medical Malpractice Payment Reports, by health care setting, 2004-2013

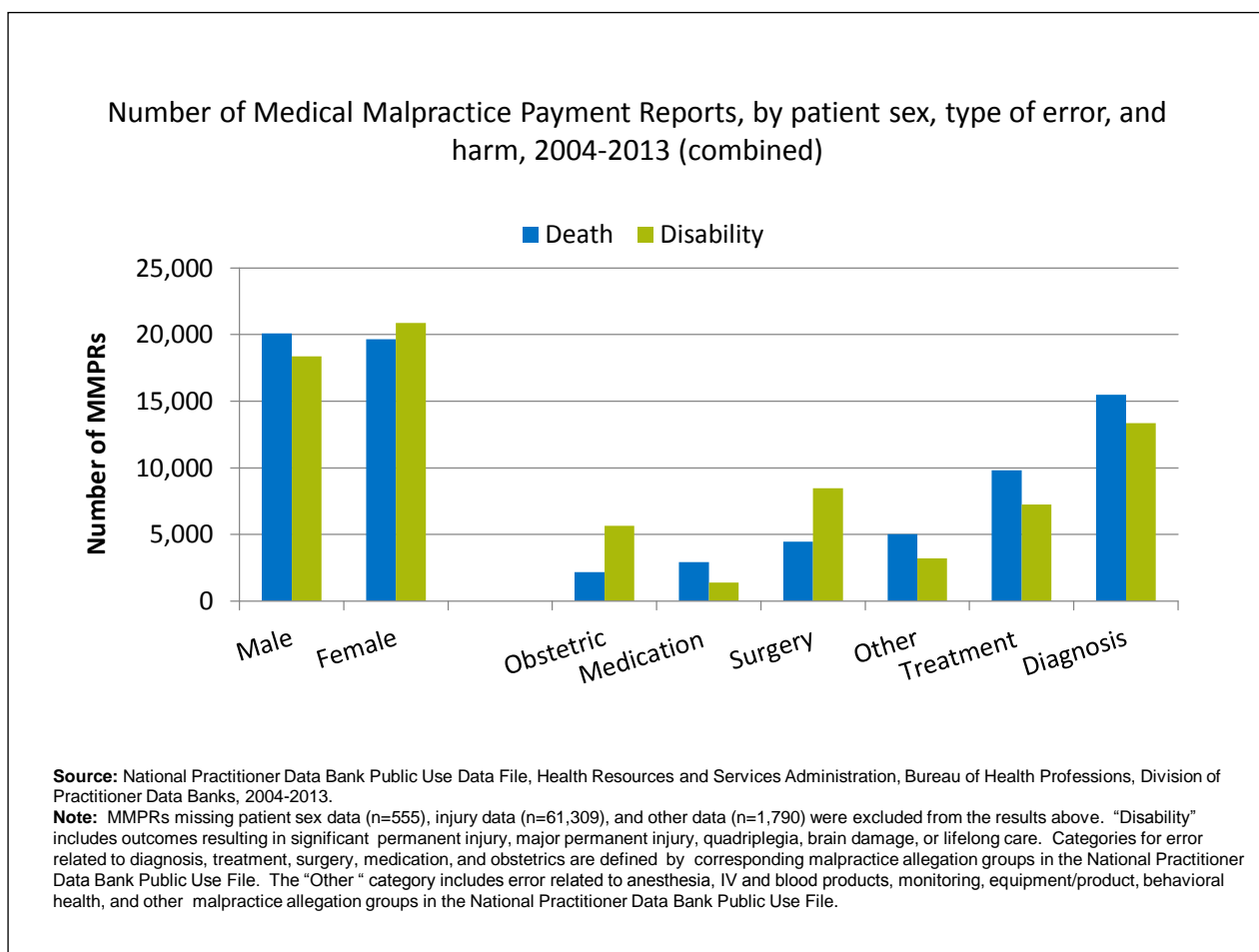


**Source:** National Practitioner Data Bank Public Use Data File, Health Resources and Services Administration, Bureau of Health Professions, Division of Practitioner Data Banks, 2004-2013.

**Note:** Other includes MMPRs related to unknown settings and a combination of inpatient and outpatient settings.

- **Change Over Time:** From 2004 to 2013, the number of MMPRs per year decreased by 18%, from 15,537 in 2004 to 12,708 in 2013.
- **Differences Between Settings:**
  - Of 142,219 MMPRs from 2004 to 2013, more related to care in the outpatient setting (65,621) than in the inpatient setting (55,761).
  - Diagnosis-related and treatment-related errors were the most frequent types of error, each accounting for 27% of reports. Medication errors accounted for only 5% of MMPRs (data not shown).

## Variation in Medical Malpractice Payment Reports



- **Groups With Disparities:**

- In 2004-2013, more MMPRs were related to female patients (40,518) than male patients (38,466). The harm outcome of disability accounted for a larger share of MMPRs involving female patients than MMPRs involving male patients, while a greater percentage of MMPRs involving males documented the harm outcome of death.

- **Differences in Type of Error and Harm:**

- In 2004-2013, MMPRs related to diagnosis, treatment, and medication were more likely to document death than disability as the harm outcome. MMPRs related to surgery and obstetrics were more likely to document disability than death.

## **Patient Safety Infrastructure: Culture**

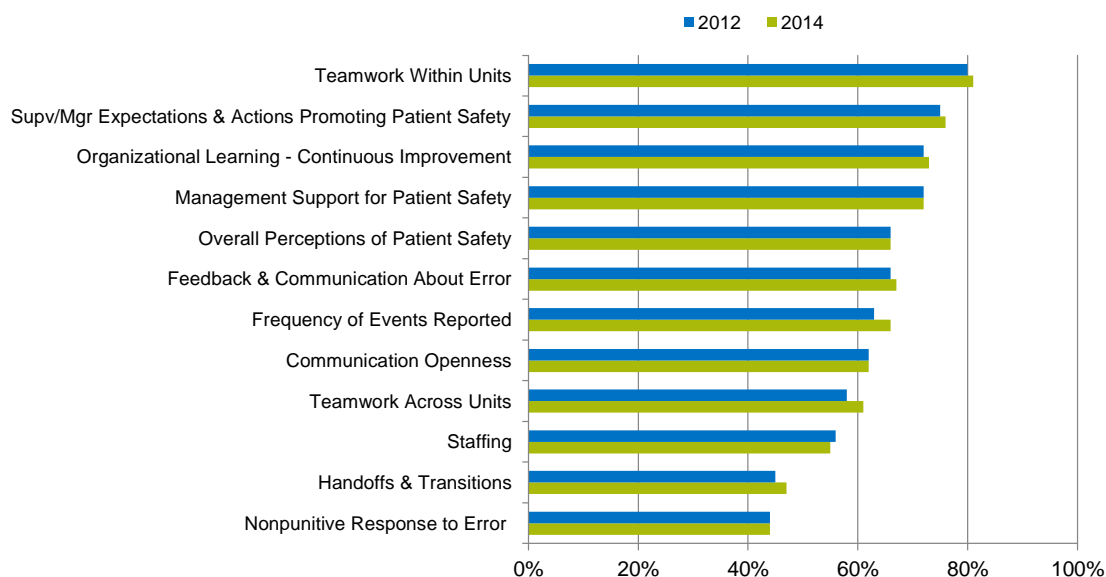
- High-reliability organizations—those that perform high-risk work but achieve low rates of adverse events—establish “cultures of safety” (Chassin and Loeb, 2013).
- The culture is characterized by:
  - Shared dedication to making work safe,
  - Nonpunitive reporting and communication about errors,
  - Collaboration and teamwork across disciplines, and
  - Adequate resources to prevent adverse events.
- A patient safety practice widely encouraged by experts is teamwork training. One model—Crew Resource Management (CRM)—applies an array of nontechnical skills (e.g., communication techniques), which are also known as “safety behaviors.” These are used in concert with the technical and knowledge requirements of safety-sensitive jobs to develop high-reliability teams.

## **Measures of Patient Safety Culture**

- Average percent positive responses on the AHRQ Hospital Survey on Patient Safety Culture
- Average percent positive responses on the AHRQ Medical Office Survey on Patient Safety Culture
- Average percent positive responses for patient safety culture composite (Sexton, et al., 2006) among participants in the National Center for Patient Safety (NCPS) High Reliability Team training
- Percent change from baseline in observed annual mortality rate per 1,000 procedures, by medical team training status of Veterans Health Administration facility

## Hospital Patient Safety Culture Survey Results

Average percent positive responses for patient safety culture composite from hospitals, 2012 and 2014



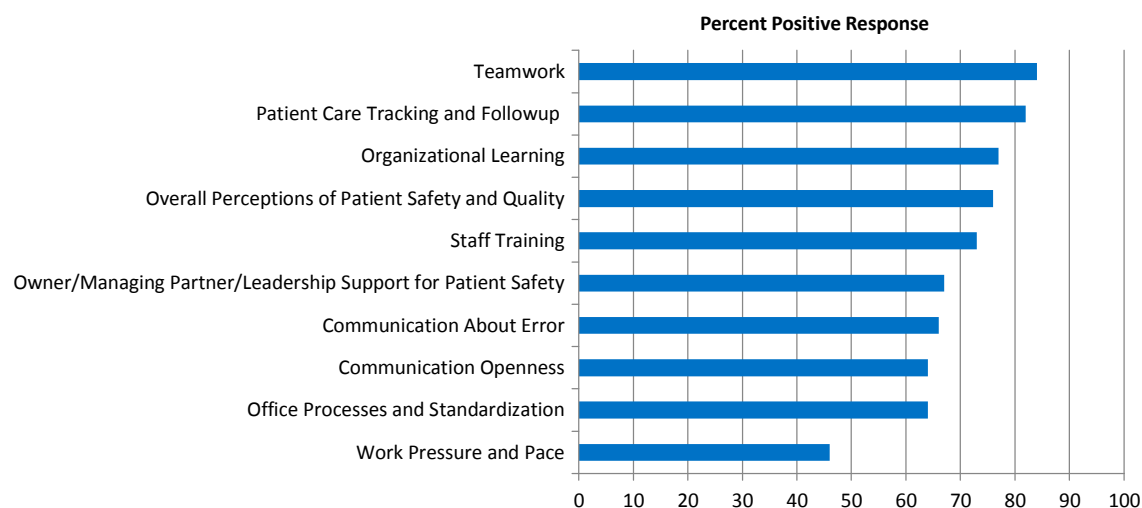
**Source:** Agency for Healthcare Research and Quality, Hospital Survey on Patient Safety Culture user comparative database report, 2012 (<http://www.ahrq.gov/professionals/quality-patient-safety/patientsafetyculture/hospital/2012/index.html>) and 2014 (<http://www.ahrq.gov/professionals/quality-patient-safety/patientsafetyculture/hospital/2014/index.html>).

**Note:** Hospital staff voluntarily assessed the culture of safety in their facilities. Percent positive is the percentage of positive responses (e.g., Agree) to positively worded items (e.g., People support one another in this unit) or negative responses (e.g., Disagree) to negatively worded items (e.g., We have problems in this unit).

- **Change Over Time:**
  - Seven of 12 composites of questions about patient safety culture demonstrated a slightly higher percentage of positive responses from hospital staff in 2014 compared with 2012.
  - One composite, staffing, received a lower percent positive response by hospital staff in 2014 than in 2012.
  - Four composites (Management Support for Patient Safety, Overall Perceptions of Patient Safety, Communication Openness, and Nonpunitive Response to Error) demonstrated similar percent positive responses in the 2 years.
- **Areas of Strength and Weakness:**
  - Teamwork Within Units had the highest percent positive responses.
  - Handoffs and Transitions and Nonpunitive Response to Error had the lowest percent positive responses.

## Medical Office Patient Safety Culture Survey Results

Average percent positive responses for patient safety culture composite from medical offices, by composite, 2012

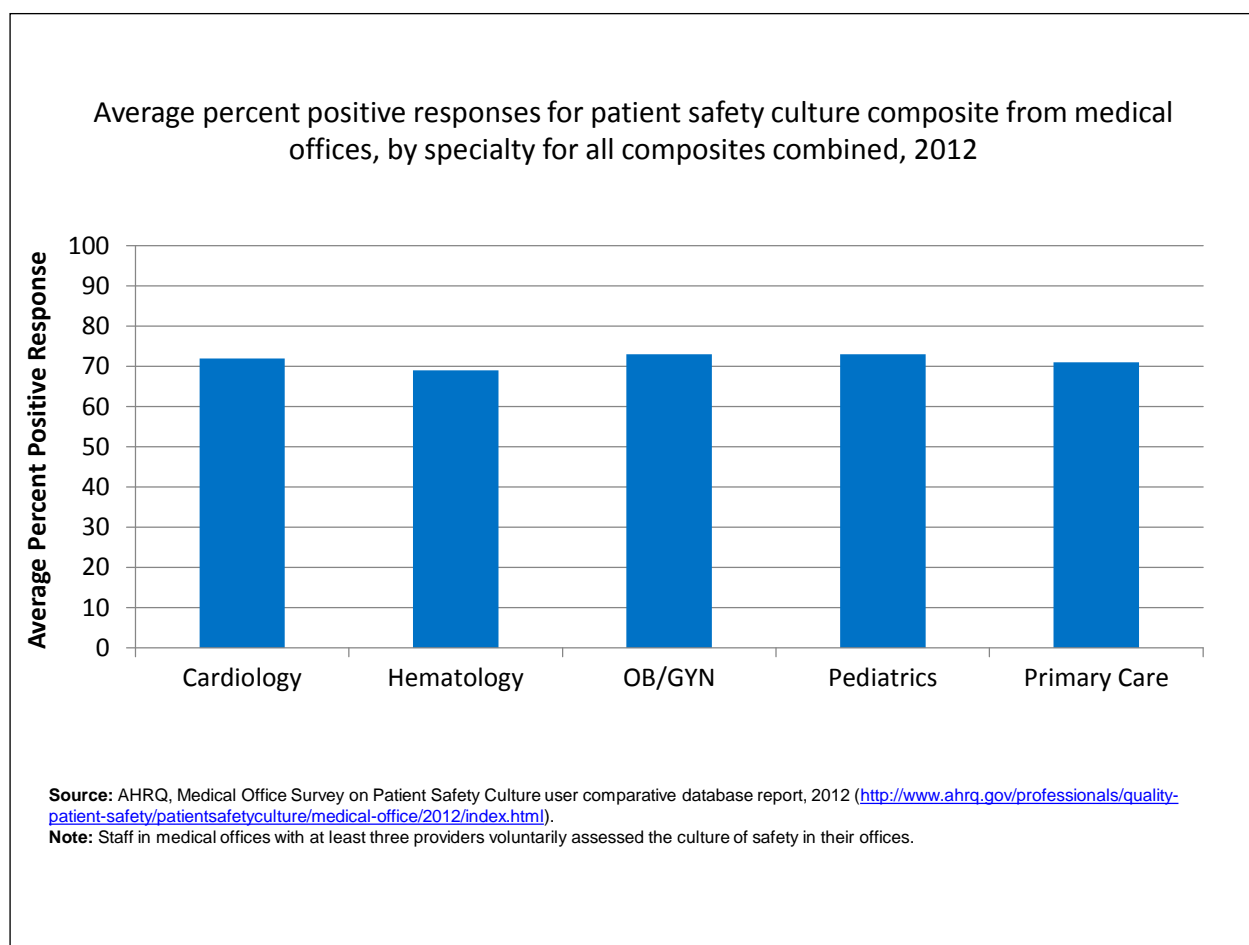


**Source:** AHRQ, Medical Office Survey on Patient Safety Culture user comparative database report, 2012 (<http://www.ahrq.gov/professionals/quality-patient-safety/patientsafetyculture/medical-office/2012/index.html>).

**Note:** Staff in medical offices with at least three providers voluntarily assessed the culture of safety in their offices.

- Overall Rate:** The highest percent positive responses were for composites of questions about teamwork and patient care (84% and 82%, respectively), and the composite on work pressure and pace had the lowest percent positive responses (46%).

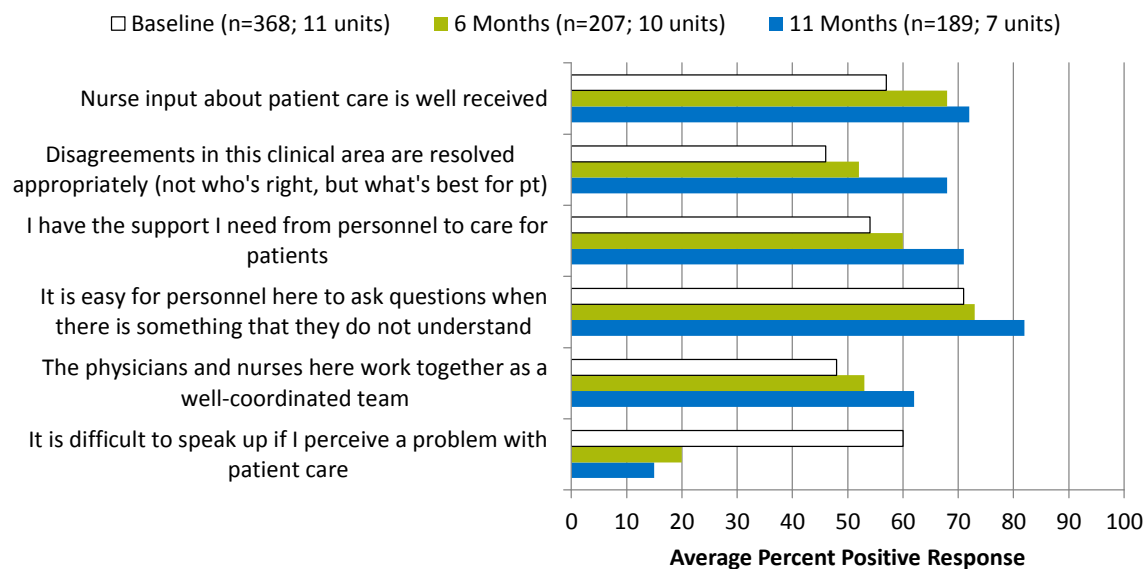
### Variation in Medical Office Patient Safety Culture Survey Results



- **Differences by Specialty:** No clear patterns emerged across specialties (Cardiology, Hematology, OB/GYN, Pediatrics, Primary Care) on the patient safety culture composites in 2012.

## High Reliability Team Training

Average percent positive responses for patient safety culture composite among participants in the NCPS High Reliability Team training, comparing baseline with 6 and 11 months, 2009



**Source:** Sculli GL, Fore AM, West P, et al. Spotlight on safety: nursing crew resource management: a followup report from the Veterans Health Administration. J Nurs Adm 2013;43(3):122-6.

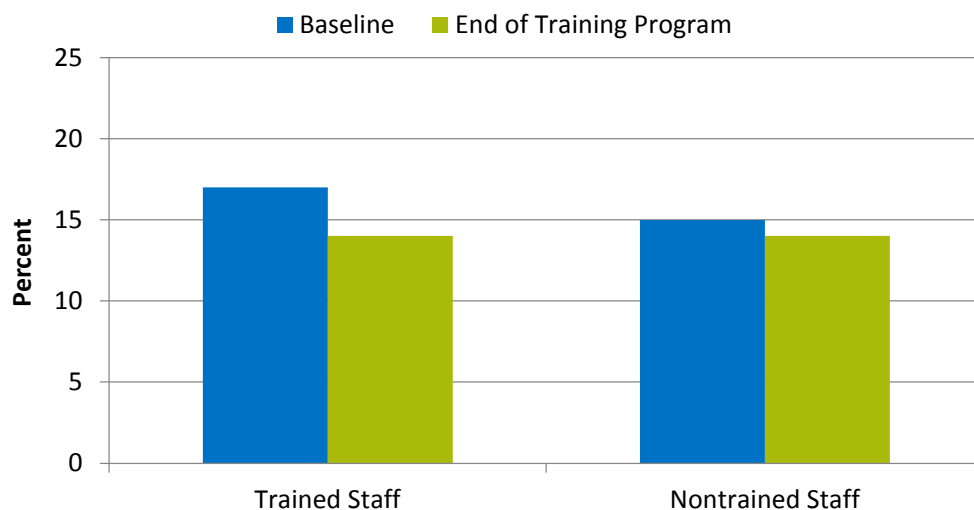
**Note:** Statistically significant ( $p < 0.05$ ), comparing baseline with end-of-study percent positive response rates. For the first five measures, higher rates are better. For the last measure, lower rates are better.

- Change Over Time:** The NCPS Clinical Team Training Programs at the Veterans Health Administration have used CRM since its inception in 1999. Among team training participants in 2009, staff perception of teamwork had increased nearly 1 year later. The average percent positive response to 10 of 12 composites of questions, including those in the chart, showed statistically significant improvement.



### Mortality Rate by Medical Team Training Status

Percent change from baseline in observed annual mortality rate per 1,000 procedures, by medical team training status of facility, 2006-2008 (combined)



**Source:** Neily J, Mills PD, Young-Xu Y, et al. Association between implementation of a medical team training program and surgical mortality. JAMA 2010;304(15):1693-700.

**Note:** Statistically significant ( $p < 0.05$ ), comparing baseline with end-of-study mortality rates. For this measure (mortality), lower rates are better.

- Change Over Time:** The NCPS Clinical Team Training Programs at the Veterans Health Administration have used CRM since its inception in 1999. In the 2006-2008 period, facilities participating in team training experienced a statistically significant reduction in the annual mortality rate (18% relative decrease), compared with a nonsignificant relative reduction (7%) among untrained facilities.

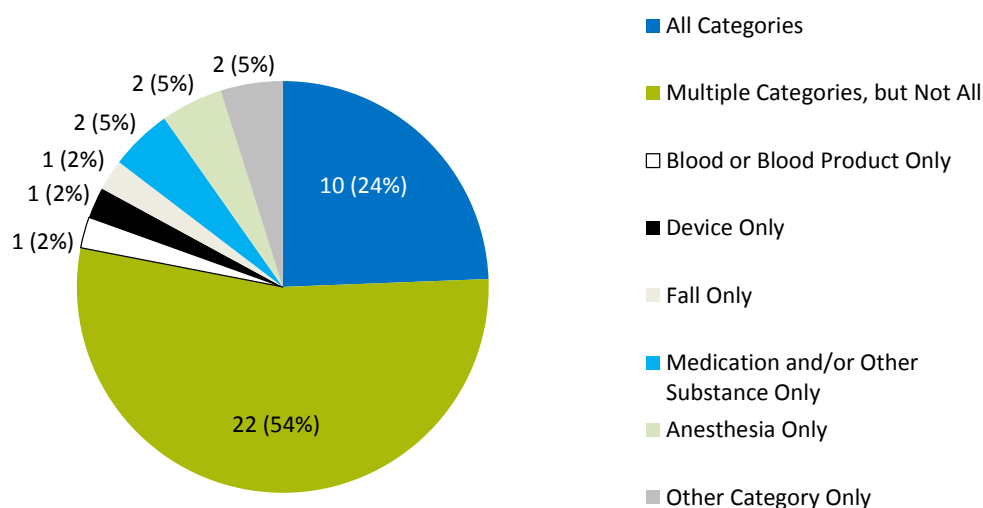
## **Patient Safety Infrastructure: Patient Safety Organizations**

- Patient safety organizations (PSOs) enable health care providers to voluntarily report, discuss, and learn from patient safety events and quality analyses on a privileged and confidential basis.
- PSOs aim to reduce preventable adverse events, near-misses, and unsafe conditions in all health care settings.
- Measures related to PSOs include:
  - Distribution of Patient Safety Organizations by category of event reports collected
  - Reduction in surgical site infections among Vascular Quality Initiative Centers that expanded from sporadic to routine chlorhexidine use

PSOs were established under the Patient Safety and Quality Improvement Act of 2005.

## Patient Safety Organizations

Distribution of Patient Safety Organizations by category of event reports collected, 2013



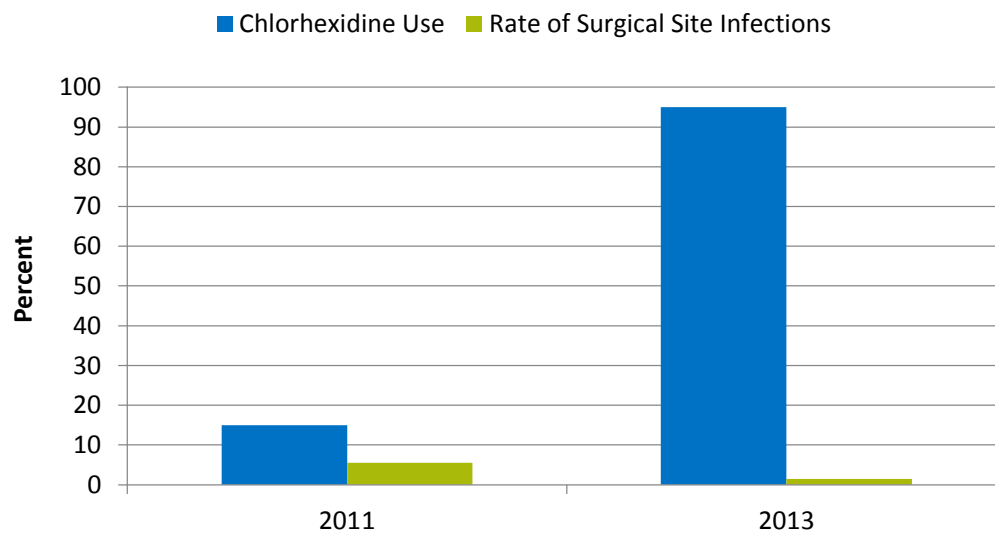
**Source:** Agency for Healthcare Research and Quality, Patient Safety Organization Profile, Calendar Year 2013.

**Note:** Only self-reporting PSOs that received at least one patient safety report were included in this figure. PSOs can collect reports on more than one type of event. Percentages do not add to 100 due to rounding.

- Overall Rate:** More than three-quarters of PSOs that received at least one patient safety event report in 2013 received reports in multiple or all event categories. Four of every five of these PSOs also received reports on quality.

### Reduction in Surgical Site Infections Among Facilities With Routine Chlorhexidine Use

Reduction in surgical site infections among Vascular Quality Initiative Centers that improved to routine chlorhexidine use, 2011 and 2013



Source: Vascular Quality Initiative® data, 2011-2013.

- Overall Rate:** The Society for Vascular Surgery PSO identified skin preparation using iodine—rather than chlorhexidine disinfectant—as one of three factors that predicted a higher likelihood of SSI in patients receiving a lower extremity bypass operation. Provider behavior changed as a result of receiving performance reports on the factors that increase SSI. Overall use of chlorhexidine increased and the majority of centers that rarely or selectively used chlorhexidine began to use it routinely. Among centers that improved chlorhexidine usage to routine use, the rate of SSIs decreased from 5.5% to 1.5% between 2011 and 2013.

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