Chartbook on Patient Safety

AHRQ
Agency for Healthcare
Research and Quality

NATIONAL HEALTHCARE QUALITY AND DISPARITIES REPORT

CHARTBOOK ON PATIENT SAFETY

ACKNOWLEDGMENTS

CONTENTS

Introduction

This Patient Safety Chartbook is part of a family of documents and tools that support the *National Healthcare Quality and Disparities Report* (NHQDR). The NHQDR is an annual report to Congress mandated in the [Healthcare Research and Quality Act of 1999](#) (P.L. 106-129). The NHQDR provides a comprehensive overview of the quality of healthcare received by the general U.S. population and disparities in care experienced by different racial and socioeconomic groups.

The purpose of the reports is to assess the performance of our healthcare system and to identify areas of strength and weakness in the healthcare system along three main axes: the portrait of American healthcare, special emphasis topics, and quality and disparities tables.

The reports are based on more than 700 measures of quality and disparities covering a broad array of healthcare services and settings. Data generally cover 2000 through 2023. The reports are produced with the help of a Federal Interagency Work Group led by the Agency for Healthcare Research and Quality (AHRQ) and submitted on behalf of the Secretary of the U.S. Department of Health and Human Services (HHS). To access the most recent NHQDR, including methodologies and measure lists, go to https://www.ahrq.gov/research/findings/nhqrdr23/index.html.

Chartbook Organization and Background

The chartbooks are organized around six priority areas:

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, such as 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 healthcare delivery models

Patient Safety is one of the six national priorities identified by the NHQDR. These priority areas are interrelated and work to support all priority areas and can support necessary and critical improvements in making care safer. Readers can access the latest NHQDR chartbooks at https://www.ahrq.gov/research/findings/nhqrdr/chartbooks/index.html.

Priority 1: Making Care Safer by Reducing Harm Caused in the Delivery of Care

AHRQ has identified three long-term goals related to patient safety: reduce preventable hospital admissions and readmissions, reduce the incidence of adverse healthcare-associated conditions, and reduce harm from inappropriate or unnecessary care. This chartbook focuses on adverse healthcare-associated conditions and harm from inappropriate or unnecessary care.

Preventable admissions and readmissions can result from problems with patient safety or problems with care coordination. We have chosen to include most measures of preventable admissions and readmissions in the Care Coordination chartbook. To access the most recent Care Coordination chartbook, go to https://www.ahrq.gov/research/findings/nhqrdr/chartbooks/ carecoordination/index.html.

Patient Safety Origins in the United States

Patient safety is the freedom from accidental or preventable injuries produced by medical care (Kohn, et al., 2000). Patient safety research examines systems-based gaps to improve safety and patient outcomes.

Medical error and other patient safety issues can be deadly:

- One estimate of the number of hospital-acquired conditions in U.S. hospitals in 2017 was approximately 2,550,000 cases (AHRQ, 2019a).
- One estimate of the age-standardized mortality rate due to adverse effects of medical treatment was 1.15 per 100,000 population in 2016 (Sunshine, et al., 2019).

AHRQ is one of the lead federal agencies for patient safety research. AHRQ partners with many federal agencies to support patient safety and quality improvement work. These agencies include the Centers for Medicare & Medicaid Services, Centers for Disease Control and Prevention, Food and Drug Administration, Health Resources and Services Administration, and other agencies within and outside HHS.

Key Definitions

The patient safety field uses terms including *adverse event* and *patient safety event* to describe incidents in which patient harm may occur as a result of healthcare (rather than from an underlying disease). Among other terms used by organizations such as The Joint Commission are *sentinel events*. These patient safety events result in death, permanent harm, or serious temporary harm to a patient.

Some events pose hazards to patients but do not result in harm. These patient safety events are called *near-misses*. Patients experience a near-miss when they are exposed to a hazardous situation but do not experience harm (either through luck or early detection).

These definitions are defined on AHRQ's PSNet website (https://psnet.ahrq.gov/primer/ patient-safety-101). More information on sentinel events is available on The Joint Commission website at https://www.jointcommission.org/resources/patient-safety-topics/sentinel-event/.

Patient Safety Research Landscape

Since 1999, the patient safety field has made advances such as the reduction of select healthcare-associated infections and medication-related events. These advances have been made through novel strategies, such as clinical decision support, surveillance, treatment protocols, and education and training through simulation. Advancements in safety research and implementation are further described on AHRQ's PSNet.

In 2001, AHRQ began publishing [Making Healthcare Safer](#), a compendium of existing and emerging patient safety best practices. In 2022, AHRQ commissioned the fourth edition, which is in progress. Reports produced so far, as well as research protocols, are available at https://www.ahrq.gov/research/findings/making-healthcare-safer/mhs4/index.html.

In September 2020, AHRQ and the Institute for Healthcare Improvement co-published the [National Action Plan to Advance Patient Safety](#). AHRQ and several organizations committed to patient safety developed this plan. It focuses on culture, leadership, and governance; patient and family engagement; workforce safety; and learning systems—all foundational needs for safe care.

The body of research examining disparities in patient safety continues to evolve in the United States and abroad (Thomas, et al., 2020; Metersky, et al., 2011; Piccardi, et al., 2018; Noursi, et al., 2020; Fasano, et al., 2020).

Chartbook Content

This chartbook includes:

- Summaries of trends across measures of patient safety from the NHQDR.
- Figures illustrating select measures of patient safety.
- Supplemental descriptions and data on patient safety measures from several outside sources.

References:

- [Appendix A. Methods of the National Healthcare Quality and Disparities Report and Related Chartbooks](#) contains information about methods used in the chartbook.
- A Data Query tool (https://nhqrnet.ahrq.gov/inhqrdr/data/query) provides access to most NHQDR data tables.

Data Sources:

- Agency for Healthcare Research and Quality (AHRQ):

  - Healthcare Cost and Utilization Project (HCUP)
  - Medical Expenditure Panel Survey (MEPS)
  - Quality and Safety Review System (QSRS)

- Centers for Disease Control and Prevention (CDC):

  - National Vital Statistics System – Natality (NVSS-N)

- Centers for Medicare & Medicaid Services (CMS):

  - Home Health Care Consumer Assessment of Healthcare Providers and Systems (HHCAHPS)
  - Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS)

- Hospital Inpatient Quality Reporting (HIQR) (formerly the Quality Improvement Organization)
- Outcome and Assessment Information Set (OASIS)
- Minimum Data Set (MDS)

Trends Across NHQDR Priorities

Number and percentage of quality measures improving, not changing, or worsening from 2002 to 2022, total and by priority area

Legend: ■ Improving □ Not Changing ■ Worsening

Priority area	Improving	Not Changing	Worsening
Total (n=184)	82	90	12
Person-Centered Care (n=27)	11	16	
Patient Safety (n=28)	16	11	1
Healthy Living (n=55)	26	25	4
Effective Treatment (n=38)	15	19	4
Care Coordination (n=28)	11	14	3
Affordable Care (n=2)		2	
Access (n=6)	3	3	
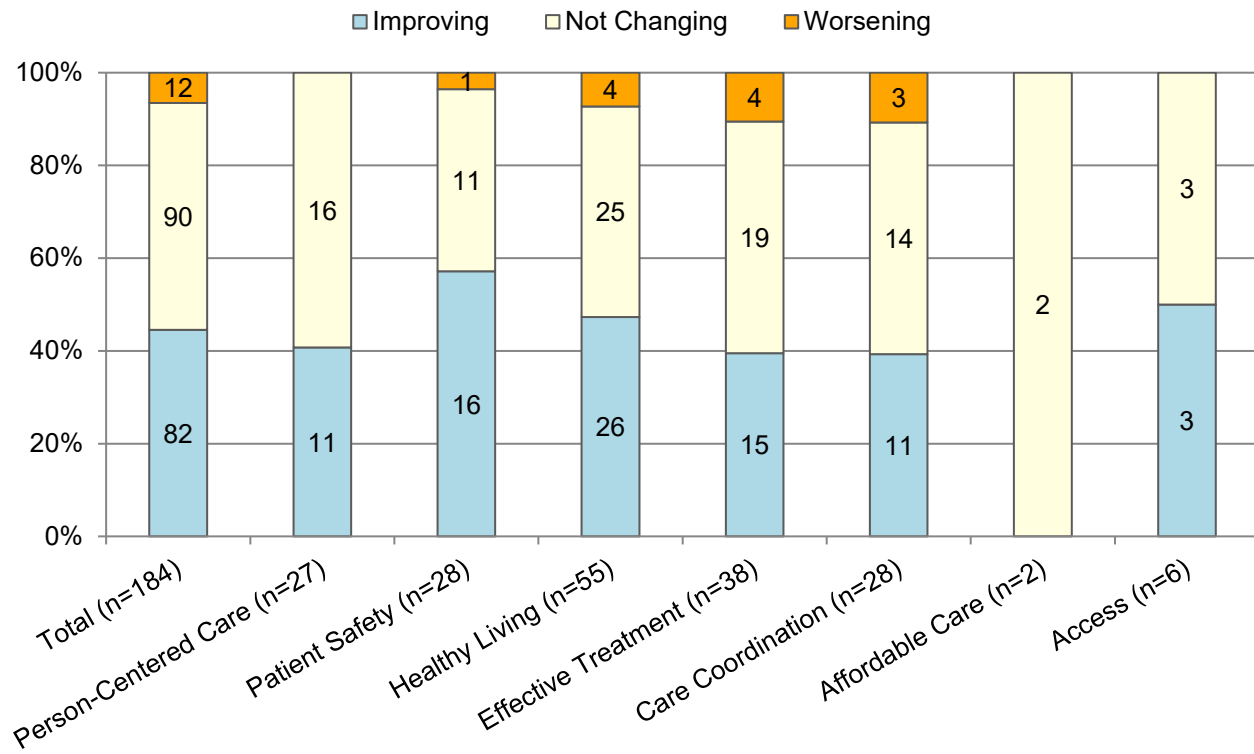
Key: n = number of measures.
Note: This graph is limited to those measures that have the minimum four data points that AHRQ requires to conduct a trend analysis. For each measure with at least four estimates over time, unweighted log-linear regression is used to calculate average annual percentage change (APC) and to assess the statistical significance of the rate of change (p <0.10). Rates are aligned so that negative change indicates improved care. The model used is $\ln(M) = \beta_0 + \beta_1 Y$, where $\ln(M)$ is the natural logarithm of the aligned rate, β_0 is the intercept or constant, and β_1 is the coefficient corresponding to year Y (e.g., the average annual percentage change = $100 \cdot (\exp(\beta)\text{-}1)$).

- **Improving** = Average annual percentage change >1% per year in a favorable direction and p <0.10.
- **Not Changing** = Average annual percentage change ≤1% per year or p ≥0.10.
- **Worsening** = Average annual percentage change >1% per year in an unfavorable direction and p <0.10.

- Through 2022, across a broad spectrum of healthcare quality measures, less than half (45%) showed improvement.
- Person-Centered Care: 41% of person-centered care measures were improving overall.

- Patient Safety: More than half (57%) of patient safety measures were improving overall.

    - The one measure with worsening results was "Adults who reported a home health provider asking to see all the prescription and over-the-counter medicines they were taking when they first started getting home health care."

- Healthy Living: Nearly half (47%) of healthy living measures were improving overall.
- Effectiveness of Care: About 40% of effective treatment measures were improving overall.
- Care Coordination: About 40% of care coordination measures were improving overall.
- Affordable Care: No affordable care measures showed improvement overall.
- Access: Half of access measures were improving overall.

For more information, refer to the [2023 National Healthcare Quality and Disparities Report](#).

Trends in Patient Safety

Trends by Setting of Care

Number and percentage of patient safety measures improving, not changing, or worsening from 2002 to 2022, by setting of care
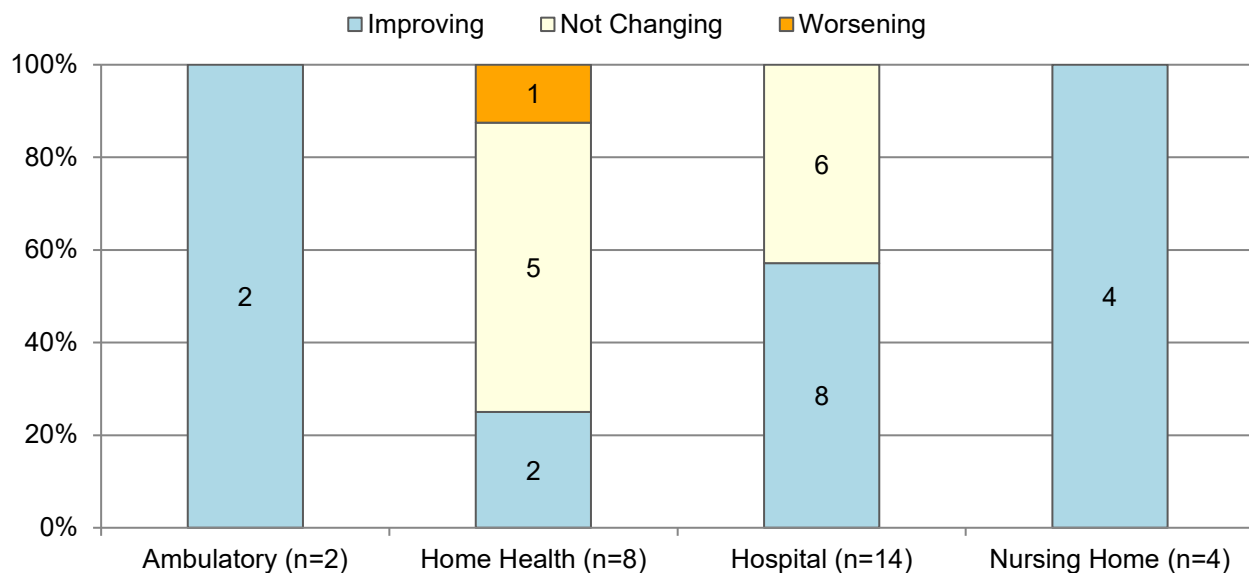
Key: n = number of measures.

- **Importance:** The chartbook is organized around setting of care; stratifying trends by care setting provides insight into which settings are exhibiting more or fewer measures improving.
- **Findings:**

    - Both ambulatory care measures, 25% of home health measures, 57% of hospital measures, and all nursing home measures were improving overall.
    - The home health measure that is worsening is "Adults who reported a home health care provider asking to see all the prescription and over-the-counter medicines they were taking when they first started getting home health care," which declined from 78.8% in 2012 to 73.3% in 2022.

Ambulatory Measures:

- Improving:

    1. Adults age 65 and over who received in the calendar year at least 1 of 11 prescription medications that should be avoided in older adults
    2. Adults age 65 and over who received in the calendar year at least 1 of 33 potentially inappropriate prescription medications for older adults

Home Health Measures:

- Improving:

    1. Home health care patients whose surgical wound improved
    2. Home health care patients whose management of oral medications improved

- Not Changing:

    1. Adults who reported a home health care provider talking with them about how to set up their home so they can move around safely when they first started getting home health care
    2. Adults who reported a home health care provider talking with them about all the prescription and over-the-counter medicines they were taking when they first started getting home health care
    3. Adults who reported that home health care providers talked with them about the purpose of taking their new or changed prescription medicines in the last 2 months of care
    4. Adults who reported that home health care providers talked with them about when to take medicines in the last 2 months of care
    5. Adults who reported that home health care providers talked with them about the side effects of medicines in the last 2 months of care

- Worsening:

    1. Adults who reported a home health care provider asking to see all the prescription and over-the-counter medicines they were taking when they first started getting home health care

Hospital Measures:

- Improving:

    1. Postoperative sepsis per 1,000 elective-surgery admissions, age 18 and over
    2. Hospital admissions with central venous catheter-related bloodstream infection per 1,000 medical and surgical discharges of length 2 or more days, age 18 and over or obstetric admissions
    3. Postoperative pulmonary embolism or deep vein thrombosis per 1,000 surgical admissions, age 18 and over
    4. Postoperative respiratory failure, prolonged mechanical ventilation, or reintubation per 1,000 elective-surgery admissions, age 18 and over
    5. Postoperative acute kidney injury requiring dialysis per 1,000 elective-surgery admissions, age 18 and over

6. Hospital admissions with iatrogenic pneumothorax per 1,000 medical and surgical admissions, age 18 and over
7. Deaths per 1,000 elective-surgery admissions who developed serious treatable complications of care during hospitalization, ages 18-89 or obstetric admissions
8. Deaths per 1,000 hospital admissions with expected low mortality, age 18 and over or obstetric admissions

- Not Changing:

1. Perioperative hemorrhage or hematoma with surgical drainage or evacuation per 1,000 surgical admissions, age 18 and over
2. Postoperative hip fracture per 1,000 surgical admissions who were not susceptible to falling, age 18 and over
3. Reclosure of postoperative abdominal wound dehiscence per 1,000 abdominopelvic-surgery admissions of length 2 or more days, age 18 and over
4. Accidental puncture or laceration during a procedure per 1,000 medical and surgical admissions, age 18 and over
5. Accidental puncture or laceration during a procedure per 1,000 medical and surgical admissions, age less than 18 years
6. Birth trauma - injury to neonate per 1,000 live births

Nursing Home Measures:

- Improving:

1. Long-stay nursing home residents with a urinary tract infection
2. Long-stay nursing home residents experiencing one or more falls with major injury
3. Low-risk, long-stay nursing home residents with a catheter inserted and left in the bladder
4. Short-stay nursing home patients with pressure ulcers that are new or worsened

Trends by Type of Measure

Number and percentage of patient safety measures improving, not changing, or worsening from 2002 to 2022, by type of measure
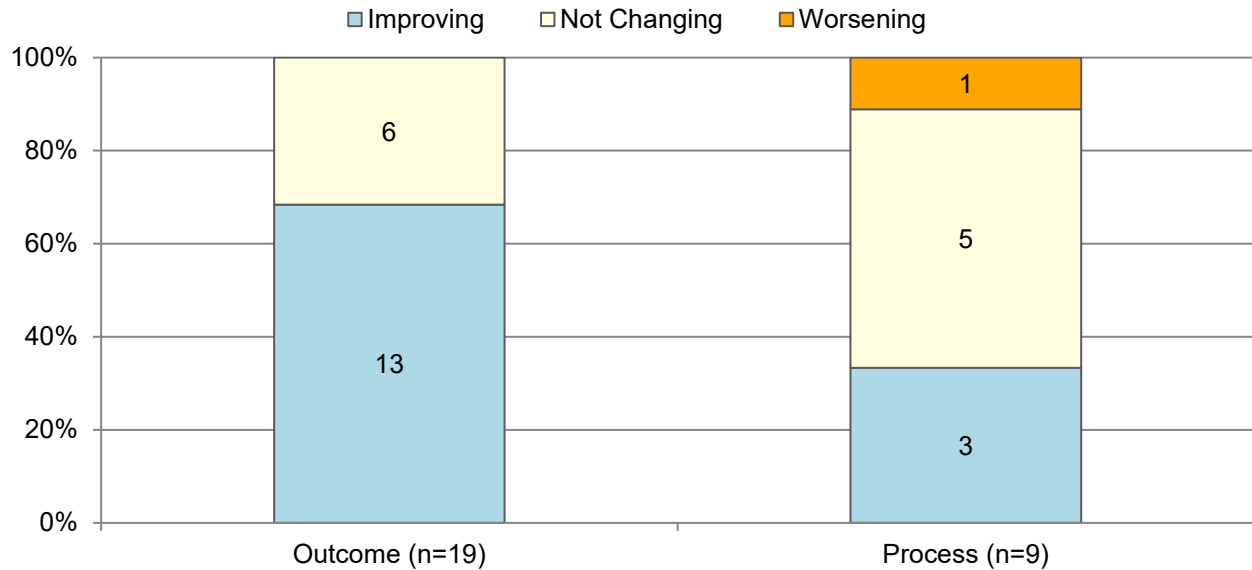
Key: n = number of measures.

- **Importance:** The ultimate goal of quality improvement is to produce better patient outcomes. Improvements in processes may or may not lead to improved patient outcomes.
- **Findings:**

  - Most (68%) outcome measures improved, while 33% of process measures improved. Type of measure and setting of care are related; 14 of 19 outcome measures are hospital measures, while no process measures are hospital measures.
  - The process measure that is worsening is "Adults who reported a home health care provider asking to see all the prescription and over-the-counter medicines they were taking when they first started getting home health care," which declined from 78.8% in 2012 to 73.3% in 2022.

Outcome Measures:

- Improving:

  1. Postoperative sepsis per 1,000 elective-surgery admissions, age 18 and over
  2. Hospital admissions with central venous catheter-related bloodstream infection per 1,000 medical and surgical discharges of length 2 or more days, age 18 and over or obstetric admissions
  3. Postoperative pulmonary embolism or deep vein thrombosis per 1,000 surgical admissions, age 18 and over
  4. Postoperative respiratory failure, prolonged mechanical ventilation, or reintubation per 1,000 elective-surgery admissions, age 18 and over
  5. Postoperative acute kidney injury requiring dialysis per 1,000 elective-surgery admissions, age 18 and over

6. Home health care patients whose surgical wound improved
7. Hospital admissions with iatrogenic pneumothorax per 1,000 medical and surgical admissions, age 18 and over
8. Deaths per 1,000 elective-surgery admissions who developed serious treatable complications of care during hospitalization, ages 18-89 or obstetric admissions
9. Deaths per 1,000 hospital admissions with expected low mortality, age 18 and over or obstetric admissions
10. Home health care patients whose management of oral medications improved
11. High-risk, long-stay nursing home residents with pressure ulcer
12. Long-stay nursing home residents with a urinary tract infection
13. Short-stay nursing home patients with pressure ulcers that are new or worsened

- Not Changing:

    1. Perioperative hemorrhage or hematoma with surgical drainage or evacuation per 1,000 surgical admissions, age 18 and over
    2. Postoperative hip fracture per 1,000 surgical admissions who were not susceptible to falling, age 18 and over
    3. Reclosure of postoperative abdominal wound dehiscence per 1,000 abdominopelvic-surgery admissions of length 2 or more days, age 18 and over
    4. Accidental puncture or laceration during a procedure per 1,000 medical and surgical admissions, age 18 and over
    5. Birth trauma - injury to neonate per 1,000 live births
    6. Long-stay nursing home residents experiencing one or more falls with major injury

Process Measures:

- Improving:

    1. Adults age 65 and over who received in the calendar year at least 1 of 11 prescription medications that should be avoided in older adults
    2. Adults age 65 and over who received in the calendar year at least 1 of 33 potentially inappropriate prescription medications for older adults
    3. Low-risk, long-stay nursing home residents with a catheter inserted and left in the bladder

- Not Changing:

    1. Adults who reported a home health care provider talking with them about how to set up their home so they can move around safely when they first started getting home health care
    2. Adults who reported a home health care provider talking with them about all the prescription and over-the-counter medicines they were taking when they first started getting home health care
    3. Adults who reported that home health care providers talked with them about the purpose of taking their new or changed prescription medicines in the last 2 months of care
    4. Adults who reported that home health care providers talked with them about when to take medicines in the last 2 months of care

5. Adults who reported that home health care providers talked with them about the side effects of medicines in the last 2 months of care

- Worsening:

1. Adults who reported a home health care provider asking to see all the prescription and over-the-counter medicines they were taking when they first started getting home health care

Trends by Sub-Area

Number and percentage of patient safety measures improving, not changing, or worsening from 2002 to 2022, by sub-area
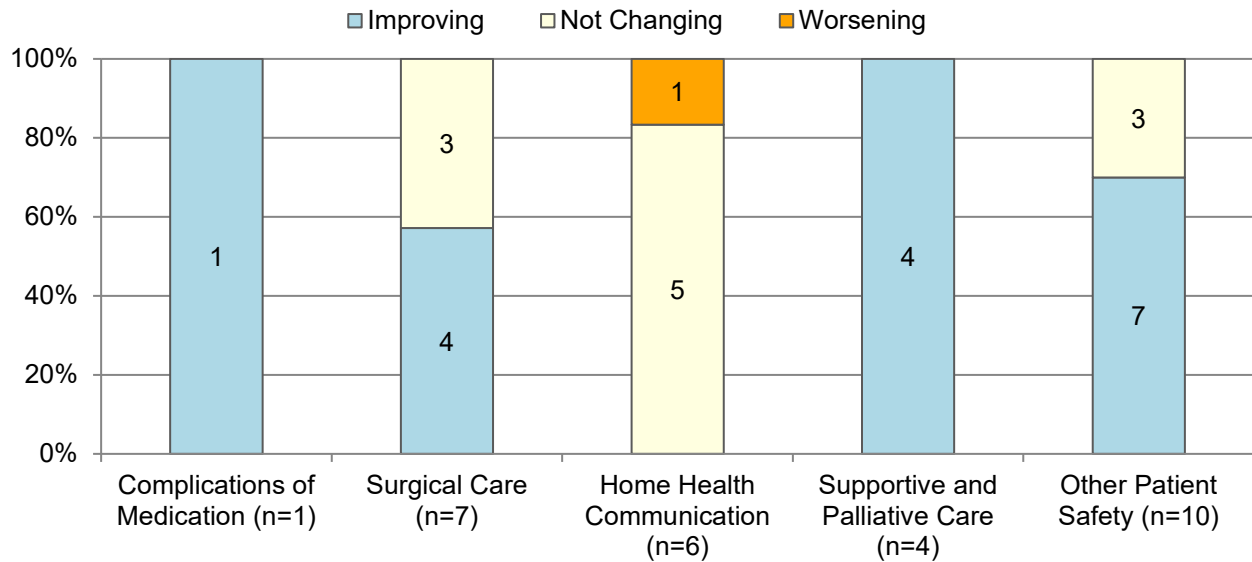
Key: n = number of measures.
Note: Among the list of surgical care measures, the chartbook lists a home health care measure in the surgical care area due to its scope. All other surgical care measures are specific to the inpatient setting.

- **Importance:** Improvement is not concentrated in one aspect of care but is spread over multiple aspects of care.
- **Findings:**

  ■ All four Supportive and Palliative Care measures were improving, as were 7 of 10 (70%) Other Patient Safety measures and the one Complications of Medication measure. Four of 7 (57%) Surgical Care measures and no Home Health Communication measures were improving.

  ■ Home Health Communication is the only area in which any measure was worsening:

  ❖ "Adults who reported a home health care provider asking to see all the prescription and over-the-counter medicines they were taking when they first started getting home health care," which declined from 78.8% in 2012 to 73.3% in 2022.

Complications of Medication:

- Improving:

  1. Home health care patients whose management of oral medications improved

Surgical Care:

- Improving:

  1. Postoperative pulmonary embolism or deep vein thrombosis per 1,000 surgical admissions, age 18 and over
  2. Postoperative respiratory failure, prolonged mechanical ventilation, or reintubation per 1,000 elective-surgery admissions, age 18 and over
  3. Postoperative acute kidney injury requiring dialysis per 1,000 elective-surgery admissions, age 18 and over
  4. Home health care patients whose surgical wound improved

- Not Changing:

  1. Perioperative hemorrhage or hematoma with surgical drainage or evacuation per 1,000 surgical admissions, age 18 and over
  2. Postoperative hip fracture per 1,000 surgical admissions who were not susceptible to falling, age 18 and over
  3. Reclosure of postoperative abdominal wound dehiscence per 1,000 abdominopelvic-surgery admissions of length 2 or more days, age 18 and over

Home Health Communication:

- Not Changing:

  1. Adults who reported a home health care provider talking with them about how to set up their home so they can move around safely when they first started getting home health care
  2. Adults who reported a home health care provider talking with them about all the prescription and over-the-counter medicines they were taking when they first started getting home health care
  3. Adults who reported that home health care providers talked with them about the purpose of taking their new or changed prescription medicines in the last 2 months of care
  4. Adults who reported that home health care providers talked with them about when to take medicines in the last 2 months of care
 5. Adults who reported that home health care providers talked with them about the side effects of medicines in the last 2 months of care

- Worsening:

  1. Adults who reported a home health provider asking to see all the prescription and over-the-counter medicines they were taking when they first started getting home health care

Supportive and Palliative Care:

- Improving:

  1. Low-risk, long-stay nursing home residents with a catheter inserted and left in the bladder
  2. Long-stay nursing home residents with a urinary tract infection
  3. Long-stay nursing home residents experiencing one or more falls with major injury
  4. Short-stay nursing home patients with pressure ulcers that are new or worsened

Other Patient Safety (detailed sub-area in parentheses):

- Improving:

  1. Postoperative sepsis per 1,000 elective-surgery admissions, age 18 and over (Healthcare-Associated Infections)
  2. Hospital admissions with central venous catheter-related bloodstream infection per 1,000 medical and surgical discharges of length 2 or more days, age 18 and over or obstetric admissions (Healthcare-Associated Infections)
  3. Hospital admissions with iatrogenic pneumothorax per 1,000 medical and surgical admissions, age 18 and over (Other Complications of Hospital Care)
  4. Deaths per 1,000 elective-surgery admissions who developed serious treatable complications of care during hospitalization, ages 18-89 or obstetric admissions (Other Complications of Hospital Care)
  5. Deaths per 1,000 hospital admissions with expected low mortality, age 18 and over or obstetric admissions (Other Complications of Hospital Care)
  6. Adults age 65 and over who received in the calendar year at least 1 of 11 prescription medications that should be avoided in older adults (Inappropriate Treatment)
  7. Adults age 65 and over who received in the calendar year at least 1 of 33 potentially inappropriate prescription medications for older adults (Inappropriate Treatment)

- Not Changing:

  1. Accidental puncture or laceration during a procedure per 1,000 medical and surgical admissions, age 18 and over (Other Complications of Hospital Care)
  2. Accidental puncture or laceration during a procedure per 1,000 medical and surgical admissions, age less than 18 years (Other Complications of Hospital Care)
  3. Birth trauma - injury to neonate per 1,000 live births

Summary of Patient Safety Trends

Improving

- Measure years are from 2002, 2013, 2014, or 2016 through 2018, 2020, 2021, or 2022.
- Improving measures are defined as average percentage changes greater than 1% per year in a favorable direction and are statistically significant. The measure of improvement is the average annual percentage change (AAPC). Rates are aligned to the negative direction, so AAPC less than −1% indicates improvement.

Of 28 measures, 16 were improving. The three measures with the largest rate of improvement are:

- Postoperative respiratory failure, prolonged mechanical ventilation, or reintubation per 1,000 elective-surgery admissions, age 18 and over (HCUP).
- Long-stay nursing home residents with a urinary tract infection (MDS).
- Short-stay nursing home patients with pressure ulcers that are new or worsened (MDS).

The remaining 13 measures from largest to smallest rate of improvement are:

- Hospital admissions with iatrogenic pneumothorax per 1,000 medical and surgical admissions, age 18 and over
- Home health care patients whose management of oral medications improved
- Hospital admissions with central venous catheter-related bloodstream infection per 1,000 medical and surgical discharges of length 2 or more days, age 18 and over or obstetric admissions
- Deaths per 1,000 hospital admissions with expected low mortality, age 18 and over or obstetric admissions
- Postoperative sepsis per 1,000 elective-surgery admissions, age 18 and over
- Postoperative acute kidney injury requiring dialysis per 1,000 elective-surgery admissions, age 18 and over
- Adults age 65 and over who received in the calendar year at least 1 of 11 prescription medications that should be avoided in older adults
- Home health care patients whose surgical wound improved
- Low-risk, long-stay nursing home residents with a catheter inserted and left in the bladder
- Adults age 65 and over who received in the calendar year at least 1 of 33 potentially inappropriate prescription medications for older adults
- Postoperative pulmonary embolism or deep vein thrombosis per 1,000 surgical admissions, age 18 and over
- Deaths per 1,000 elective-surgery admissions who developed serious treatable complications of care during hospitalization, ages 18-89 or obstetric admissions
- Accidental puncture or laceration during a procedure per 1,000 medical and surgical admissions, age less than 18 years

Not Changing

- Measure years are from 2002, 2013, 2014, or 2016 through 2018, 2020, 2021, or 2022.
- Measures not changing are defined as rates of change that are no greater than 1% per year (positive or negative) or are not statistically significant.

Of 28 measures, 11 were not changing. Of the measures not changing over time, five were questions from the CAHPS for Home Health Survey regarding communication about medication:

- Adults who reported a home health care provider talking with them about how to set up their home so they can move around safely when they first started getting home health care

- Adults who reported a home health care provider talking with them about all the prescription and over-the-counter medicines they were taking when they first started getting home health care
- Adults who reported that home health care providers talked with them about the purpose of taking their new or changed prescription medicines in the last 2 months of care
- Adults who reported that home health care providers talked with them about when to take medicines in the last 2 months of care
- Adults who reported that home health care providers talked with them about the side effects of medicines in the last 2 months of care

The remaining measures that were not changing were HCUP measures covering surgical care and maternal health:

- Perioperative hemorrhage or hematoma with surgical drainage or evacuation per 1,000 surgical admissions, age 18 and over
- Postoperative hip fracture per 1,000 surgical admissions who were not susceptible to falling, age 18 and over
- Reclosure of postoperative abdominal wound dehiscence per 1,000 abdominopelvic-surgery admissions of length 2 or more days, age 18 and over
- Accidental puncture or laceration during a procedure per 1,000 medical and surgical admissions, age 18 and over
- Accidental puncture or laceration during a procedure per 1,000 medical and surgical admissions, age less than 18 years
- Birth trauma - injury to neonate per 1,000 live births

Worsening

- Measure years are from 2002, 2013, 2014, or 2016 through 2018, 2020, 2021, or 2022.
- Worsening measures are defined as having an AAPC of more than 1% per year in an unfavorable direction and statistically significant.

Of 28 measures, only one was worsening overall:

- The percentage of adults who reported a home health care provider asking to see all the prescription and over-the-counter medicines they were taking when they first started getting home health care.

Disparities in Patient Safety

Overall Disparities

Number and percentage of patient safety measures for which members of select groups experienced better, same, or worse quality of care compared with reference group, 2019-2022
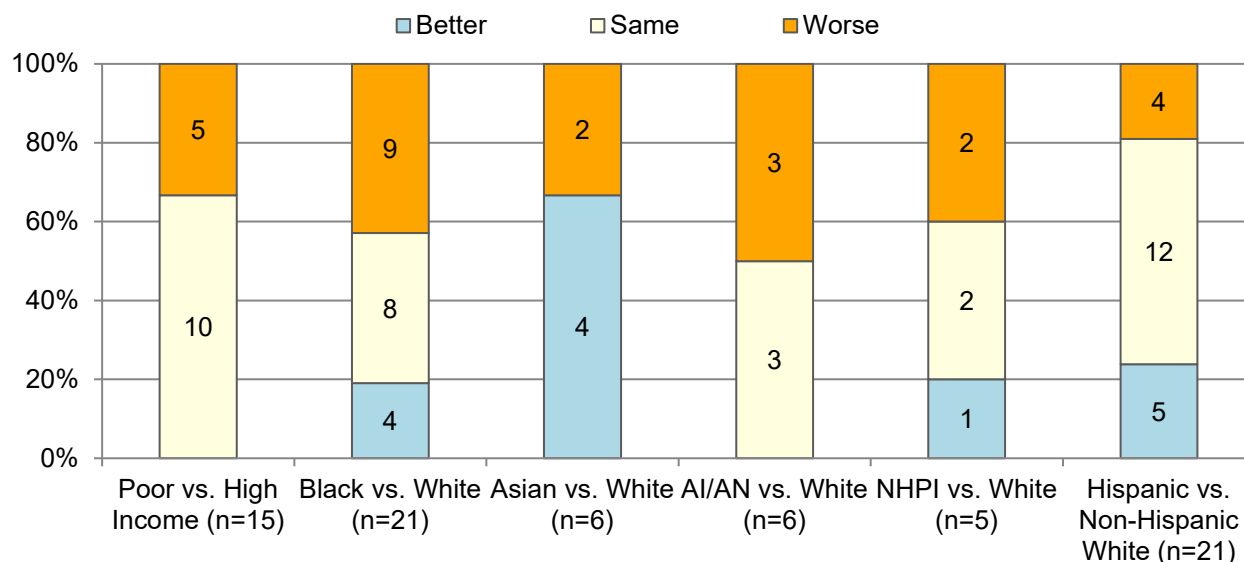
Key: AI/AN = American Indian or Alaska Native; NHPI = Native Hawaiian/Pacific Islander; n = number of measures. **Note:** Poor indicates family income less than the federal poverty guideline. High Income indicates family income four times the federal poverty guideline or greater. White, Black, Asian, AI/AN, and NHPI are non-Hispanic. Hispanic includes all races. Numbers of measures differ across groups because of data limitations. The data shown here are from 2020, 2021, and 2022. This figure reflects the most current data year available and is not limited to measures that met the criteria for conducting a trend analysis (i.e., may include fewer than four data points). The absolute and relative differences between a selected group and its reference group are used to assess disparities.

- **Better** = Selected group received better quality of care than reference group. The absolute difference is statistically significant (p <0.05) and the relative difference is equal to or larger than 10% and favors the selected group.
- **Same** = Selected group and reference group received about the same quality of care. The absolute difference is not statistically significant, or the relative difference is smaller than 10%.
- **Worse** = Selected group received worse quality of care than reference group. The absolute difference is statistically significant, and the relative difference is equal to or larger than 10% and favors the reference group.

- People in poor households received worse care than people in high-income households for one-third (33%) of patient safety measures.
- Black patients received worse care than White patients for 43% of patient safety measures.
- Asian patients received worse care than White patients for one third (33%) of patient safety measures.
- American Indians and Alaska Native (AI/AN) patients received worse care than White patients for half (50%) of patient safety measures.
- Native Hawaiian/Pacific Islander (NHPI) patients received worse care than White patients for 40% of patient safety measures.
- Hispanic patients received worse care than White patients for nearly 20% of patient safety measures.

Measure List

Poor vs. High Income:

- Same Performance:

  1. Hospital admissions with central venous catheter-related bloodstream infection per 1,000 medical and surgical discharges of length 2 or more days, age 18 and over or obstetric admissions
  2. Perioperative hemorrhage or hematoma with surgical drainage or evacuation per 1,000 surgical admissions, age 18 and over
  3. Postoperative pulmonary embolism or deep vein thrombosis per 1,000 surgical admissions, age 18 and over
  4. Postoperative hip fracture per 1,000 surgical admissions who were not susceptible to falling, age 18 and over
  5. Accidental puncture or laceration during a procedure per 1,000 medical and surgical admissions, age 18 and over
  6. Accidental puncture or laceration during a procedure per 1,000 medical and surgical admissions, age less than 18 years
  7. Hospital admissions with iatrogenic pneumothorax per 1,000 medical and surgical admissions, age 18 and over
  8. Deaths per 1,000 elective-surgery admissions who developed serious treatable complications of care during hospitalization, ages 18-89 or obstetric admissions
  9. Birth trauma - injury to neonate per 1,000 live births
  10. Adults age 65 and over who received in the calendar year at least 1 of 33 potentially inappropriate prescription medications for older adults

- Worse Performance:

  1. Postoperative sepsis per 1,000 elective-surgery admissions, age 18 and over
  2. Postoperative respiratory failure, prolonged mechanical ventilation, or reintubation per 1,000 elective-surgery admissions, age 18 and over
  3. Postoperative acute kidney injury requiring dialysis per 1,000 elective-surgery admissions, age 18 and over
  4. Reclosure of postoperative abdominal wound dehiscence per 1,000 abdominopelvic-surgery admissions of length 2 or more days, age 18 and over
  5. Deaths per 1,000 hospital admissions with expected low mortality, age 18 and over or obstetric admissions

Black vs. White:

- Better Performance:

  1. Birth trauma - injury to neonate per 1,000 live births
  2. Long-stay nursing home residents with a urinary tract infection
  3. Long-stay nursing home residents experiencing one or more falls with major injury
  4. Low-risk, long-stay nursing home residents with a catheter inserted and left in the bladder

- Same Performance:

  1. Hospital admissions with central venous catheter-related bloodstream infection per 1,000 medical and surgical discharges of length 2 or more days, age 18 and over or obstetric admissions
  2. Postoperative respiratory failure, prolonged mechanical ventilation, or reintubation per 1,000 elective-surgery admissions, age 18 and over
  3. Postoperative hip fracture per 1,000 surgical admissions who were not susceptible to falling, age 18 and over
  4. Reclosure of postoperative abdominal wound dehiscence per 1,000 abdominopelvic-surgery admissions of length 2 or more days, age 18 and over
  5. Hospital admissions with iatrogenic pneumothorax per 1,000 medical and surgical admissions, age 18 and over
  6. Deaths per 1,000 elective-surgery admissions who developed serious treatable complications of care during hospitalization, ages 18-89 or obstetric admissions
  7. Home health care patients whose management of oral medications improved
  8. Adults age 65 and over who received in the calendar year at least 1 of 33 potentially inappropriate prescription medications for older adults

- Worse Performance:

  1. Postoperative sepsis per 1,000 elective-surgery admissions, age 18 and over
  2. Perioperative hemorrhage or hematoma with surgical drainage or evacuation per 1,000 surgical admissions, age 18 and over
  3. Postoperative pulmonary embolism or deep vein thrombosis per 1,000 surgical admissions, age 18 and over
  4. Postoperative acute kidney injury requiring dialysis per 1,000 elective-surgery admissions, age 18 and over
  5. Home health care patients whose surgical wound improved
  6. Accidental puncture or laceration during a procedure per 1,000 medical and surgical admissions, age 18 and over
  7. Accidental puncture or laceration during a procedure per 1,000 medical and surgical admissions, age less than 18 years
  8. Deaths per 1,000 hospital admissions with expected low mortality, age 18 and over or obstetric admissions
  9. High-risk, long-stay nursing home patients with stages 2-4 pressure ulcer or unstageable pressure ulcer

Asian vs. White Disparities:
- Better Performance:

  1. High-risk, long-stay nursing home residents with pressure ulcer
  2. Low-risk, long-stay nursing home residents with a catheter inserted and left in the bladder
  3. Long-stay nursing home residents with a urinary tract infection
  4. Long-stay nursing home residents experiencing one or more falls with major injury

- Worse Performance:

  1. Home health care patients whose surgical wound improved
  2. Home health care patients whose management of oral medications improved

AI/AN vs. White Disparities:
- Same Performance:

  1. Low-risk, long-stay nursing home residents with a catheter inserted and left in the bladder
  2. Long-stay nursing home residents with a urinary tract infection
  3. Long-stay nursing home residents experiencing one or more falls with major injury

- Worse Performance:

  1. Home health care patients whose surgical wound improved
  2. Home health care patients whose management of oral medications improved
  3. High-risk, long-stay nursing home patients with pressure ulcer

NHPI vs. White Disparities:
- Better Performance:

  1. Long-stay nursing home residents with a urinary tract infection

- Same Performance:

  1. High-risk, long-stay nursing home patients with stages 2-4 pressure ulcer or unstageable pressure ulcer
  2. Low-risk, long-stay nursing home residents with a catheter inserted and left in the bladder

- Worse Performance:

  1. Home health care patients whose surgical wound was improved
  2. Home health care patients whose management of oral medications improved

Hispanic vs. White Disparities:
- Better Performance:

  1. Perioperative hemorrhage or hematoma with surgical drainage or evacuation per 1,000 surgical admissions, age 18 and over
  2. Birth trauma - injury to neonate per 1,000 live births
  3. Adults age 65 and over who received in the calendar year at least 1 of 33 potentially inappropriate prescription medications for older adults
  4. Long-stay nursing home residents with a urinary tract infection
  5. Long-stay nursing home patients experiencing one or more falls with major injury

- Same Performance:

  1. Hospital admissions with central venous catheter-related bloodstream infection per 1,000 medical and surgical discharges of length 2 or more days, age 18 and over or obstetric admissions
  2. Postoperative pulmonary embolism or deep vein thrombosis per 1,000 surgical admissions, age 18 and over
  3. Postoperative respiratory failure, prolonged mechanical ventilation, or reintubation per 1,000 elective-surgery admissions, age 18 and over
  4. Postoperative acute kidney injury requiring dialysis per 1,000 elective-surgery admissions, age 18 and over
  5. Postoperative hip fracture per 1,000 surgical admissions who were not susceptible to falling, age 18 and over
  6. Accidental puncture or laceration during a procedure per 1,000 medical and surgical admissions, age 18 and over
  7. Accidental puncture or laceration during a procedure per 1,000 medical and surgical admissions, age less than 18 years
  8. Hospital admissions with iatrogenic pneumothorax per 1,000 medical and surgical admissions, age 18 and over
  9. Deaths per 1,000 elective-surgery admissions who developed serious treatable complications of care during hospitalization, ages 18-89 or obstetric admissions
  10. Deaths per 1,000 hospital admissions with expected low mortality, age 18 and over or obstetric admissions
  11. High-risk, long-stay nursing home patients with stages 2-4 pressure ulcer or unstable pressure ulcer
  12. Low-risk, long-stay nursing home residents with a catheter inserted and left in the bladder

- Worse Performance:

  1. Postoperative sepsis per 1,000 elective-surgery admissions, age 18 and over
  2. Reclosure of postoperative abdominal wound dehiscence per 1,000 abdominopelvic-surgery admissions of length 2 or more days, age 18 and over
  3. Home health care patients whose surgical wound improved
  4. Home health care patients whose management of oral medications improved

Trends in Disparities

Trends in disparities over time are only examined when a disparity existed in the earliest year of data available. Trends are assessed using unweighted regression. The average annual change (AAC) is computed for the selected group and the reference group. The difference between the AAC for the selected group and the AAC for the reference group is calculated and its statistical significance is assessed ($p < 0.10$). Rates are aligned so that change in the positive direction indicates improvement:

- **Improving:** The baseline disparity is shrinking. The difference in AAC is greater than 1 and is statistically significant.

- **No change:** The baseline disparity is not changing. The difference in AAC is between −1 and 1 or is not statistically significant.
- **Worsening:** The baseline disparity is becoming larger. The difference in AAC is less than −1 and is statistically significant.

No patient safety measure had worsening disparities over time. Four were improving.

Forty-one subgroup comparisons across 23 measures did not show any change over time, including the following examples:

- **Race.** Black vs. White: High-risk, long-stay nursing home patients with stages 2-4 pressure ulcer or unstageable pressure ulcer.
- **Age.** 34-54 years vs. 18-24 years: Obstetric trauma per 1,000 vaginal deliveries without instrument assistance.
- **Sex.** Female vs. Male: Adults age 65 and over who received in the calendar year at least 1 of 33 potentially inappropriate prescription medications for older adults.

Measures of Patient Safety

Individual measures are presented by the setting in which care was provided:

- Hospitals
- Ambulatory care
- Nursing homes
- Home health care
- Infrastructure: Ambulatory surgery centers and medical offices

Select patient safety measure results are presented overall and by age, sex, race, ethnicity, health status, or presence of various health conditions. Measures presented in the summary analyses are core measures only. All other patient safety measures presented for the various settings are supplemental measures.

Patient Safety in the Hospital Setting

To date, patient safety research has more closely examined adverse events and quality improvement activities implemented in hospital settings.

In this section, measures address:

- Healthcare-associated infections (HAIs).
- Maternal morbidity and mortality measures.
- Adverse drug events.

Healthcare-Associated Infections

Infections acquired during a hospital stay are among the most common complications of hospital care (AHRQ, 2019c). On any given day, about 1 in 31 hospital patients has at least one HAI (Magill, et al., 2018). HAIs often increase patients' length of stay in the hospital, risk of death, and hospital costs. New infections in critically ill infants, children, and other patients generally reduce their chances for recovery.

More information is available from the HAI and Antibiotic Use Prevalence Survey, https://www.cdc.gov/hai/eip/antibiotic-use.html.

A common measure of HAIs is the standardized infection ratio (SIR). SIRs compare the observed numbers of specific types of infections with the numbers of infections predicted:

- The predicted numbers are based on various healthcare facility and patient population characteristics.
- SIRs are calculated based on infections that healthcare facilities report to the Centers for Disease Control and Prevention (CDC) National Healthcare Safety Network (NHSN) during a year.

SIRs facilitate comparative evaluations of hospital risk-adjusted performance. They were determined as follows:

- For various infections, CDC established baseline predicted infection rates using data from 2006-2011. They later established new baselines using 2015 data. Therefore, almost all 2015 national SIRs for various HAI types are very close to 1.0, and trends involving SIRs from previous years cannot be examined.
- NHSN data had been predominantly from intensive care units, although general medical/surgical inpatient wards and other non-critical care locations are also increasingly represented. The numbers of units/facilities reporting to NHSN roughly quadrupled from 2009 to 2014.
- Statewide SIRs with 95% confidence intervals entirely above 1.0 indicate that, on average, a given state's hospitals had more HAIs of a specific type than hospitals of similar type and size had reported during the baseline period. Conversely, statewide SIRs with 95% confidence intervals entirely below 1.0 indicate that the state's hospitals generally had fewer HAIs of that type than hospitals of similar type and size had reported during the baseline period.
- Statewide SIRs with 95% confidence intervals that included 1.0 indicated that their hospitals had roughly the same number of infections (e.g., catheter-associated urinary tract infections) as hospitals of similar type and size had reported during the referent period.

Standardized Infection Ratios for Specific HAIs

This chartbook presents the following measures related to HAIs:

- Distributions of state-specific SIRs for central line-associated bloodstream infections (CLABSIs) and NHSN-defined catheter-associated urinary tract infections (CAUTIs)

  - Restricted to acute care hospitals
  - Stratified by unit type

- Distributions of state-specific SIRs for hospital-onset *Clostridioides difficile* (*C. difficile*) infections seen in acute care hospitals

SIRs were calculated for all 50 states, District of Columbia, and Puerto Rico. Statewide SIRs were classified as:

- Below 1.0 if the 95% confidence intervals bounding the SIR point estimates were entirely below 1.0.
- Around 1.0 if the 95% confidence intervals bounding the SIR point estimates included 1.0.
- Above 1.0 if the 95% confidence intervals bounding the SIR point estimates were entirely above 1.0.

The following measures are organized by:

- Infection type: CLABSI, CAUTI, or *C. difficile.*
- Where data were collected: critical care units vs. wards.
- Summary level: National SIR, statewide SIR.

A CLABSI is a laboratory-confirmed bloodstream infection (LCBI) where a central line (CL) or umbilical catheter (UC) was in place for >2 calendar days on the date of event, with day of device placement being Day 1 and the line also being in place on the date of event or the day before. If a CL or UC was in place for >2 calendar days and then removed, the date of event of the LCBI must be the day of discontinuation or the next day to be a CLABSI (CDC, 2021).

CAUTIs in the hospital setting are caused by instrumentation of the urinary tract (CDC, 2023). Potential complications resulting from the development of CAUTI include cystitis, pyelonephritis, endocarditis, septic arthritis, and meningitis. NHSN defines CAUTIs based on symptomatic urinary tract infection, asymptomatic bacteremic UTI, or urinary system infection criteria and using specific criteria related to the timing of catheter use and CAUTI diagnosis.

These criteria, which differ from those used by QSRS, can be found at https://www.cdc.gov/nhsn/pdfs/pscmanual/7psccauticurrent.pdf.

C. difficile is a bacterium that can cause potentially fatal diarrhea. *C. difficile* infections are often associated with the use of antibiotics prescribed for other reasons that alter the balance of intestinal bacteria. NHSN defines hospital-onset *C. difficile* infections as those detected on the 4th day or later after admission to an inpatient location.

Infections counted for SIRs are restricted to acute care hospitals (excluding critical access hospitals, long-term acute care hospitals, and inpatient rehabilitation facilities) and are stratified by unit type:

- Critical care units (excluding neonatal intensive care units)
- General hospital wards

Data were submitted to NHSN by hospitals in all 50 states, District of Columbia, Guam, Puerto Rico, and the U.S. Virgin Islands. SIRs were not calculated for states or territories with fewer than five facilities reporting data.

Guam and the Virgin Islands had too few hospitals for the calculation of state-level SIRs for any of the measures presented here. For the same reason, SIRs were not calculated for Vermont in 2017 or 2018 for "Central line-associated bloodstream infections seen in critical care units" and "Catheter-associated urinary tract infections seen in critical care units." Puerto Rico was not included in any year for "Hospital-onset *Clostridioides difficile* infections seen hospital-wide." In all years, however, data received from all states and all of the listed territories were included in the calculation of the U.S. national SIR.

NHSN calculated SIRs (and their 95% confidence intervals) for 52 individual state-equivalent jurisdictions (50 states plus District of Columbia and Puerto Rico). However, some state-level SIRs were based on small numbers (i.e., <50) of observed or predicted site-specific infections. Therefore, SIRs are displayed for the entire United States or are summarized by whether the state SIRs were above, around, or below 1.0 and are aggregated across the entire country or by the U.S. census region.

COVID-19 Impact on Data for Patient Safety in the Hospital Setting: HAIs

Due to the COVID-19 public health emergency, CMS made optional and temporarily excepted reporting of data for NHSN HAI measures. This exception applies to data for quarter 4 of 2019 and quarters 1 and 2 of 2020. For more information on the impact of the COVID-19 public health emergency on data collection and analysis, view the CMS Extraordinary Circumstance Exceptions Policy.

Infection Ratios for Central-Line Associated Bloodstream Infections

National SIR for central line-associated bloodstream infections seen in critical care units and wards (non-critical care units), 2015-2021
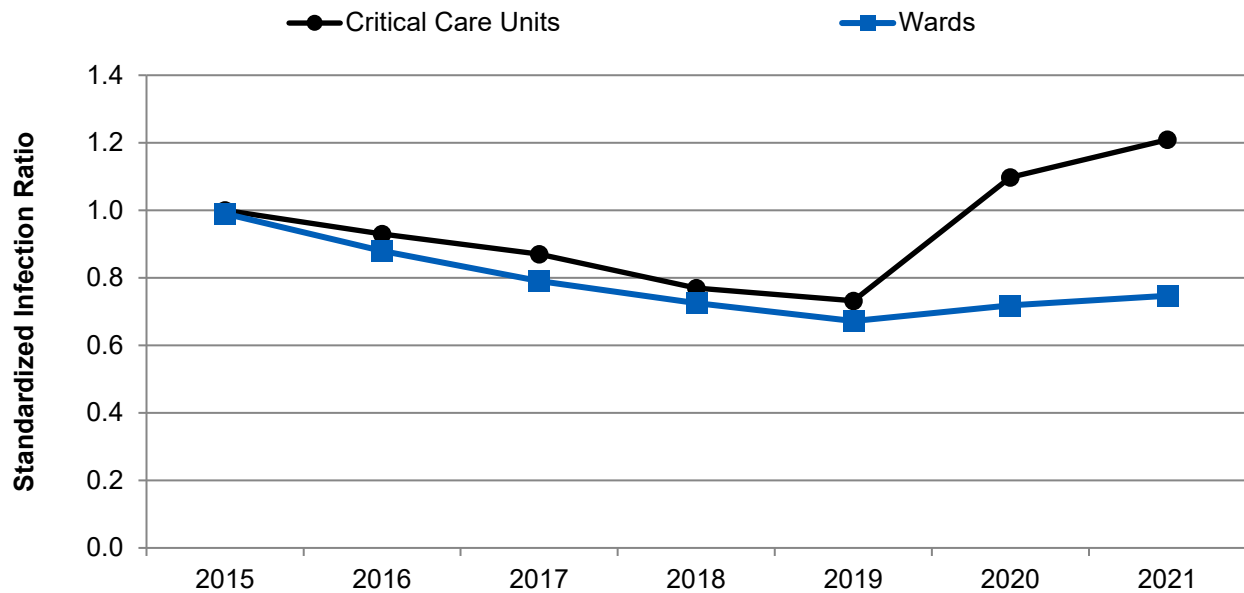
Source: Centers for Disease Control and Prevention, National Center for Emerging and Zoonotic Infectious Diseases, National and State Healthcare-Associated Infections Data Report, 2015-2021. https://www.cdc.gov/hai/data/portal/progress-report.html.
Note: SIRs below 1.0 are better.

- **Importance:** Primary bloodstream infections associated with a central venous catheter account for approximately 8.3% of HAIs in acute care hospitals (Magill, et al., 2014). In addition, CLABSI SIRs are higher among critical care units than among non-critical care wards (CDC, 2021).
- **Findings:** In 2021, the CLABSI SIR was 1.21 in critical care units and 0.75 in wards. The 95% confidence intervals for all years follow:

  - Critical care units:

    - ❖ 2015, 0.981-1.021
    - ❖ 2016, 0.912-0.950
    - ❖ 2017, 0.848-0.885
    - ❖ 2018, 0.752-0.788
    - ❖ 2019, 0.715-0.750
    - ❖ 2020, 1.077-1.119
    - ❖ 2021, 1.189-1.229

  - Wards:

    - ❖ 2015, 0.976-1.009
    - ❖ 2016, 0.861-0.892
    - ❖ 2017, 0.773-0.802
    - ❖ 2018, 0.711-0.739

❖ 2019, 0.659-0.685
❖ 2020, 0.704-0.732
❖ 2021, 0.733-0.760

State-Specific Infection Ratios for CLABSIs in Critical Care Units

State-specific distribution of SIRs for central line-associated bloodstream infections seen in critical care units by state, 2015-2021 (left to right, top to bottom)
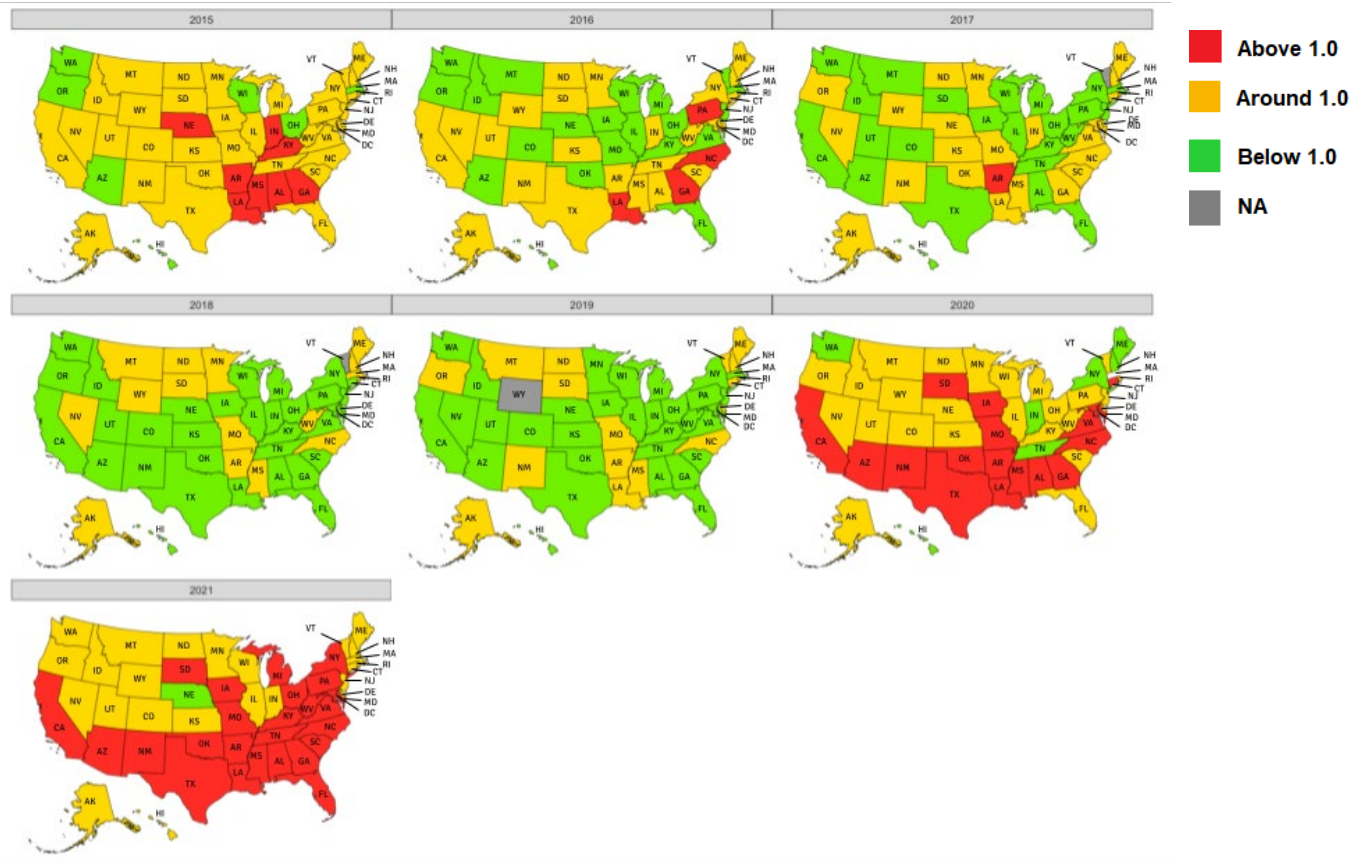
Source: Centers for Disease Control and Prevention, National Center for Emerging and Zoonotic Infectious Diseases, National and State Healthcare-Associated Infections Data Report, 2015-2021. https://www.cdc.gov/hai/data/portal/progress-report.html.
Note: SIRs below 1.0 are better. Vermont did not have data available for this measure in 2017 or 2018, reducing the overall number of state-equivalent jurisdictions in the analysis from 52 to 51. Wyoming did not have data available for 2019.

- For CLABSIs seen in critical care units of acute care hospitals in 2021:

  ■ State-specific SIRs ranged from 0.59 (minimum) to 2.86 (maximum).

State-Specific Distribution of Infection Ratios for CLABSIs in Wards

State-specific distribution of SIRs for central line-associated bloodstream infections seen on wards (non-critical care units) by state, 2015-2021 (left to right, top to bottom)
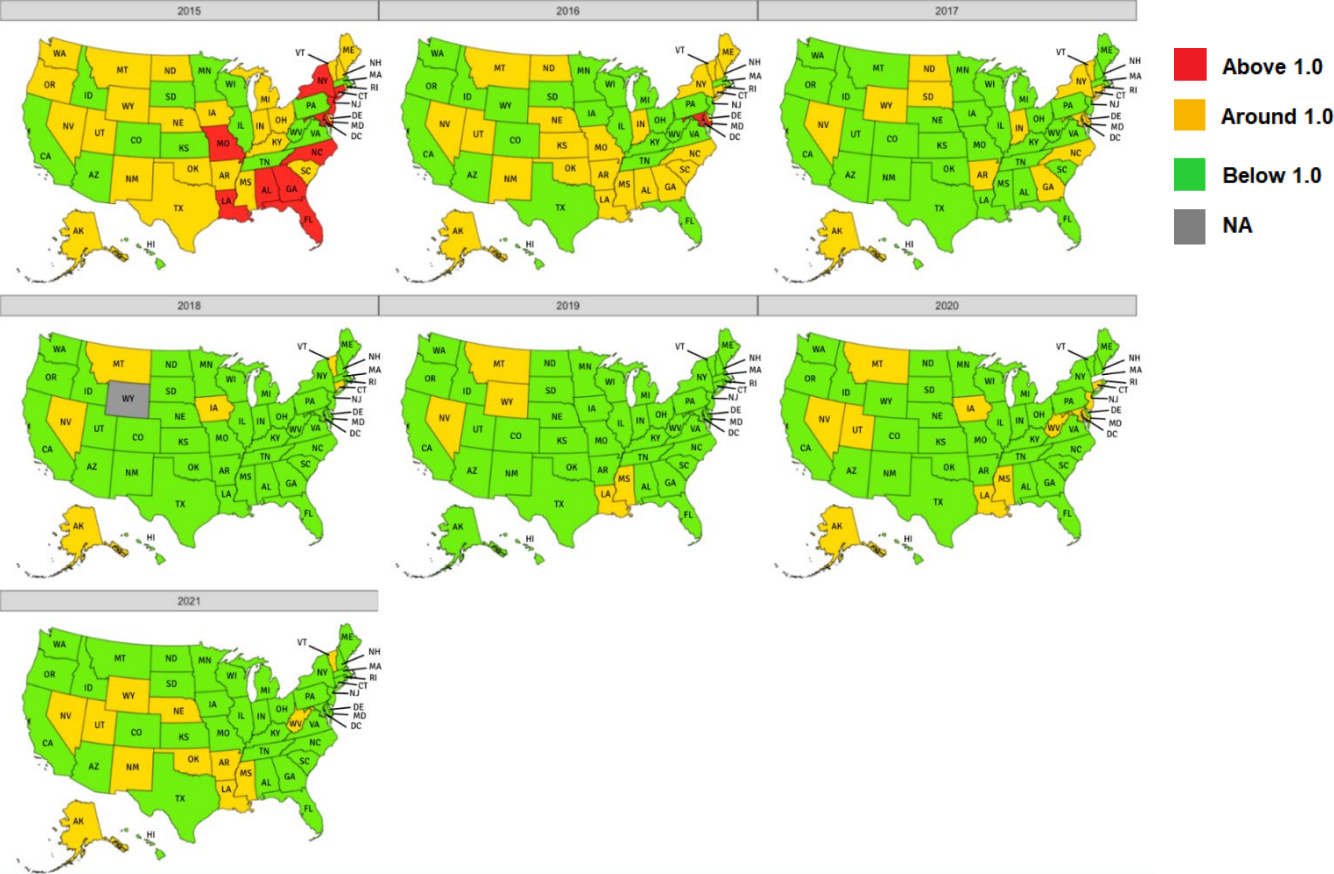
Source: Centers for Disease Control and Prevention, National Center for Emerging and Zoonotic Infectious Diseases, National and State Healthcare-Associated Infections Data Report, 2015-2021. https://www.cdc.gov/hai/data/portal/progress-report.html.
Note: SIRs below 1.0 are better. Wyoming did not have data available for 2018.

- For CLABSIs seen in non-critical care units of acute care hospitals in 2021:

  - State-specific SIRs ranged from 0.44 (minimum) to 1.2 (maximum).

Standardized Infection Ratios for Catheter-Associated Urinary Tract Infections

National SIR for catheter-associated urinary tract infections seen in critical care units and wards (non-critical care units), 2015-2021

Source: Centers for Disease Control and Prevention, National Center for Emerging and Zoonotic Infectious Diseases, National and State Healthcare-Associated Infections Data Report, 2015-2021.
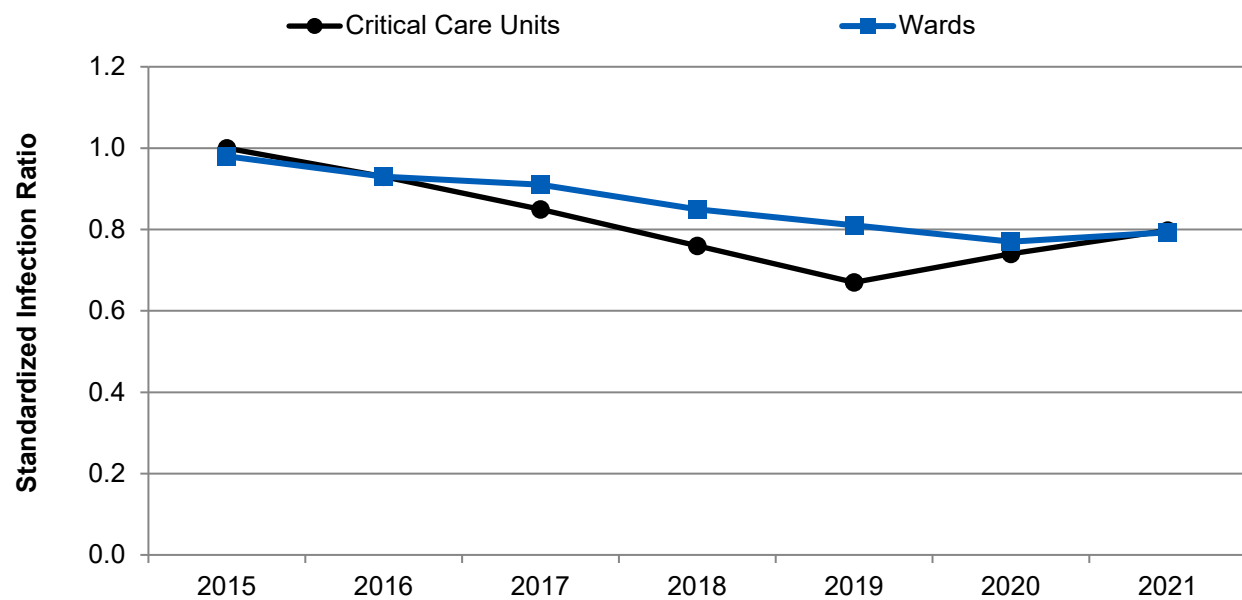https://www.cdc.gov/hai/data/portal/progress-report.html.
Note: SIRs below 1.0 are better.

- **Importance:** Compared with rates of other hospital-acquired infections, CAUTI rates vary more among units in the same hospital (Dudeck, et al., 2015). Intensive care unit (ICU) patients differ from non-ICU patients in their underlying health status, their risks of contracting CAUTIs, and the consequences of CAUTIs that occur.
- **Findings:** In 2021, the CAUTI SIR was 0.80 in critical care units and 0.79 in wards. The 95% confidence intervals for all years follow:

  - Critical care units:

    - 2015, 0.986-1.019
    - 2016, 0.911-0.943
    - 2017, 0.834-0.866
    - 2018, 0.748-0.778
    - 2019, 0.656-0.684
    - 2020, 0.721-0.750
    - 2021, 0.784-0.812

  - Wards:

    - 2015, 0.969-1.000
    - 2016, 0.918-0.949
    - 2017, 0.893-0.924
    - 2018, 0.836-0.867

❖ 2019, 0.792-0.822
  ❖ 2020, 0.758-0.788
  ❖ 2021, 0.779-0.907

State-Specific Infection Ratios for CAUTIs in Critical Care Units

State-specific distributions of SIRs for catheter-associated urinary tract infections seen in critical care units, 2015-2021 (left to right, top to bottom)
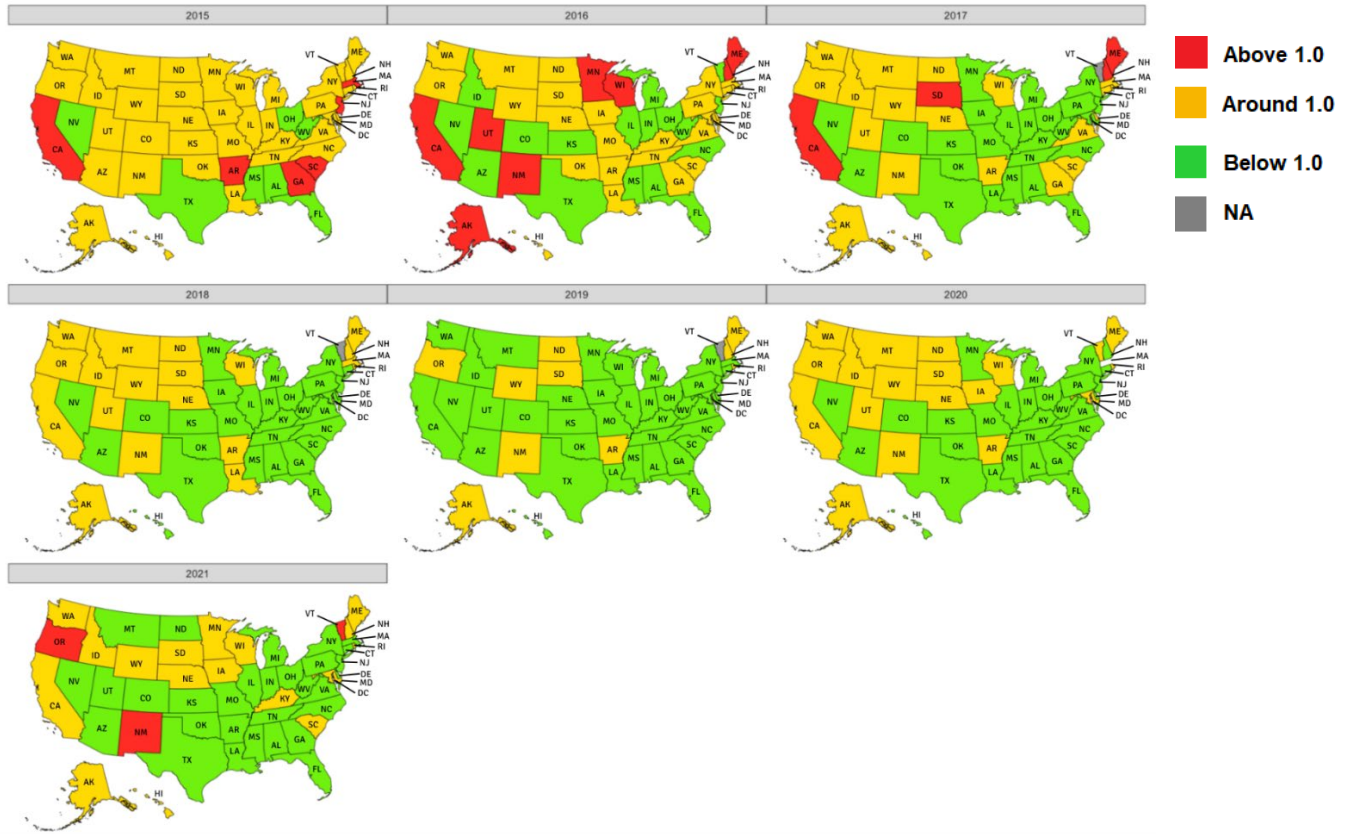
Source: Centers for Disease Control and Prevention, National Center for Emerging and Zoonotic Infectious Diseases, National and State Healthcare-Associated Infections Data Report, 2015-2021. https://www.cdc.gov/hai/data/portal/progress-report.html.
Note: SIRs below 1.0 are better. The SIR for Vermont was not calculated for this measure in 2017, 2018, or 2019, reducing the overall number of state-equivalent jurisdictions in the analysis from 52 to 51 for 2017, 2018, and 2019.

- For CAUTIs seen in critical care units of acute care hospitals in 2021:

  ■ State-specific SIRs ranged from 0.36 (minimum) to 1.71 (maximum).

State-Specific Distribution of Infection Ratios for CAUTIs in Wards

State-specific distributions of SIRs for catheter-associated urinary tract Infections seen on wards (non-critical care units), 2015-2021 (left to right, top to bottom)

Source: Centers for Disease Control and Prevention, National Center for Emerging and Zoonotic Infectious Diseases, National and State Healthcare-Associated Infections Data Report, 2015-2021.
https://www.cdc.gov/hai/data/portal/progress-report.html.
Note: SIRs below 1.0 are better.

- For CAUTIs seen on wards (non-critical care units) of acute care hospitals in 2021:

  - State-specific SIRs ranged from 0.0.38 (minimum) to 1.86 (maximum).

Nationwide Infection Ratio for Clostridioides difficile

National SIR for hospital-onset Clostridioides difficile infections seen hospital-wide, 2015-2021
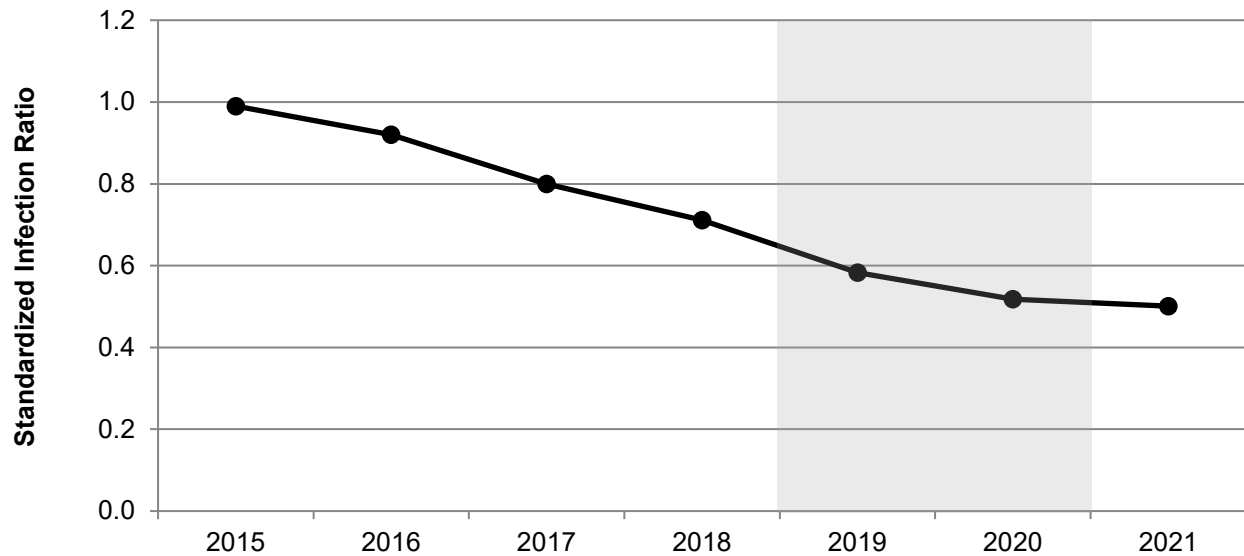
Source: Centers for Disease Control and Prevention, National Center for Emerging and Zoonotic Infectious Diseases, National and State Healthcare-Associated Infections Data Report, 2015-2021. https://www.cdc.gov/hai/data/portal/progress-report.html.
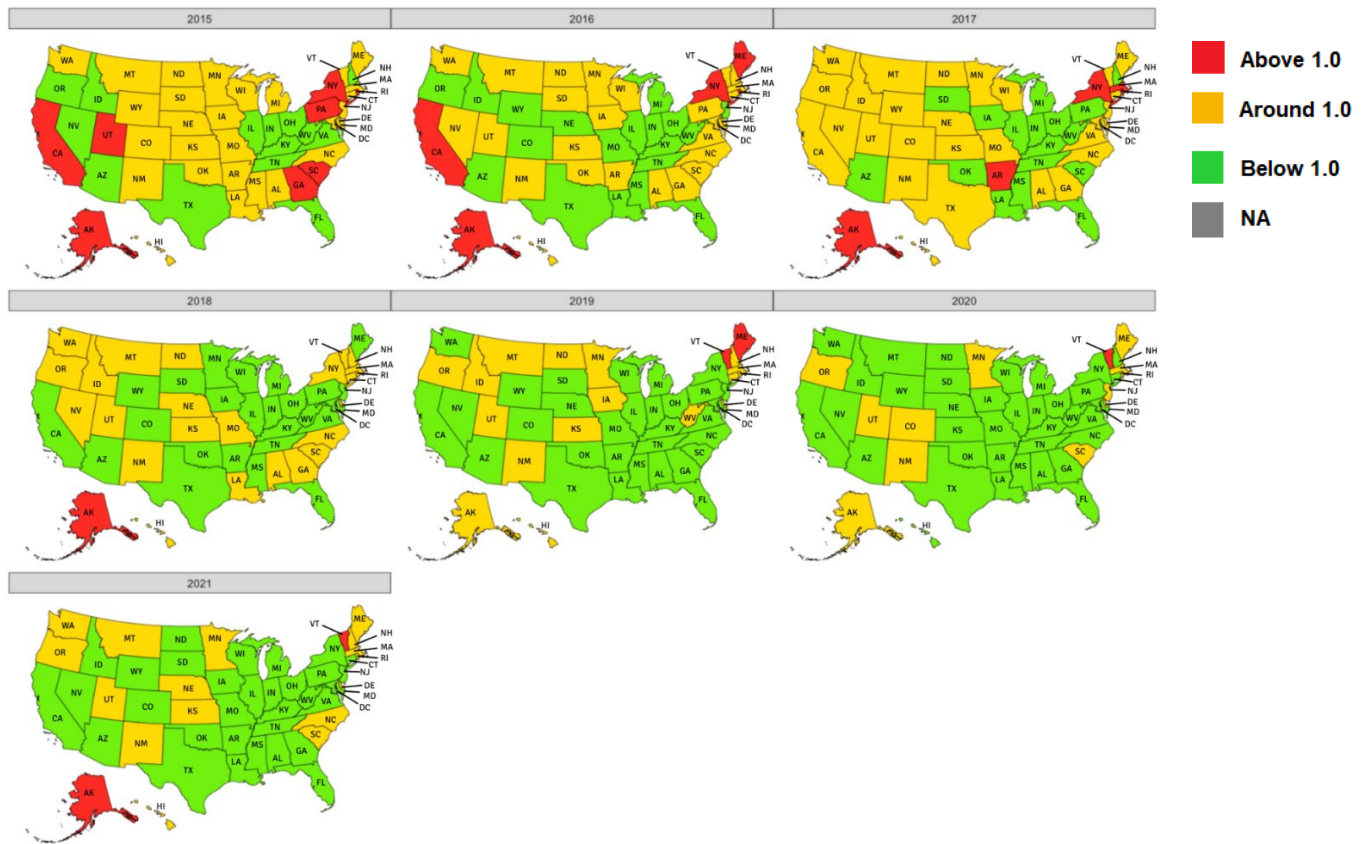**Note:** SIRs below 1.0 are better. Shaded area indicates data impacted by the COVID-19 public health emergency.

- **Findings:** In 2021, the national *C. difficile* SIR was 0.518 hospitalwide. The 95% confidence intervals for all years follow:

  - 2015, 0.987-0.999
  - 2016, 0.915-0.926
  - 2017, 0.799-0.810
  - 2018, 0.706-0.716
  - 2019, 0.578-0.587
  - 2020, 0.513-0.523
  - 2021, 0.496-0.505

State-Specific Infection Ratios for C. difficile

State-specific distributions of SIRs for hospital-onset *Clostridioides difficile* infections seen hospitalwide, 2015-2021 (left to right, top to bottom)

Source: Centers for Disease Control and Prevention, National Center for Emerging and Zoonotic Infectious Diseases, National and State Healthcare-Associated Infections Data Report, 2015-2021.
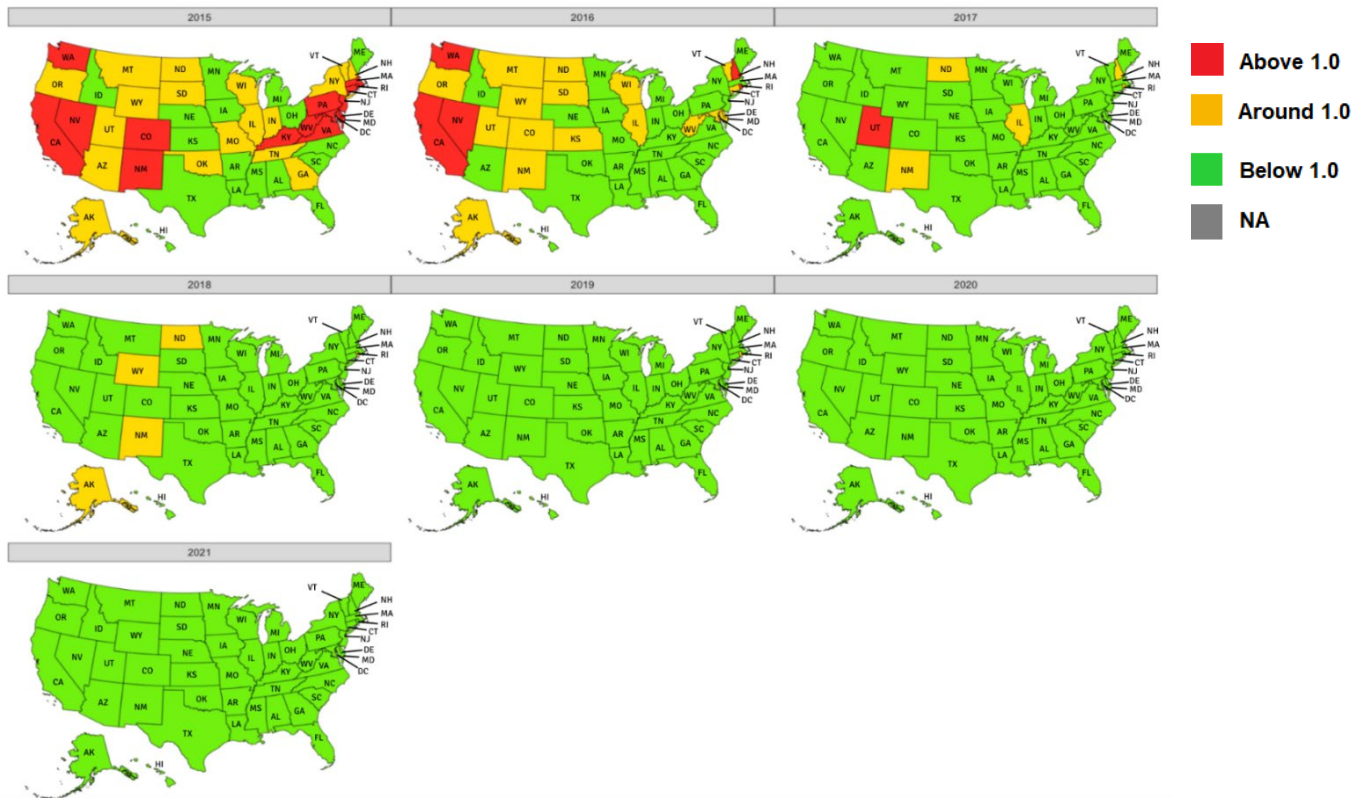https://www.cdc.gov/hai/data/portal/progress-report.html.
Note: SIRs below 1.0 are better.

- For hospital-onset *C. difficile* infection seen anywhere in the hospital in 2021:

    - State-specific SIRs ranged from 0.11 (minimum) to 0.73 (maximum).

Postoperative Sepsis, by Age

Postoperative sepsis per 1,000 elective-surgery admissions, age 18 and over, by age, 2016-2020
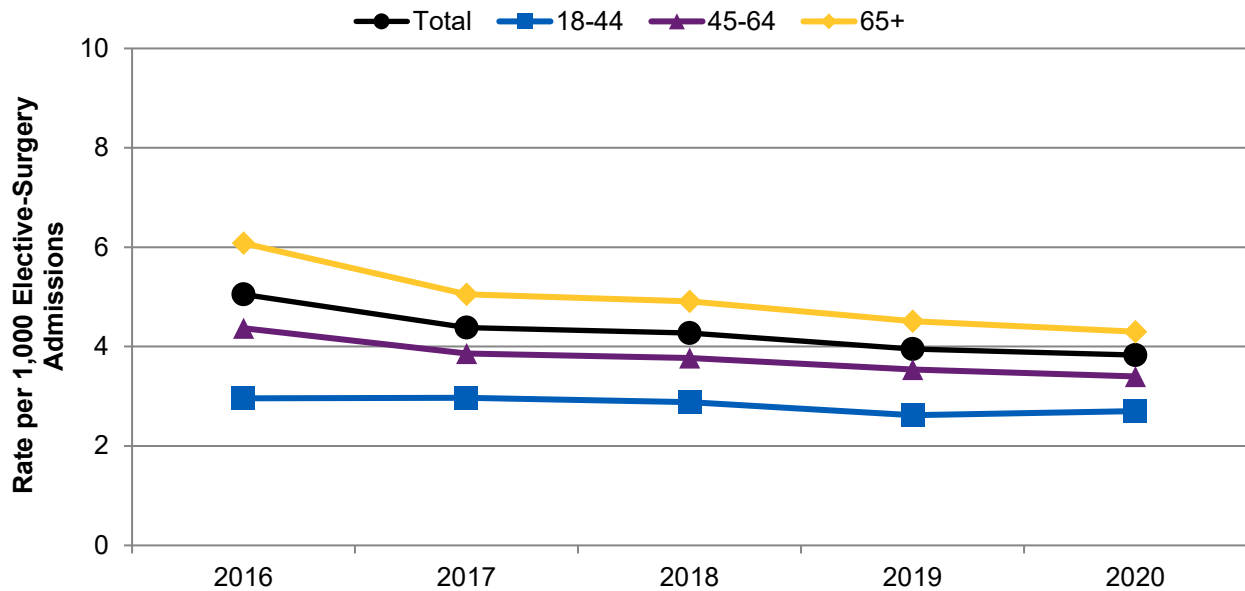
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID), weighted to provide national estimates; and the AHRQ Quality Indicators, v2022.0. For more information, see the HCUP Methods Series Report on Methods Applying AHRQ Quality Indicators to HCUP Data (https://www.hcup-us.ahrq.gov/reports/methods/methods.jsp).
Note: For this measure, lower rates are better.

- **Overall Percentage:** In 2020, adult patients experienced postoperative sepsis following elective-surgery admission at a rate of 3.83 per 1,000 elective-surgery admissions.
- **Groups With Disparities, 2020:**

  - Patients 65 and over experienced higher rates of postoperative sepsis compared with patients ages 18-44 (4.3 vs. 2.7 per 1,000 elective-surgery admissions).

Postoperative Sepsis, by Race/Ethnicity

Postoperative sepsis per 1,000 elective-surgery admissions, age 18 and over, by race/ethnicity, 2016-2020

Key: API = Asian or Pacific Islander.
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID), weighted to provide national estimates; and the AHRQ Quality Indicators, v2022.0. For more information, see the HCUP Methods Series Report on Methods Applying AHRQ Quality Indicators to HCUP Data (https://www.hcup-us.ahrq.gov/reports/methods/methods.jsp)
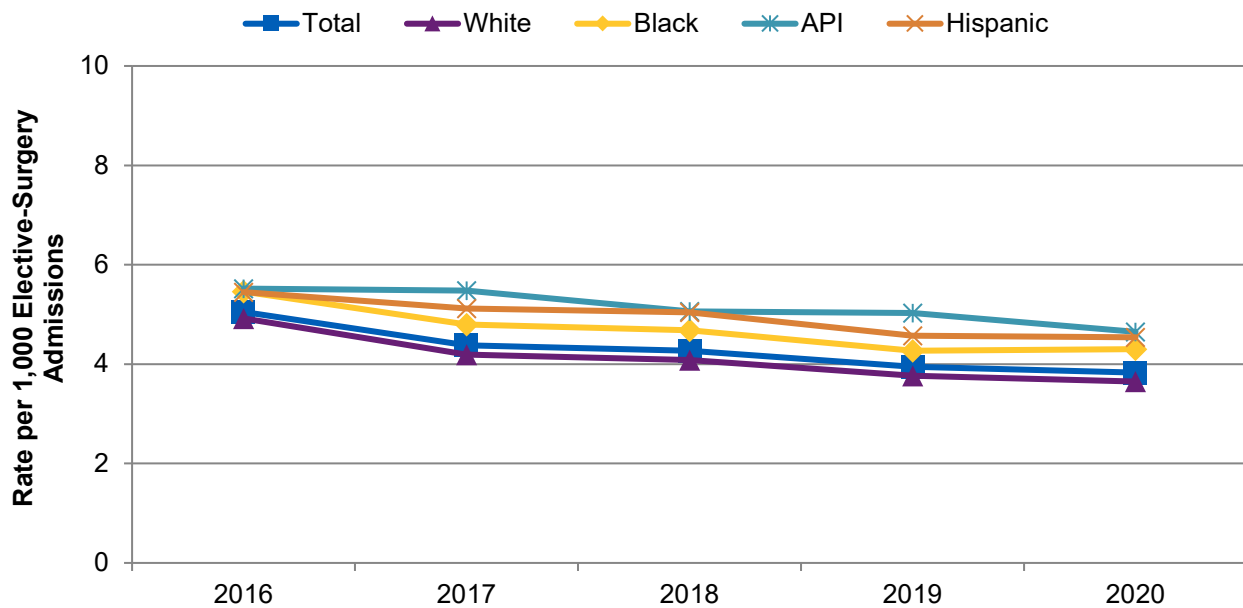**Note:** For this measure, lower rates are better. White, Black, and API are non-Hispanic. Hispanic includes all races.

- **Groups With Disparities, 2020:**

    - Asian and Pacific Islander (API) patients experienced higher rates of postoperative sepsis compared with White patients (4.7 vs. 3.7 per 1,000 elective-surgery admissions).

Tools for Reducing Central Line-Associated Bloodstream Infections in Hospitals

- **Purpose:** To help hospitals prevent CLABSIs and improve safety culture
- **Methods:**

    - Implementing evidence-based practical resources and concepts from the Comprehensive Unit-based Safety Program (CUSP)

        - ❖ Link: https://www.ahrq.gov/hai/tools/clabsi-cauti-icu/index.html and https://www.ahrq.gov/hai/clabsi-tools/index.html

    - Implementing targeted decolonization for non-ICU patients with indwelling medical devices

        - ❖ Link: https://www.ahrq.gov/hai/tools/abate/index.html

- **Intended Users:** Hospital facilities
- **Available Tools:** Checklists, preventable incidence calculators, audit forms, event report templates
- **Potential Measures of Effectiveness:**

  - Number of CLABSIs attributable to each unit per month
  - Days since last CLABSI

- **Impact:** Through use of the CUSP toolkit and CLABSI tools, more than 100 hospital ICUs in Michigan nearly eliminated CLABSIs. Nationwide, the use of this toolkit helped more than 1,100 hospital ICUs reduce rates of CLABSI by 40% in aggregate. For an example, refer to https://www.ahrq.gov/news/newsroom/case-studies/202202.html.

Tools for Reducing Catheter-Associated Urinary Tract Infections in Hospitals

- **Purpose:** To help hospitals prevent CAUTIs and improve safety culture
- **Methods:** Implementing evidence-based, practical resources and concepts from the Comprehensive Unit-based Safety Program (CUSP)
- **Intended Users:** Hospital facilities
- **Available Tools**: Guides, checklists, webinars, learning modules, data interpretation guides
- **Link:** https://www.ahrq.gov/hai/tools/clabsi-cauti-icu/index.html
- **Potential Measures of Effectiveness:**

  - Number of symptomatic CAUTIs attributable to each unit per month
  - Days since last CAUTI

- **Impact:** Use of the CUSP for CAUTI toolkit helped more than 700 hospital non-ICU units reduce rates of CAUTI by 30%.

Maternal Morbidity and Mortality

Maternal mortality, defined as the risk of dying from causes associated with childbirth, is considered a sentinel event in that it is a rare and negative maternal outcome (Adams, et al., 2009). The United States has one of the highest maternal mortality rates compared with other high-income industrialized countries, with 17.4 deaths per 100,000 live births in 2018 (CDC, 2020a).

About 700 women die from pregnancy-related complications annually. One-third of pregnancy-related deaths occur 1 week to 1 year after delivery. Three in five pregnancy-related deaths are preventable (Petersen, et al., 2019).

Persistent racial and ethnic disparities in maternal mortality have also accompanied the rise in maternal deaths. Black women have a pregnancy-related mortality rate 3 times as high as that of non-Hispanic White women (Petersen, et al., 2019).

Like maternal mortality, severe maternal morbidity, which encompasses unintended outcomes of labor and delivery that result in short-term or long-term health issues, has increased in the United States in recent decades (ACOG, Kilpatrick, & Ecker, 2016).
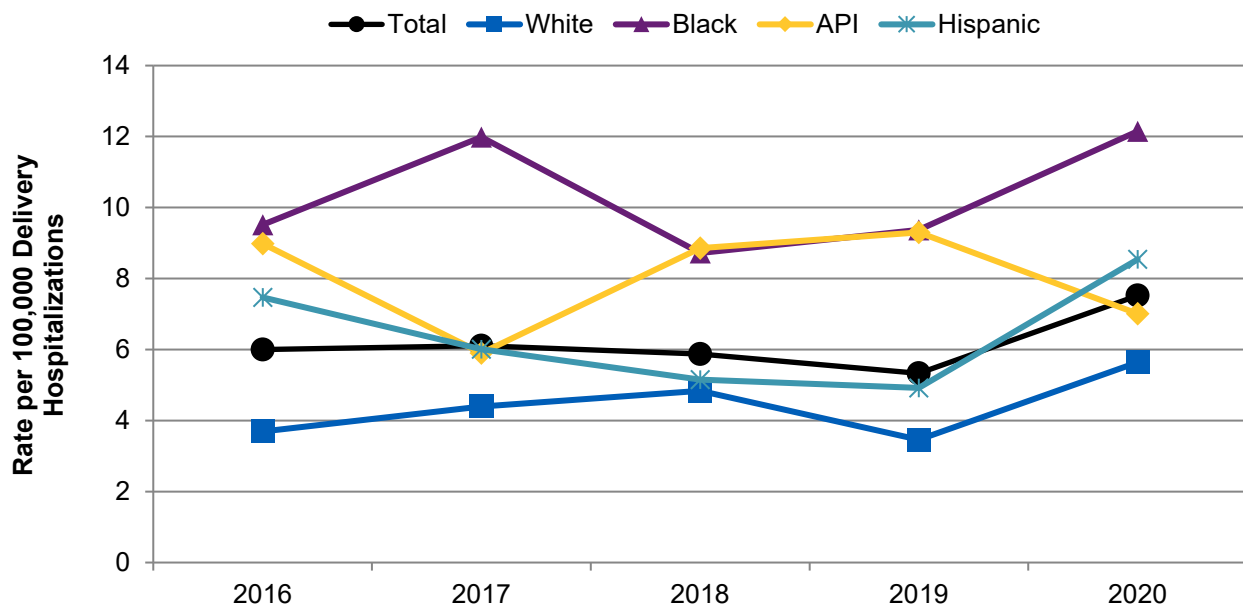
Many cases of maternal morbidity and mortality are potentially preventable. Factors that contribute to these events have been categorized at the patient, provider, health facility, and system level (Petersen, et al., 2019).

Maternal morbidity and mortality measures include:

- In-hospital deaths per 100,000 delivery hospitalizations.
- Severe maternal morbidity per 1,000 delivery hospitalizations.
- Severe postpartum hemorrhage per 1,000 delivery hospitalizations.
- Eclampsia/preeclampsia per 1,000 delivery discharges.
- Venous thromboembolism or pulmonary embolism per 1,000 delivery discharges.
- Cesarean deliveries per 1,000 deliveries.

In-Hospital Maternal Deaths, by Race/Ethnicity

In-hospital deaths per 100,000 delivery hospitalizations, females ages 12-55, by race/ethnicity, 2016-2020

Key: API = Asian or Pacific Islander.
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID), weighted to provide national estimates; and the AHRQ Quality Indicators, v2022.0. For more information, see the HCUP Methods Series Report on Methods Applying AHRQ Quality Indicators to HCUP Data (https://www.hcup-us.ahrq.gov/reports/methods/methods.jsp).
Denominator: Includes deliveries with any delivery diagnosis, procedure, or diagnosis-related group and not abortion.
Note: For this measure, lower rates are better. White, Black, and API are non-Hispanic. Hispanic includes all races.

- **Importance:** Pregnancy-related mortality in the United States rose from 7.2 deaths per 100,000 live births in 1987 to 17.3 deaths per 100,000 live births in 2017 (CDC, 2020b). Severe maternal morbidity, including mortality, disproportionately affects minority and low-income women (Fingar, et al., 2018). About one-third of pregnancy-related deaths occur at delivery or within 1 week of delivery. Maternal deaths that occur during hospital stays may

provide a window into both system and provider-level factors that can play a role in preventing maternal death (Petersen, et al., 2019).

- **Groups With Disparities, 2020:**

    - In-hospital deaths were over twice as high among Black females compared with White females (12.2 vs. 5.6 per 100,000 delivery hospitalizations).
    - In-hospital deaths were higher among Hispanic females compared with White females (8.5 vs. 5.6 per 100,000 delivery hospitalizations).

In-Hospital Maternal Deaths, by Age

In-hospital deaths per 100,000 delivery hospitalizations, females ages 12-55, by age, 2016-2020

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID), weighted to provide national estimates; and the AHRQ Quality Indicators, v2022.0. For more information, see the HCUP Methods Series Report on Methods Applying AHRQ Quality Indicators to HCUP Data (https://www.hcup-us.ahrq.gov/reports/methods/methods.jsp).
Denominator: Includes deliveries with any delivery diagnosis, procedure, or diagnosis-related group and not abortion.
Note: Data do not meet the criteria for statistical reliability, data quality, or confidentiality for the group ages 12-17 in the years 2016, 2017, and 2020. For this measure, lower rates are better.

- **Importance:** Pregnancy-related mortality in the United States rose from 7.2 deaths per 100,000 live births in 1987 to 17.3 deaths in 2017 (CDC, 2020b). About one-third of pregnancy-related deaths occur at delivery or within 1 week of delivery. Maternal deaths tha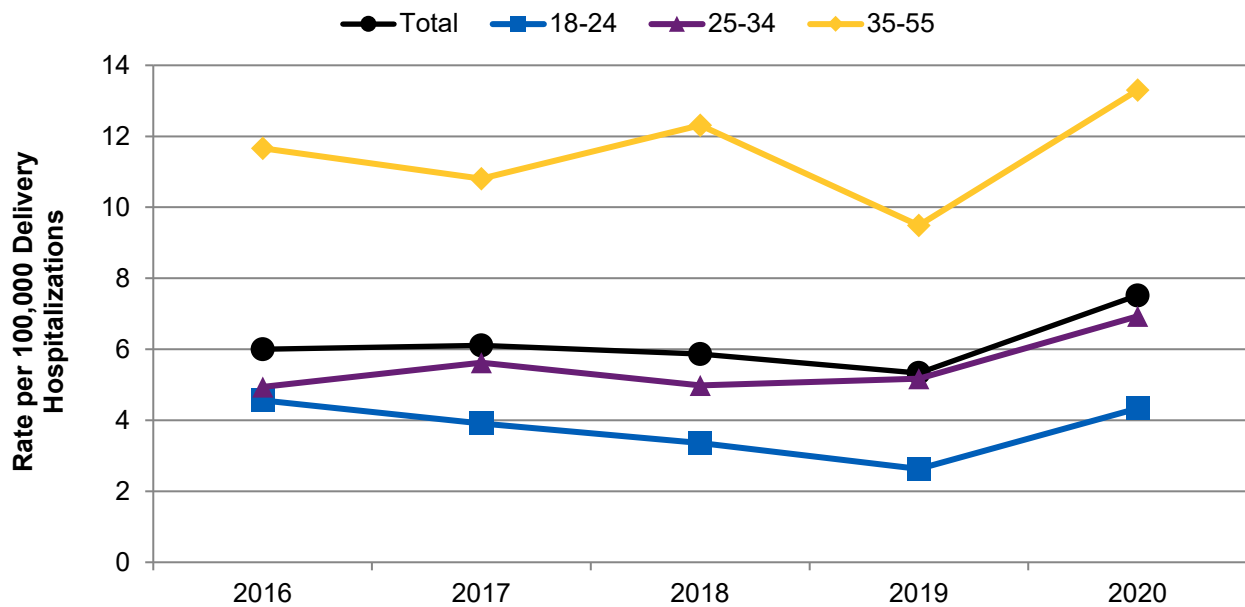t occur during hospital stays may provide a window into both system and provider-level factors that can play a role in preventing maternal death (Petersen, et al., 2019).
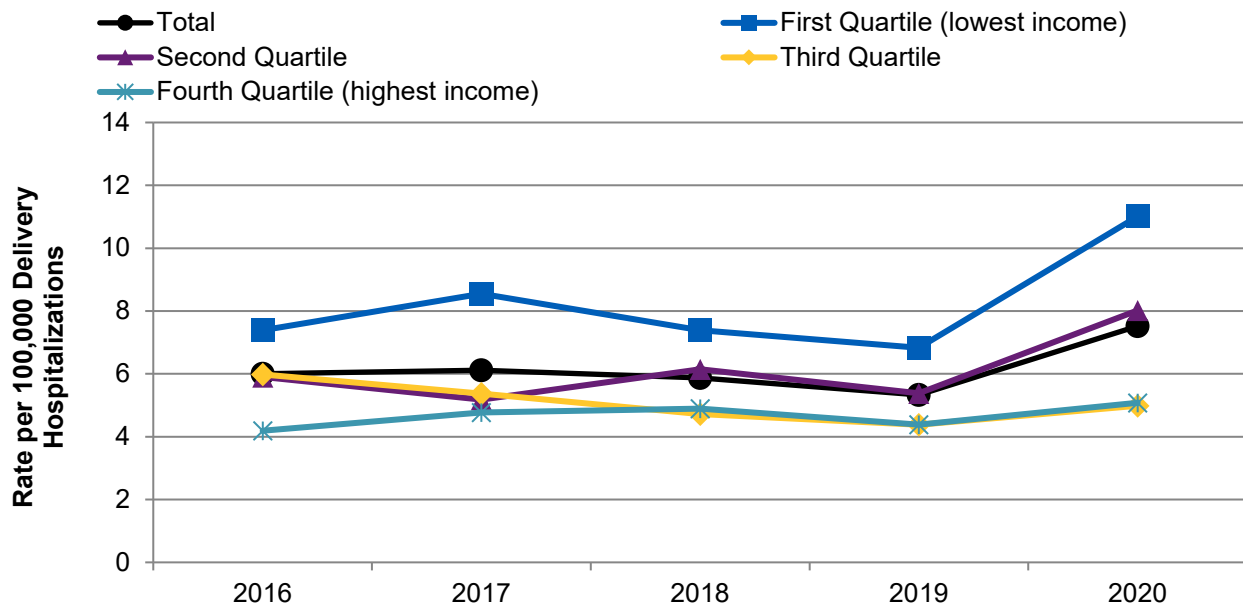- **Groups With Disparities, 2020:**

    - Compared with females ages 18-24, females ages 25-34 were 1.6 times as likely to die during a delivery hospitalization (6.9 vs. 4.3 per 100,000 delivery hospitalizations).

■ Compared with females ages 18-24, females ages 35-55 were more than three times as likely to die during a delivery hospitalization (13.3 vs. 4.3 per 100,000 delivery hospitalizations).

In-Hospital Maternal Deaths, by Income

In-hospital deaths per 100,000 delivery hospitalizations, females ages 12-55, by median income of patient's ZIP Code, 2016-2020

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID), weighted to provide national estimates; and the AHRQ Quality Indicators, v2022.0. For more information, see the HCUP Methods Series Report on Methods Applying AHRQ Quality Indicators to HCUP Data (https://www.hcup-us.ahrq.gov/reports/methods/methods.jsp).
Denominator: Includes deliveries with any delivery diagnosis, procedure, or diagnosis-related group and not abortion.
Note: For this measure, lower rates are better. First Quartile indicates that the median household income of the patient's ZIP Code falls in the lowest quartile nationally. Fourth Quartile indicates that the median household income of the patient's ZIP Code falls in the highest quartile nationally. Income is based on the federal poverty guideline (PG): first quartile = <100% of PG; second quartile = 100-199% of PG; third quartile = 200-399% of PG; fourth quartile = 400%+ of PG.

- **Importance:** Pregnancy-related mortality in the United States rose from 7.2 deaths per 100,000 live births in 1987 to 17.3 deaths in 2017 (CDC, 2020b). About one-third of pregnancy-related deaths occur at delivery or within 1 week of delivery. Maternal deaths that occur during hospital stays may provide a window into both system and provider-level factors that can play a role in preventing maternal death (Petersen, et al., 2019).
- **Groups With Disparities, 2020:**

  ■ Females residing in the lowest income area were twice as likely to die during a delivery hospitalization as females residing in the highest income areas (11.0 vs. 5.1 per 100,000 delivery hospitalizations).
  ■ Females residing in areas with incomes in the third and fourth (highest income) quartiles experienced similar rates of death during a delivery hospitalization (5.0 and 5.1 per 1,000 delivery hospitalizations, respectively).

In-Hospital Maternal Deaths, by Location of Residence

In-hospital deaths per 100,000 delivery hospitalizations, females ages 12-55, by location of patient residence, 2020

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID), weighted to provide national estimates; and the AHRQ Quality Indicators, v2022.0. For more information, see the HCUP Methods Series Report on Methods Applying AHRQ Quality Indicators to HCUP Data (https://www.hcup-us.ahrq.gov/reports/methods/methods.jsp).
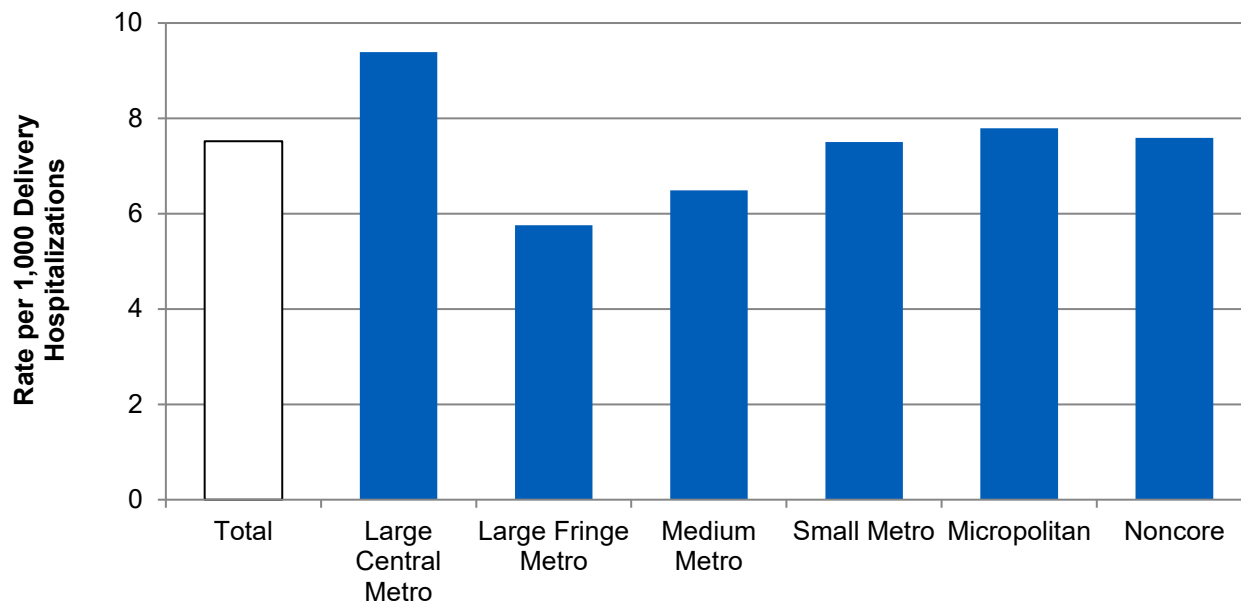**Denominator:** Includes deliveries with any delivery diagnosis, procedure, or diagnosis-related group and not abortion.
Note: For this measure, lower rates are better. The 2013 NCHS Urban–Rural Classification Scheme for Counties (https://www.cdc.gov/nchs/ data/series/sr_02/sr02_166.pdf) has more information on location of residence.

- **Importance:** Pregnancy-related mortality in the United States rose from 7.2 deaths per 100,000 live births in 1987 to 17.3 deaths in 2017 (CDC, 2020b). About one-third of pregnancy-related deaths occur at delivery or within 1 week of delivery. Maternal deaths that occur during hospital stays may provide a window into both system and provider-level factors that can play a role in preventing maternal death (Petersen, et al., 2019).
- **Groups With Disparities, 2020:**

  - Females residing in large central metro areas were more likely to die during a delivery hospitalization than females residing in a small metro area (9.4 vs. 7.5 per 100,000 delivery hospitalizations).
  - Females residing in small metro, micropolitan, and noncore areas all experienced similar rates of death during delivery hospitalization (7.5, 7.8, and 7.6 per 100,000 delivery hospitalizations, respectively).

Severe Maternal Morbidity, by Race/Ethnicity

Severe maternal morbidity per 1,000 delivery hospitalizations, females ages 12-55, by race/ethnicity, 2016-2020

Key: API = Asian or Pacific Islander.
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID), weighted to provide national estimates; and the AHRQ Quality Indicators, v2022.0. For more information, see the HCUP Methods Series Report on Methods Applying AHRQ Quality Indicators to HCUP Data (https://www.hcup-us.ahrq.gov/reports/methods/methods.jsp).
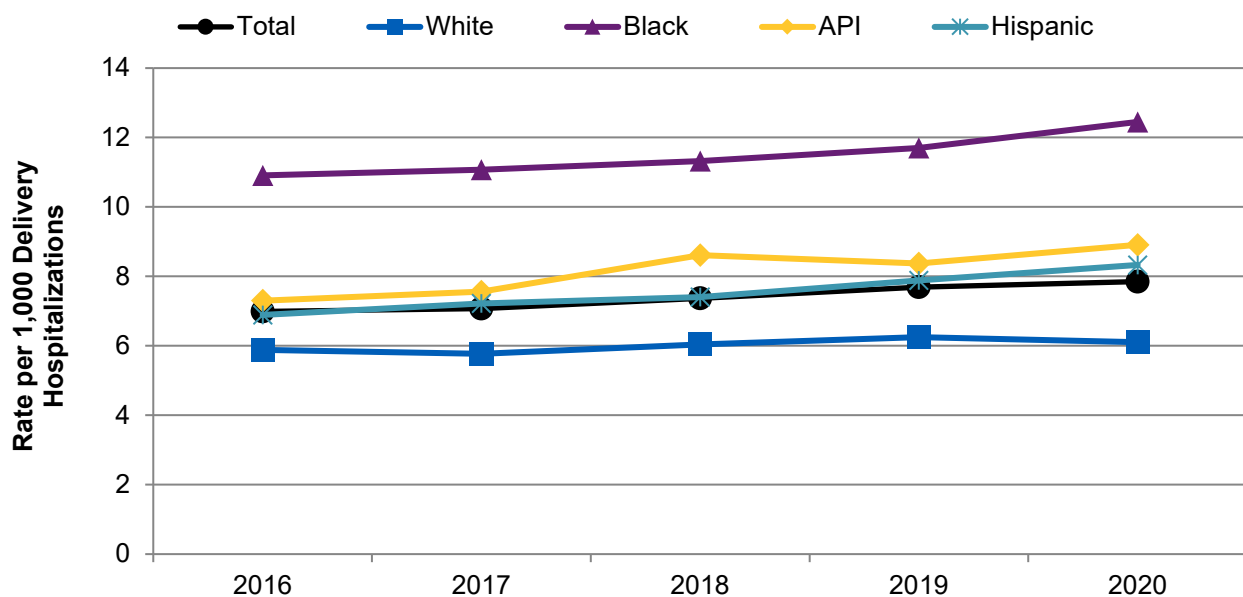**Denominator:** Inpatient stays for females ages 12-55 with any delivery diagnosis, procedure, or diagnosis-related group, excluding those with any indication of abortion.
Numerator: Subset of the denominator with any diagnosis of severe maternal morbidity as defined by the Centers for Disease Control and Prevention. Refer to "How Does CDC Identify Severe Maternal Morbidity?" at https://www.cdc.gov/reproductivehealth/maternalinfanthealth/smm/severe-morbidity-ICD.htm.
Note: For this measure, lower rates are better. White, Black, and API are non-Hispanic. Hispanic includes all races.

- **Importance:** Like maternal mortality, severe maternal morbidity, which encompasses unintended outcomes of labor and delivery that result in short-term or long-term health issues, has increased in the United States in recent decades. The perinatal period presents unique patient safety challenges, including potential overuse and underuse of interventions, misdiagnosis, and emotional harm, which contribute to maternal morbidity and perinatal adverse events (AHRQ, 2019d).
- **Groups With Disparities, 2020:**

  - Black females were more likely to experience severe maternal morbidity compared with White females (12.5 vs. 6.1 per 1,000 delivery hospitalizations).
  - API females were more likely to experience severe maternal morbidity compared with White females (8.9 vs. 6.1 per 1,000 delivery hospitalizations).
  - Hispanic females were more likely to experience severe maternal morbidity compared with White females (8.3 vs. 6.1 per 1,000 delivery hospitalizations).

Severe Maternal Morbidity, by Age

Severe maternal morbidity per 1,000 delivery hospitalizations, females ages 12-55, by age, 2016-2020

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID), weighted to provide national estimates; and the AHRQ Quality Indicators, v2022.0. For more information, see the HCUP Methods Series Report on Methods Applying AHRQ Quality Indicators to HCUP Data (https://www.hcup-us.ahrq.gov/reports/methods/methods.jsp).
Denominator: Inpatient stays for females ages 12-55 with any delivery diagnosis, procedure, or diagnosis-related group, excluding those with any indication of abortion.
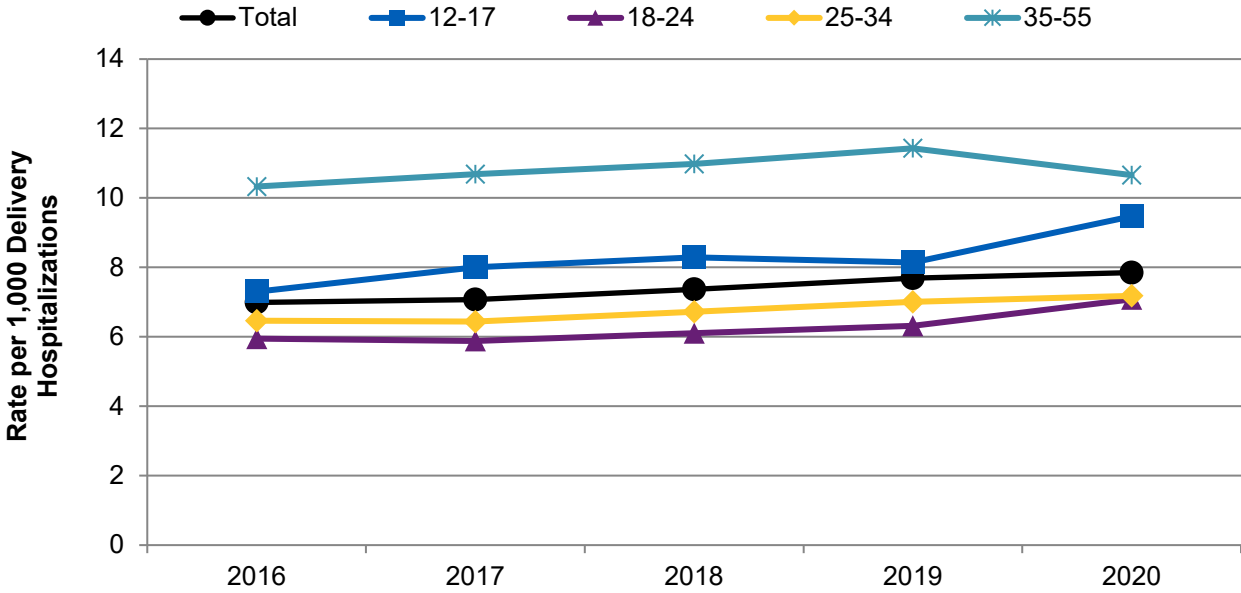**Numerator:** Subset of the denominator with any diagnosis of severe maternal morbidity as defined by the Centers for Disease Control and Prevention. Refer to "How Does CDC Identify Severe Maternal Morbidity?" at https://www.cdc.gov/reproductivehealth/maternalinfanthealth/smm/severe-morbidity-ICD.htm.
Note: For this measure, lower rates are better.

- **Importance:** Like maternal mortality, severe maternal morbidity, which encompasses unintended outcomes of labor and delivery that result in short-term or long-term health issues, has increased in the United States in recent decades. The perinatal period presents unique patient safety challenges, including potential overuse and underuse of interventions, misdiagnosis, and emotional harm, which contribute to maternal morbidity and perinatal adverse events (AHRQ, 2019d).
- **Groups With Disparities, 2020:**

  - Females ages 35-55 were more likely to experience severe maternal morbidity compared with females ages 18-24 (10.7 vs. 7.1 per 1,000 delivery hospitalizations).
  - Females ages 12-17 were more likely to experience severe maternal morbidity compared with females ages 18-24 (9.5 vs. 7.1 per 1,000 delivery hospitalizations).

Severe Maternal Morbidity, by Income

Severe maternal morbidity per 1,000 delivery hospitalizations, females ages 12-55, by median income of patient's ZIP Code, 2016-2020

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID), weighted to provide national estimates; and the AHRQ Quality Indicators, v2022.0. For more information, see the HCUP Methods Series Report on Methods Applying AHRQ Quality Indicators to HCUP Data (https://www.hcup-us.ahrq.gov/reports/methods/methods.jsp).

Denominator: Inpatient stays for females ages 12-55 with any delivery diagnosis, procedure, or diagnosis-related group, excluding those with any indication of abortion.
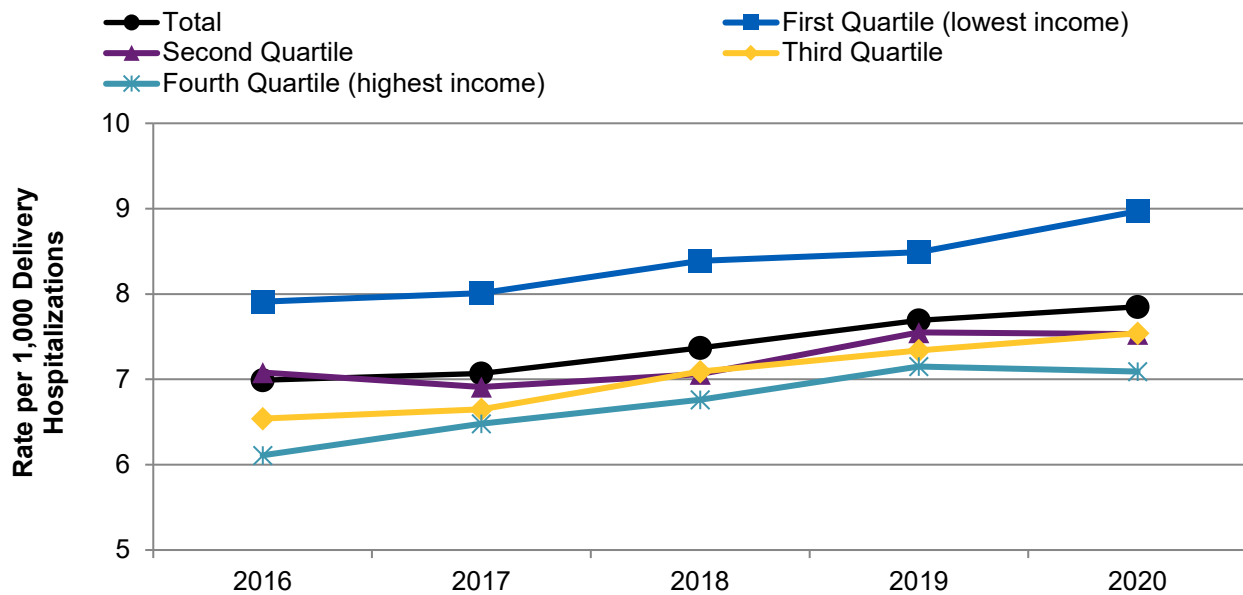
Numerator: Subset of the denominator with any diagnosis of severe maternal morbidity as defined by the Centers for Disease Control and Prevention. Refer to "How Does CDC Identify Severe Maternal Morbidity?" at https://www.cdc.gov/reproductivehealth/maternalinfanthealth/smm/severe-morbidity-ICD.htm.

Note: For this measure, lower rates are better. First Quartile indicates that the median household income of the patient's ZIP Code falls in the lowest quartile nationally. Fourth Quartile indicates that the median household income of the patient's ZIP Code falls in the highest quartile nationally. Income is based on the federal poverty guideline (PG): first quartile = <100% of PG; second quartile = 100-199% of PG; third quartile = 200-399% of PG; fourth quartile = 400%+ of PG.

- **Importance:** Like maternal mortality, severe maternal morbidity, which encompasses unintended outcomes of labor and delivery that result in short-term or long-term health issues, has increased in the United States in recent decades. The perinatal period presents unique patient safety challenges, including potential overuse and underuse of interventions, misdiagnosis, and emotional harm, which contribute to maternal morbidity and perinatal adverse events (AHRQ, 2019d).

- **Groups With Disparities, 2020:**

  - Females residing in the lowest income areas were more likely to experience severe maternal morbidity compared with females residing in the highest income areas (9.0 vs. 7.1 per 1,000 delivery hospitalizations).
  - Females residing in areas with incomes in the second and third quartiles experienced similar rates of severe maternal morbidity (7.5 per 1,000 delivery hospitalizations for both groups).

Severe Maternal Morbidity, by Payment Source

Severe maternal morbidity per 1,000 delivery hospitalizations, females ages 12-55, by expected payment source, 2016-2020

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID), weighted to provide national estimates; and the AHRQ Quality Indicators, v2022.0. For more information, see the HCUP Methods Series Report on Methods Applying AHRQ Quality Indicators to HCUP Data (https://www.hcup-us.ahrq.gov/reports/methods/methods.jsp).
Denominator: Inpatient stays for females ages 12-55 with any delivery diagnosis, procedure, or diagnosis-related group, excluding those with any indication of abortion.
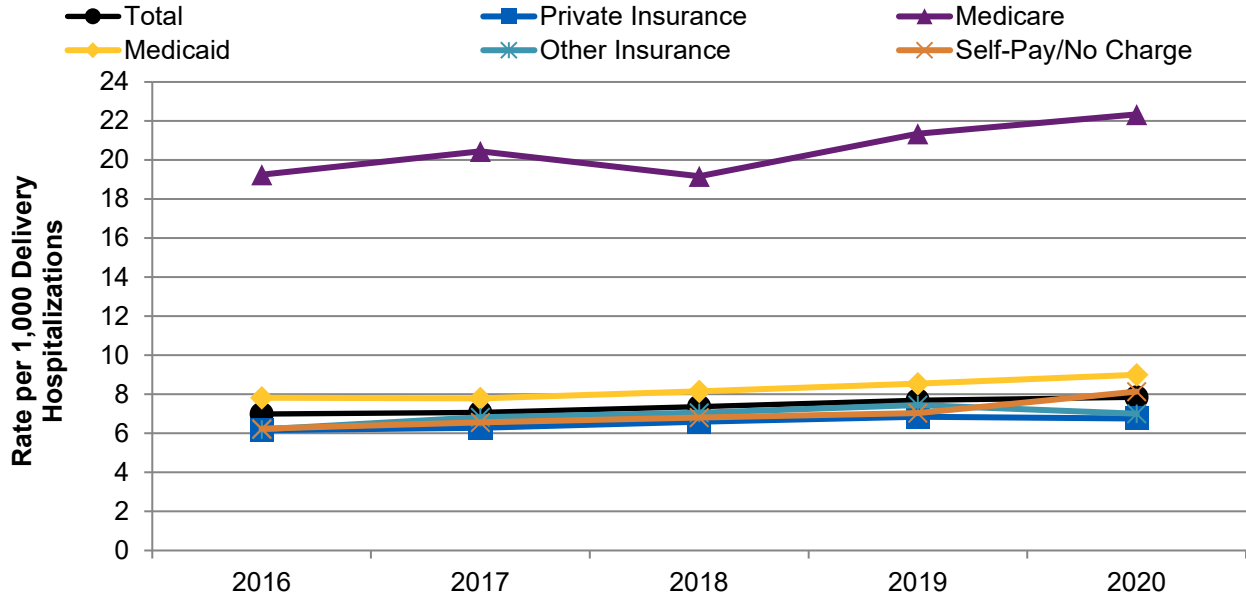**Numerator:** Subset of the denominator with any diagnosis of severe maternal morbidity as defined by the Centers for Disease Control and Prevention. Refer to "How Does CDC Identify Severe Maternal Morbidity?" at https://www.cdc.gov/reproductivehealth/maternalinfanthealth/smm/severe-morbidity-ICD.htm.
Note: For this measure, lower rates are better. Expected payment source indicates a patient's primary source of payment only. Medicare patients with a delivery diagnosis, procedure, or diagnosis-related group will have a preceding diagnosis of end-stage renal disease or another existing medical condition, increasing their risk of severe maternal morbidity and other adverse events.

- **Importance:** Like maternal mortality, severe maternal morbidity, which encompasses unintended outcomes of labor and delivery that result in short-term or long-term health issues, has increased in the United States in recent decades. The perinatal period presents unique patient safety challenges, including potential overuse and underuse of interventions, misdiagnosis, and emotional harm, which contribute to maternal morbidity and perinatal adverse events (AHRQ, 2019d).
- **Groups With Disparities, 2020:**

  - Females expected to pay with Medicare were more likely to experience severe maternal morbidity compared with females paying with any private insurance (22.3 vs. 6.8 per 1,000 delivery hospitalizations).
  - Females expected to pay with any private insurance, Medicaid, other insurance, or self-pay/no charge had similar rates of severe maternal morbidity (6.8, 9.0, 7.0, and 8.1 per 1,000 delivery hospitalizations, respectively).

Severe Maternal Morbidity, by Location of Residence

Severe maternal morbidity per 1,000 delivery hospitalizations, females ages 12-55, by location of patient residence, 2016-2020

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID), weighted to provide national estimates; and the AHRQ Quality Indicators, v2022.0. For more information, see the HCUP Methods Series Report on Methods Applying AHRQ Quality Indicators to HCUP Data (https://www.hcup-us.ahrq.gov/reports/methods/methods.jsp).
Denominator: Inpatient stays for females ages 12-55 with any delivery diagnosis, procedure, or diagnosis-related group, excluding those with any indication of abortion.
Numerator: Subset of the denominator with any diagnosis of severe maternal morbidity as defined by the Centers for Disease Control and Prevention. Refer to "How Does CDC Identify Severe Maternal Morbidity?" at https://www.cdc.gov/reproductivehealth/maternalinfanthealth/smm/severe-morbidity-ICD.htm.
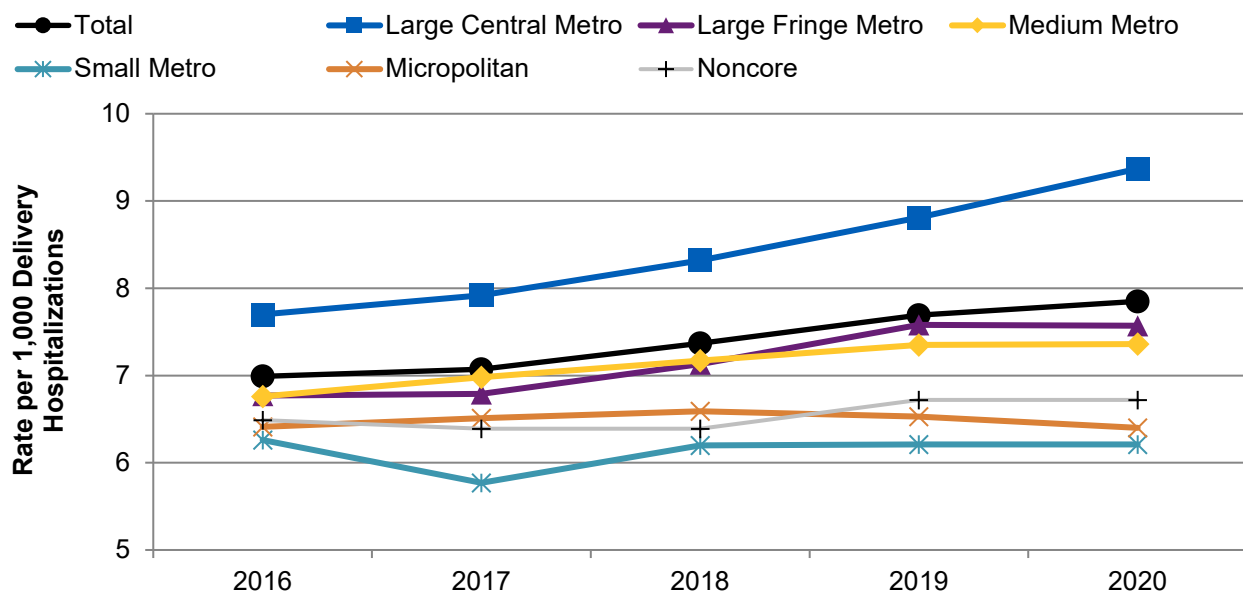**Note:** For this measure, lower rates are better. The 2013 NCHS Urban–Rural Classification Scheme for Counties (https://www.cdc.gov/nchs/ data/series/sr_02/sr02_166.pdf) has more information on location of residence.

- **Importance:** Like maternal mortality, severe maternal morbidity, which encompasses unintended outcomes of labor and delivery that result in short-term or long-term health issues, has increased in the United States in recent decades. The perinatal period presents unique patient safety challenges, including potential overuse and underuse of interventions, misdiagnosis, and emotional harm, which contribute to maternal morbidity and perinatal adverse events (AHRQ, 2019d).
- **Groups With Disparities, 2020:**

  - Females residing in large central metro areas were more likely to experience severe maternal morbidity compared with females residing in a small metro area (9.4 vs. 6.2 per 1,000 delivery hospitalizations).
  - Females residing in a large fringe metro or medium metro area experienced similar rates of severe maternal morbidity (7.6 and 7.4 per 1,000 delivery hospitalizations, respectively).

- Females residing in a small metro, micropolitan, or noncore experienced similar rates of severe maternal morbidity (6.2, 6.4, and 6.7 per 1,000 delivery hospitalizations, respectively).

Severe Postpartum Hemorrhage, by Race/Ethnicity

Severe postpartum hemorrhage per 1,000 delivery discharges, females ages 12-55, by race/ethnicity, 2016-2020

Source Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID), weighted to provide national estimates; and the AHRQ Quality Indicators, v2022.0. For more information, see the HCUP Methods Series Report on Methods Applying AHRQ Quality Indicators to HCUP Data (https://www.hcup-us.ahrq.gov/reports/methods/methods.jsp).
Denominator: Inpatient stays for females ages 12-55 with any delivery diagnosis, procedure, or diagnosis-related group, excluding those with any indication of abortion.
Numerator: Subset of the denominator with any diagnosis of postpartum hemorrhage.
Note: For this measure, lower rates are better. White, Black, and API are non-Hispanic. Hispanic includes all races.

- **Importance:** Postpartum hemorrhage refers to heavy bleeding after a vaginal delivery that does not slow or stop. Females who experience postpartum hemorrhage may have a drop in blood pressure. They may experience postpartum hemorrhage rapidly, which can lead to death (Ngwenya, 2016). Females of color experience higher rates of postpartum hemorrhage (Gyamfi-Bannerman, et al., 2018).
- **Groups With Disparities, 2020:**

  - API females were more likely to experience severe postpartum hemorrhage compared with White females (61.1 vs. 42.4 per 1,000 delivery hospitalizations).
  - Hispanic females were more likely to experience severe postpartum hemorrhage compared with White females (51.5 vs. 42.4 per 1,000 delivery hospitalizations).
  - Black females were more likely to experience severe postpartum hemorrhage compared with White females (45.8 vs. 42.4 per 1,000 delivery hospitalizations).

Severe Postpartum Hemorrhage, by Age

Severe postpartum hemorrhage per 1,000 delivery discharges, females ages 12-55, by age, 2016-2020

Source Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID), weighted to provide national estimates; and the AHRQ Quality Indicators, v2022.0. For more information, see the HCUP Methods Series Report on Methods Applying AHRQ Quality Indicators to HCUP Data (https://www.hcup-us.ahrq.gov/reports/methods/methods.jsp).
Denominator: Inpatient stays for females ages 12-55 with any delivery diagnosis, procedure, or diagnosis-related group, excluding those with any indication of abortion.
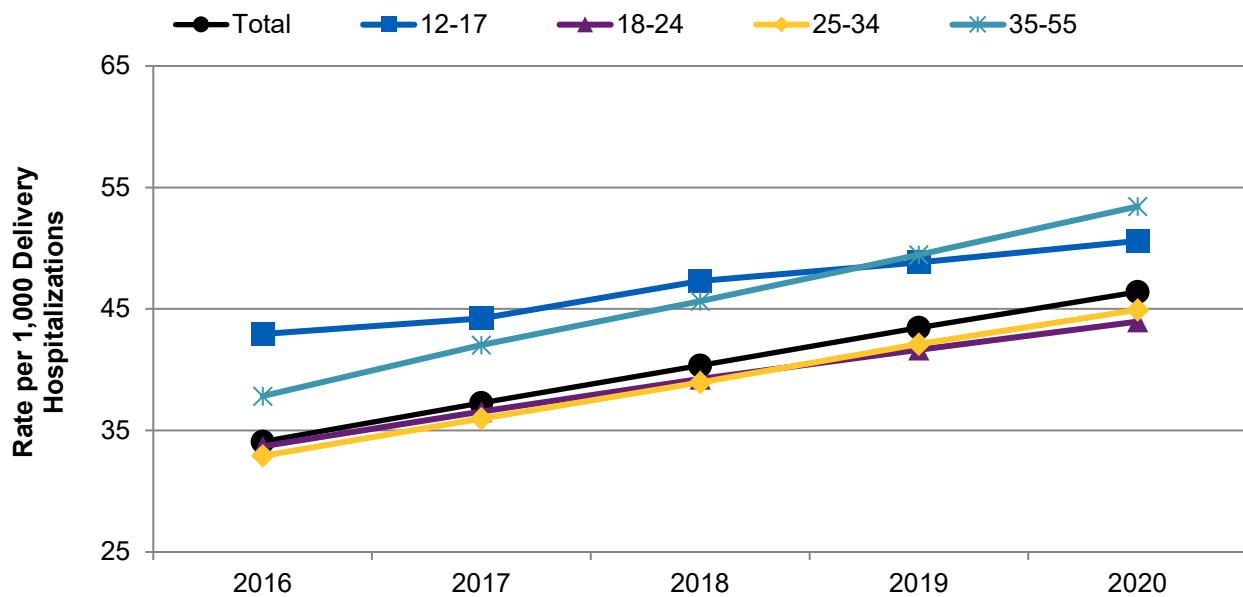**Numerator:** Subset of the denominator with any diagnosis of postpartum hemorrhage.
Note: For this measure, lower rates are better.

- **Importance:** Postpartum hemorrhage refers to heavy bleeding after a vaginal delivery that does not slow or stop. Females who experience postpartum hemorrhage may have a drop in blood pressure. They may experience postpartum hemorrhage rapidly, which can lead to death (Ngwenya, 2016). Females of color experience higher rates of postpartum hemorrhage (Gyamfi-Bannerman, et al., 2018).
- **Groups With Disparities, 2020:**

  - Females ages 35-55 were more likely to experience severe postpartum hemorrhage compared with females ages 18-24 (53.4 vs. 44.0 per 1,000 delivery hospitalizations).
  - Females ages 35-55 and 12-17 experienced similar rates of severe postpartum hemorrhage (53.4 and 50.6 per 1,000 delivery hospitalizations, respectively).
  - Females ages 18-24 and 25-34 experienced similar rates of severe postpartum hemorrhage (44.0 and 45.0 per 1,000 delivery hospitalizations, respectively).

Severe Postpartum Hemorrhage, by Income

Severe postpartum hemorrhage per 1,000 delivery discharges, females ages 12-55, by median income of patient's ZIP Code, 2016-2020

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID), weighted to provide national estimates; and the AHRQ Quality Indicators, v2022.0. For more information, see the HCUP Methods Series Report on Methods Applying AHRQ Quality Indicators to HCUP Data (https://www.hcup-us.ahrq.gov/reports/methods/methods.jsp).
Denominator: Inpatient stays for females ages 12-55 with any delivery diagnosis, procedure, or diagnosis-related group, excluding those with any indication of abortion.
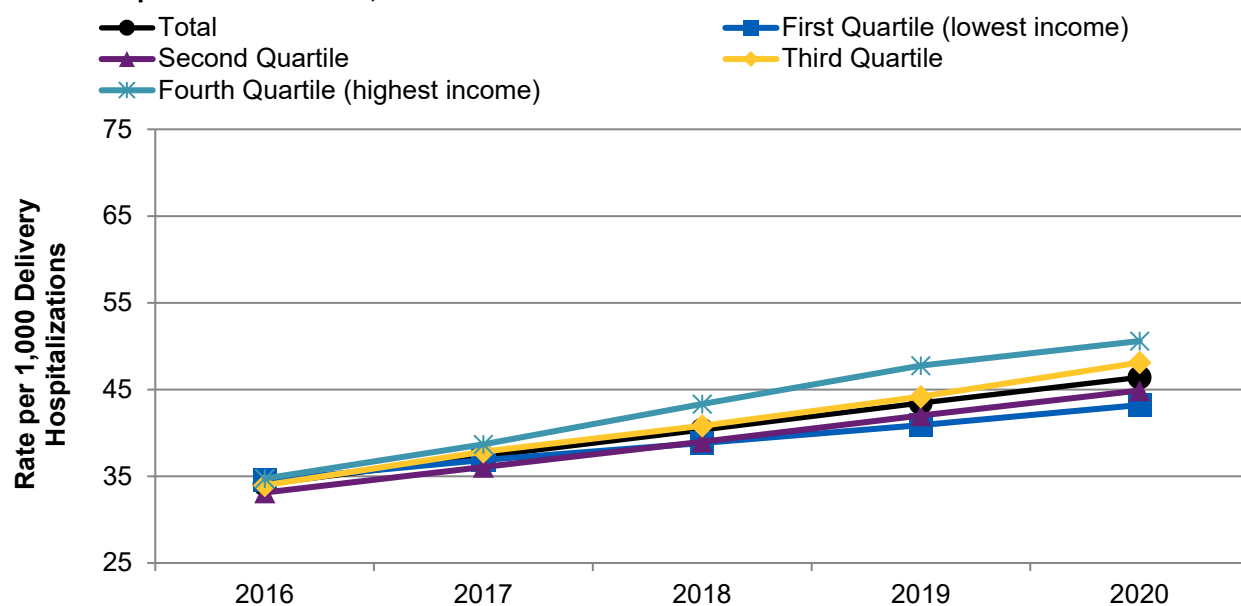**Numerator:** Subset of the denominator with any diagnosis of postpartum hemorrhage.
Note: For this measure, lower rates are better. First Quartile indicates that the median household income of the patient's ZIP Code falls in the lowest quartile nationally. Fourth Quartile indicates that the median household income of the patient's ZIP Code falls in the highest quartile nationally. Income is based on the federal poverty guideline (PG): first quartile = <100% of PG; second quartile = 100-199% of PG; third quartile = 200-399% of PG; fourth quartile = 400%+ of PG.

- **Importance:** Postpartum hemorrhage refers to heavy bleeding after a vaginal delivery that does not slow or stop. Females who experience postpartum hemorrhage may have a drop in blood pressure. They may experience postpartum hemorrhage rapidly, which can lead to death (Ngwenya, 2016). Females of color experience higher rates of postpartum hemorrhage (Gyamfi-Bannerman, et al., 2018).
- **Groups With Disparities, 2020:**

  - Females residing in the highest income areas were more likely to experience severe postpartum hemorrhage compared with females residing in the lowest income areas (50.6 vs. 43.2 per 1,000 delivery hospitalizations).
  - Females residing in the lowest income (first quartile) and second quartile areas experienced similar rates of postpartum hemorrhage (43.2 and 44.9 per 1,000 delivery hospitalizations, respectively).

Severe Postpartum Hemorrhage, by Payment Source

Severe postpartum hemorrhage per 1,000 delivery discharges, females ages 12-55, by expected payment source, 2016-2020

Legend: Total ● | Private Insurance ■ | Medicare ▲ | Medicaid ◆ | Other Insurance ✳ | Self-Pay/No Charge ✕

Y-axis: Rate per 1,000 Delivery Hospitalizations (25 to 75)
X-axis: 2016, 2017, 2018, 2019, 2020

Source Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID), weighted to provide national estimates; and the AHRQ Quality Indicators, v2022.0. For more information, see the HCUP Methods Series Report on Methods Applying AHRQ Quality Indicators to HCUP Data (https://www.hcup-us.ahrq.gov/reports/methods/methods.jsp).
Denominator: Inpatient stays for females ages 12-55 with any delivery diagnosis, procedure, or diagnosis-related group, excluding those with any indication of abortion.
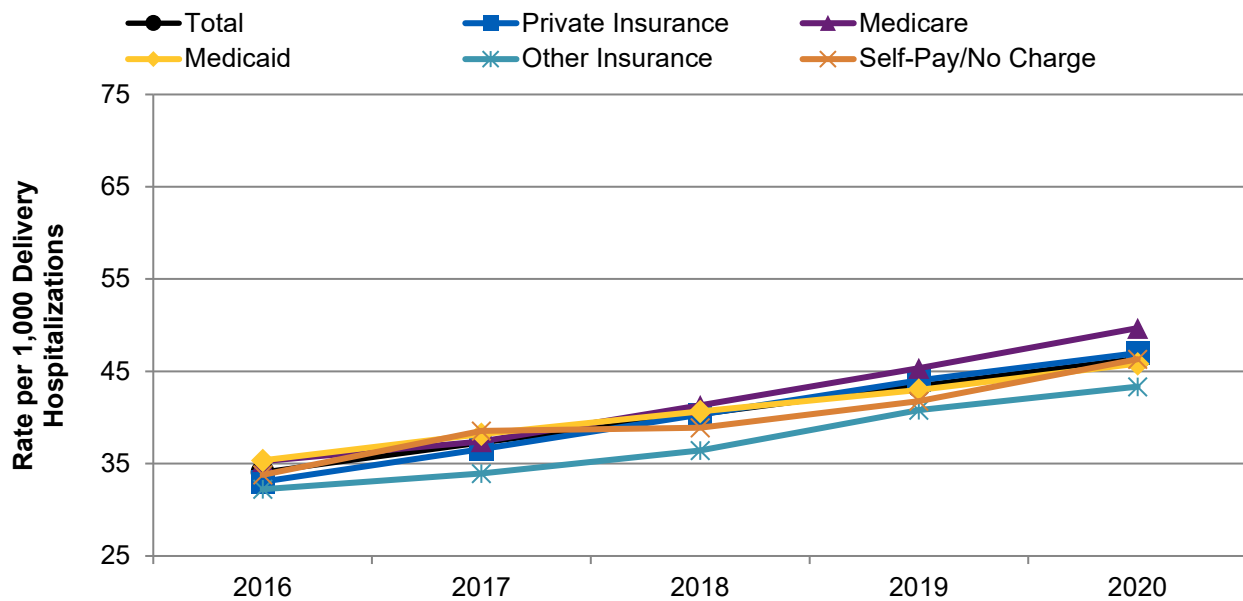**Numerator:** Subset of the denominator with any diagnosis of postpartum hemorrhage.
Note: For this measure, lower rates are better. Expected payment source indicates a patient's primary source of payment only. Medicare patients with a delivery diagnosis, procedure, or diagnosis-related group will have a preceding diagnosis of end-stage renal disease or another existing medical condition, increasing their risk of severe postpartum hemorrhage and other adverse events.

- **Importance:** Postpartum hemorrhage refers to heavy bleeding after a vaginal delivery that does not slow or stop. Females who experience postpartum hemorrhage may have a drop in blood pressure. They may experience postpartum hemorrhage rapidly, which can lead to death (Ngwenya, 2016). Females of color experience higher rates of postpartum hemorrhage (Gyamfi-Bannerman, et al., 2018).
- **Groups With Disparities, 2020:**

  - There were no statistically significant disparities for female patients experiencing severe postpartum hemorrhage by expected payment source.

Severe Postpartum Hemorrhage, by Location of Residence

Severe postpartum hemorrhage per 1,000 delivery hospitalizations, females ages 12-55, by location of patient residence, 2016-2020

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID), weighted to provide national estimates; and the AHRQ Quality Indicators, v2022.0. For more information, see the HCUP Methods Series Report on Methods Applying AHRQ Quality Indicators to HCUP Data (https://www.hcup-us.ahrq.gov/reports/methods/methods.jsp).
Denominator: Inpatient stays for females ages 12-55 with any delivery diagnosis, procedure, or diagnosis-related group, excluding those with any indication of abortion.
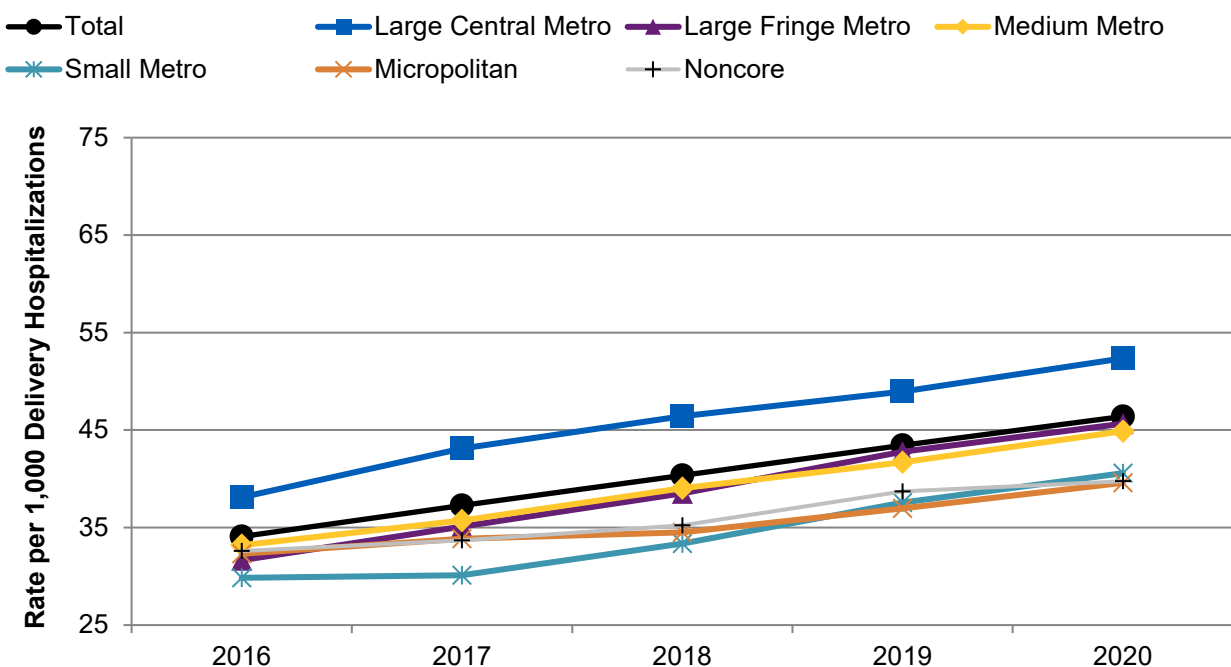**Numerator:** Subset of the denominator with any diagnosis of postpartum hemorrhage.
Note: For this measure, lower rates are better. The 2013 Urban–Rural Classification Scheme for Counties (https://www.cdc.gov/nchs/data/series/sr_02/sr02_166.pdf) has more information on location of residence.

- **Importance:** Postpartum hemorrhage refers to heavy bleeding after a vaginal delivery that does not slow or stop. Females who experience postpartum hemorrhage may have a drop in blood pressure. They may experience postpartum hemorrhage rapidly, which can lead to death (Ngwenya, 2016). Females of color experience higher rates of postpartum hemorrhage (Gyamfi-Bannerman, et al., 2018).
- **Groups With Disparities, 2020:**

  - Females residing in large central metro areas were more likely to experience severe postpartum hemorrhage compared with females residing in a micropolitan area (52.4 vs. 39.6 per 1,000 delivery hospitalizations).
  - Females residing in a large fringe metro or medium metro area experienced similar rates of severe postpartum hemorrhage (45.7 and 44.9 per 1,000 delivery hospitalizations, respectively).
  - Females residing in a small metro, micropolitan, or noncore area experienced similar rates of severe postpartum hemorrhage (40.6, 39.6, and 39.8 per 1,000 delivery hospitalizations, respectively).

Eclampsia/Preeclampsia, by Race/Ethnicity

Eclampsia/preeclampsia per 1,000 delivery discharges, women ages 12-55, by race/ethnicity, 2016-2020

Key: API = Asian or Pacific Islander.
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID), weighted to provide national estimates; and the AHRQ Quality Indicators, v2022.0. For more information, see the HCUP Methods Series Report on Methods Applying AHRQ Quality Indicators to HCUP Data (https://www.hcup-us.ahrq.gov/reports/methods/methods.jsp).
Denominator: Discharge from inpatient stays for women ages 12-55 with any delivery diagnosis, procedure, or diagnosis-related group, excluding those with any indication of abortion.
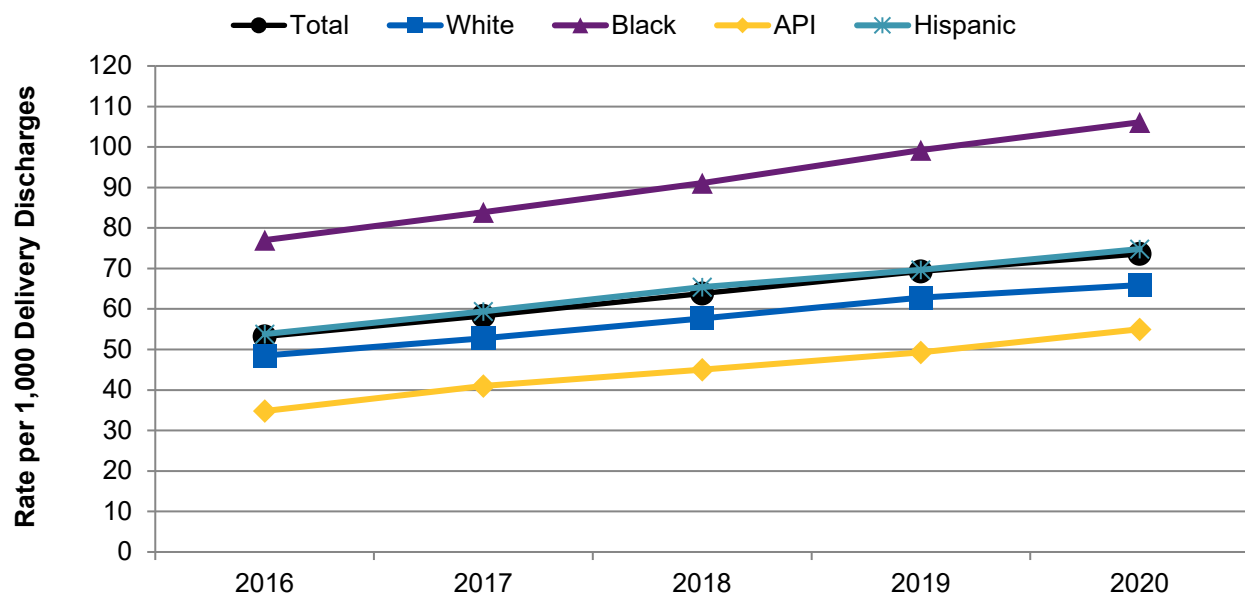**Numerator:** Subset of the denominator with any diagnosis of preeclampsia or eclampsia.
Note: For this measure, lower rates are better. White, Black, and API are non-Hispanic. Hispanic includes all races.

- **Importance:** High blood pressure occurs in 1 in every 12-17 pregnancies among women ages 22-44 years (Bateman, et al., 2012). Complications due to high blood pressure can result in preeclampsia (untreated high blood pressure that may result in organ damage) or eclampsia (onset of seizures or a coma in women with preeclampsia) (Medline Plus, 2021a, 2021b).
- **Groups With Disparities, 2020:**

  - Eclampsia/preeclampsia was more common among Black females compared with White females (106.1 vs. 65.9 per 1,000 delivery discharges).
  - Eclampsia/preeclampsia was less common among API females compared with White females (55.0 vs. 65.9 per 1,000 delivery discharges).

Eclampsia/Preeclampsia, by Age

Eclampsia/preeclampsia per 1,000 delivery discharges, women ages 12-55, by age, 2016-2020

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID), weighted to provide national estimates; and the AHRQ Quality Indicators, v2022.0. For more information, see the HCUP Methods Series Report on Methods Applying AHRQ Quality Indicators to HCUP Data (https://www.hcup-us.ahrq.gov/reports/methods/methods.jsp).
Denominator: Discharge from inpatient stays for women ages 12-55 with any delivery diagnosis, procedure, or diagnosis-related group, excluding those with any indication of abortion.
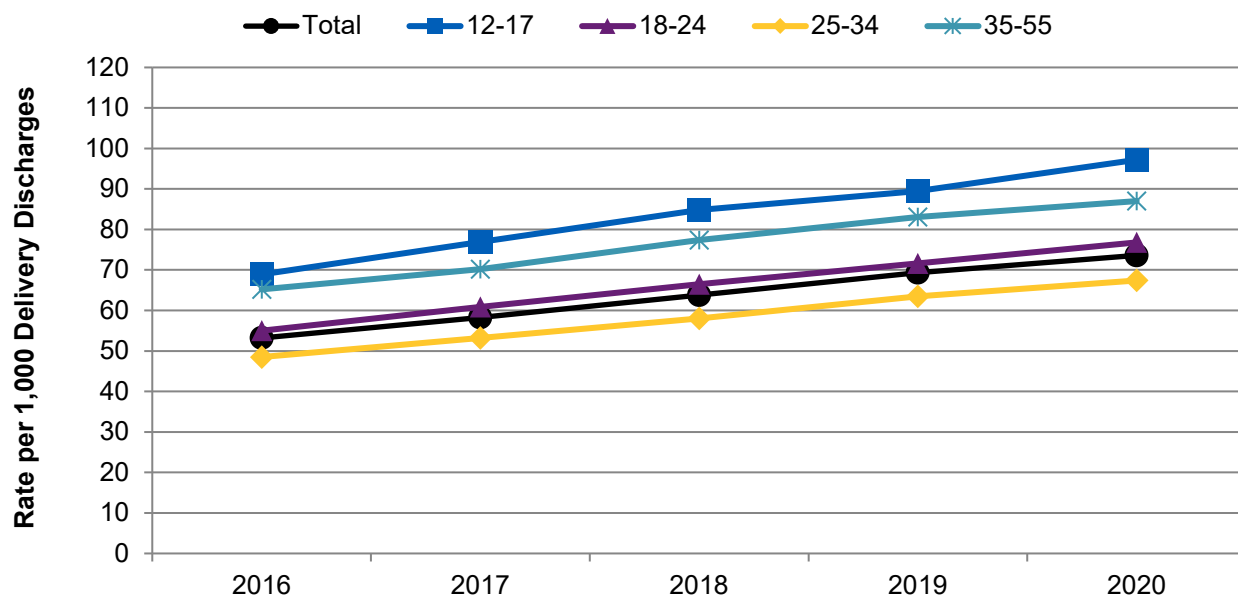**Numerator:** Subset of the denominator with any diagnosis of preeclampsia or eclampsia.
Note: For this measure, lower rates are better.

- **Importance:** High blood pressure occurs in 1 in every 12-17 pregnancies among women ages 22-44 years (Bateman, et al., 2012). Complications due to high blood pressure can result in preeclampsia (untreated high blood pressure that may result in organ damage) or eclampsia (onset of seizures or a coma in women with preeclampsia) (Medline Plus, 2021a, 2021b).
- **Groups With Disparities, 2020:**

  - Eclampsia/preeclampsia was more common among females ages 12-17 compared with females ages 25-34 (97.2 vs. 67.4 per 1,000 delivery discharges).
  - Eclampsia/preeclampsia was more common among females ages 35-55 compared with females ages 25-34 (87.0 vs. 67.4 per 1,000 delivery discharges).

Eclampsia/Preeclampsia, by Income

Eclampsia/preeclampsia per 1,000 delivery discharges, women ages 12-55, by median income of patient's ZIP Code, 2016-2020

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID), weighted to provide national estimates; and the AHRQ Quality Indicators, v2022.0. For more information, see the HCUP Methods Series Report on Methods Applying AHRQ Quality Indicators to HCUP Data (https://www.hcup-us.ahrq.gov/reports/methods/methods.jsp).

Denominator: Discharge from inpatient stays for women ages 12-55 with any delivery diagnosis, procedure, or diagnosis-related group, excluding those with any indication of abortion.

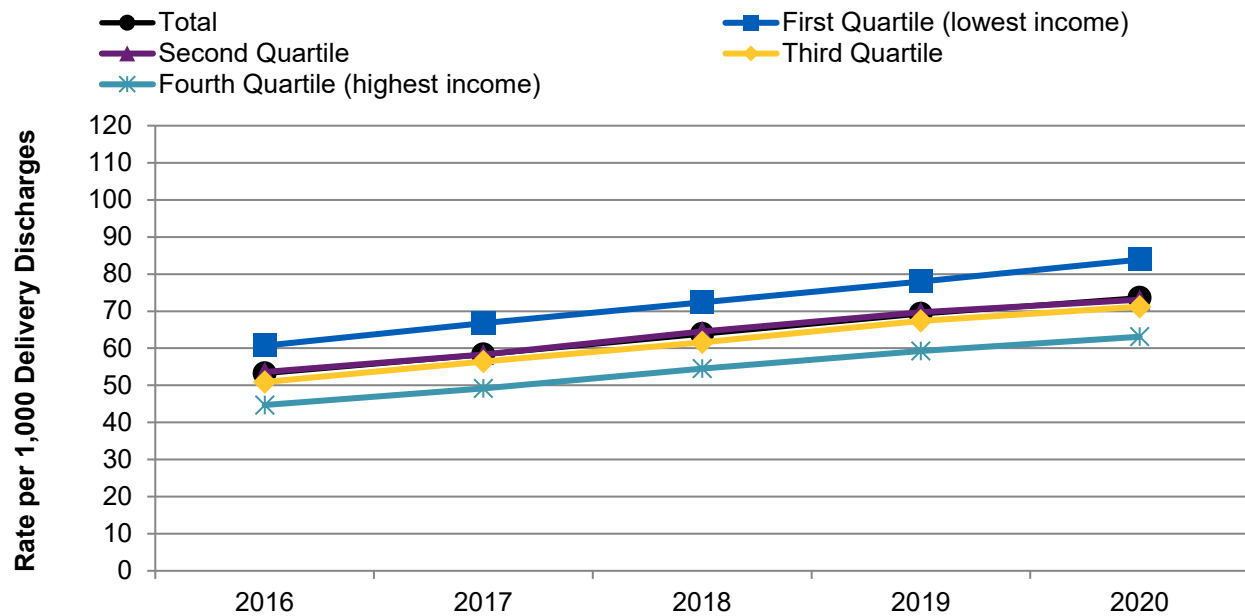**Numerator:** Subset of the denominator with any diagnosis of preeclampsia or eclampsia.

Note: For this measure, lower rates are better. First Quartile indicates that the median household income of the patient's ZIP Code falls in the lowest quartile nationally. Fourth Quartile indicates that the median household income of the patient's ZIP Code falls in the highest quartile nationally. Income is based on the federal poverty guideline (PG): first quartile = <100% of PG; second quartile = 100-199% of PG; third quartile = 200-399% of PG; fourth quartile = 400%+ of PG.

- **Importance:** High blood pressure occurs in 1 in every 12-17 pregnancies among women ages 22-44 years (Bateman, et al., 2012). Complications due to high blood pressure can result in preeclampsia (untreated high blood pressure that may result in organ damage) or eclampsia (the onset of seizures or a coma in women with preeclampsia) (Medline Plus, 2021a, 2021b).

- **Groups With Disparities, 2020:**

  - Eclampsia/preeclampsia was more common among females residing in the lowest income areas compared with females residing in the highest income areas (83.9 vs. 63.1 per 1,000 delivery discharges).

  - Females residing in the second or third quartile income areas experienced similar rates of eclampsia/preeclampsia (73.1 and 71.2 per 1,000 delivery discharges, respectively).

Eclampsia/Preeclampsia, by Payment Source

Eclampsia/preeclampsia per 1,000 delivery discharges, women ages 12-55, by expected payment source, 2016-2020

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID), weighted to provide national estimates; and the AHRQ Quality Indicators, v2022.0. For more information, see the HCUP Methods Series Report on Methods Applying AHRQ Quality Indicators to HCUP Data (https://www.hcup-us.ahrq.gov/reports/methods/methods.jsp).

Denominator: Discharge from inpatient stays for women ages 12-55 with any delivery diagnosis, procedure, or diagnosis-related group, excluding those with any indication of abortion.
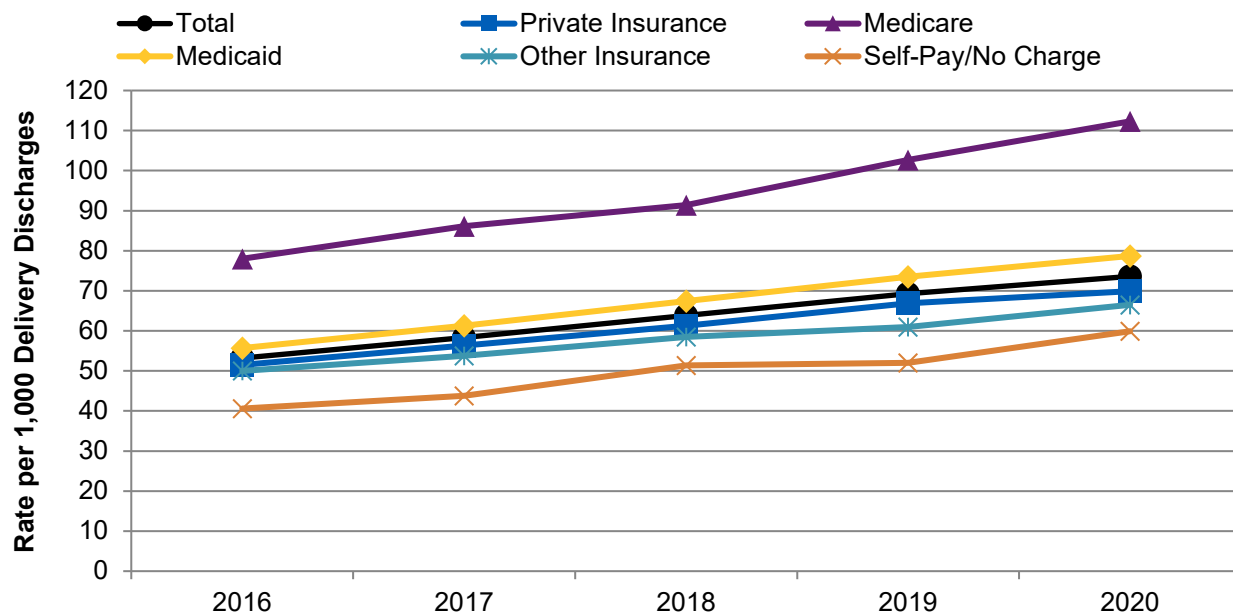
Numerator: Subset of the denominator with any diagnosis of preeclampsia or eclampsia.

Note: For this measure, lower rates are better. Expected payment source indicates a patient's primary source of payment only. Medicare patients with a delivery diagnosis, procedure, or diagnosis-related group will have a preceding diagnosis of end-stage renal disease or another existing medical condition, increasing their risk of eclampsia/preeclampsia and other adverse events.

- **Importance:** High blood pressure occurs in 1 in every 12-17 pregnancies among women ages 22-44 years (Bateman, et al., 2012). Complications due to high blood pressure can result in preeclampsia (untreated high blood pressure that may result in organ damage) or eclampsia (the onset of seizures or a coma in women with preeclampsia) (Medline Plus, 2021a, 2021b).

- **Groups With Disparities, 2020:**

  - Eclampsia/preeclampsia was more common among females expected to pay with Medicare compared with females in the self-pay/no charge group (112.3 vs. 59.9 per 1,000 delivery discharges).
  - Eclampsia/preeclampsia was more common among females expected to pay with Medicaid compared with females expected to pay with private insurance (78.7 vs. 69.9 per 1,000 delivery discharges).
  - Eclampsia/preeclampsia was more common among females expected to pay with any private insurance or other insurance compared with females in the self-pay/no charge group (69.9 and 66.5, respectively, vs. 59.9 per 1,000 delivery discharges).

Eclampsia/Preeclampsia, by Location of Residence

Eclampsia/preeclampsia per 1,000 delivery discharges, women ages 12-55, by location of patient residence, 2016-2020

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID), weighted to provide national estimates; and the AHRQ Quality Indicators, v2022.0. For more information, see the HCUP Methods Series Report on Methods Applying AHRQ Quality Indicators to HCUP Data (https://www.hcup-us.ahrq.gov/reports/methods/methods.jsp).
Denominator: Discharge from inpatient stays for women ages 12-55 with any delivery diagnosis, procedure, or diagnosis-related group, excluding those with any indication of abortion.
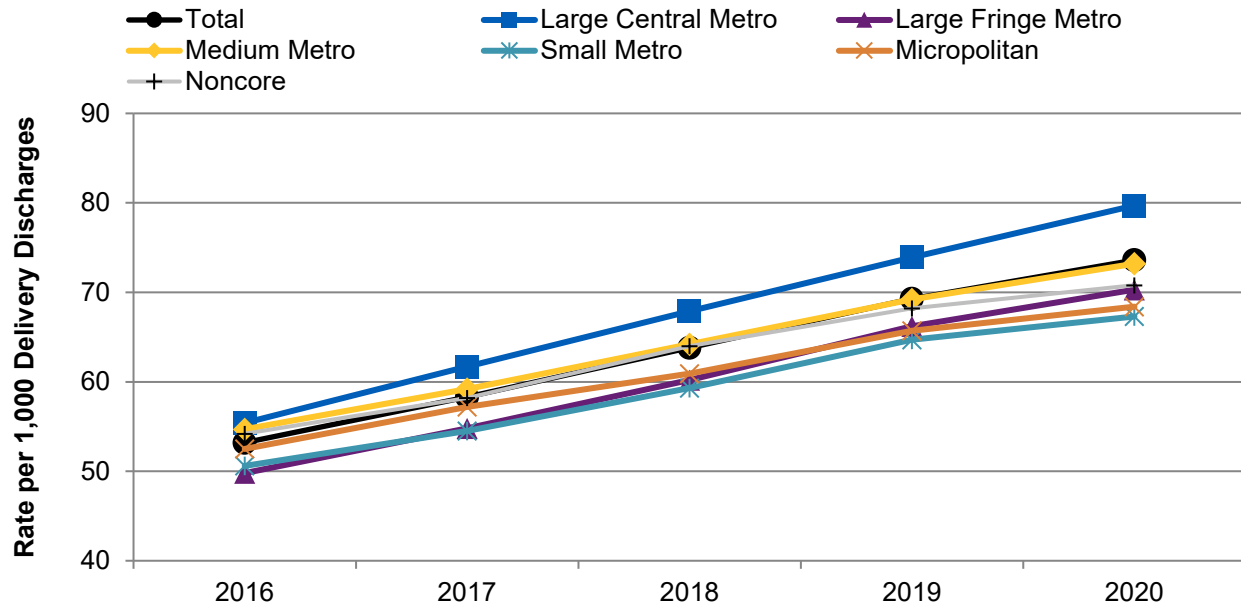**Numerator:** Subset of the denominator with any diagnosis of preeclampsia or eclampsia.
Note: For this measure, lower rates are better. The 2013 Urban–Rural Classification Scheme for Counties (https://www.cdc.gov/nchs/data/series/sr_02/sr02_166.pdf) has more information on location of residence.

- **Importance:** High blood pressure occurs in 1 in every 12-17 pregnancies among women ages 22-44 years (Bateman, et al., 2012). Complications due to high blood pressure can result in preeclampsia (untreated high blood pressure that may result in organ damage) or eclampsia (the onset of seizures or a coma in women with preeclampsia) (Medline Plus, 2021a, 2021b).

- **Groups With Disparities, 2020:**

  - Eclampsia/preeclampsia was more common among females residing in large central metro areas compared with females residing in a small metro area (79.7 vs. 67.3 per 1,000 delivery discharges).
  - Eclampsia/preeclampsia was more common among females residing in a medium metro area compared with females residing in a micropolitan area (73.2 vs. 68.4 per 1,000 delivery discharges).
  - Females residing in large fringe metro or noncore areas experienced similar rates of eclampsia/preeclampsia (70.3 and 70.8 per 1,000 delivery discharges, respectively).

Venous Thromboembolism or Pulmonary Embolism, by Race/Ethnicity

Venous thromboembolism or pulmonary embolism per 1,000 delivery discharges, females ages 12-55, by race/ethnicity, 2016-2020

Key: API = Asian or Pacific Islander.

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID), weighted to provide national estimates; and the AHRQ Quality Indicators, v2022.0. For more information, see the HCUP Methods Series Report on Methods Applying AHRQ Quality Indicators to HCUP Data (https://www.hcup-us.ahrq.gov/reports/methods/methods.jsp).

Denominator: Includes deliveries with any delivery diagnosis, procedure, or diagnosis-related group and not abortion.

Note: For this measure, lower rates are better. White, Black, and API are non-Hispanic. Hispanic includes all races.

- **Importance:** Venous thromboembolism (VTE), which includes deep vein thrombosis and pulmonary embolism (PE), is the development of blood clots. It is one cause of pregnancy-related mortality. Deaths due to PE account for 9.2% of all pregnancy-related deaths or approximately 1.5 deaths per 100,000 live births (Abe, et al., 2019). Reductions in VTE and PE could save lives.

- **Groups With Disparities, 2020:**

  - API females had a lower VTE/PE rate than Black females (0.17 vs. 0.42 per 1,000 delivery discharges).

Venous Thromboembolism or Pulmonary Embolism, by Age

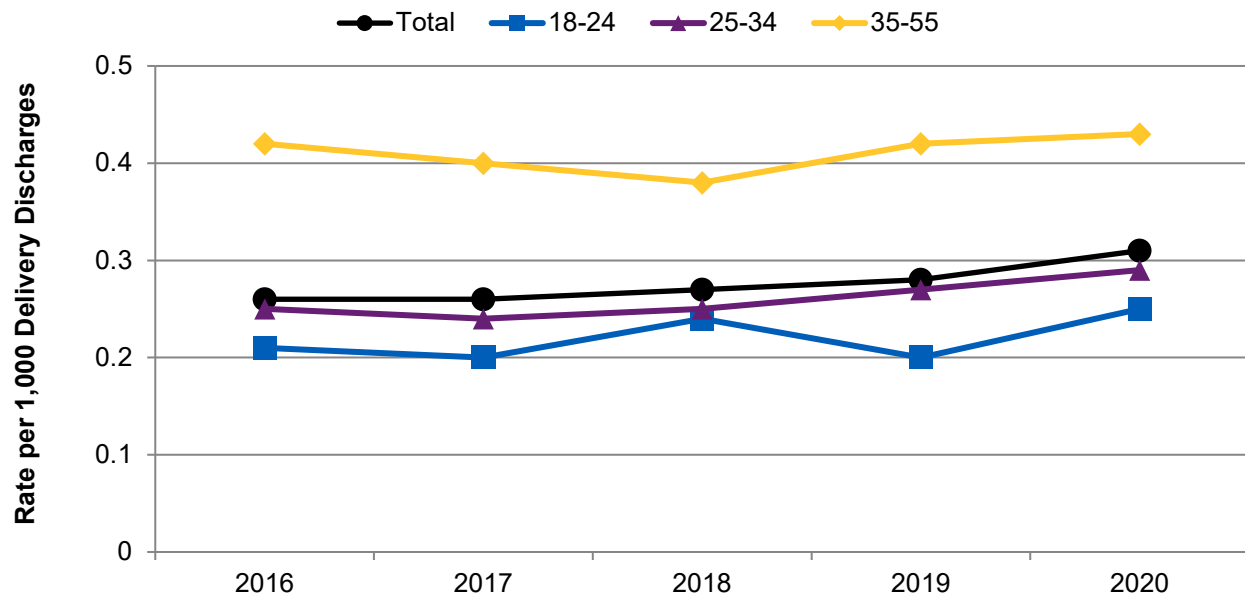**Venous thromboembolism or pulmonary embolism per 1,000 delivery discharges, females ages 12-55, by age, 2016-2020**

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID), weighted to provide national estimates; and the AHRQ Quality Indicators, v2022.0. For more information, see the HCUP Methods Series Report on Methods Applying AHRQ Quality Indicators to HCUP Data (https://www.hcup-us.ahrq.gov/reports/methods/methods.jsp).

Denominator: Includes deliveries with any delivery diagnosis, procedure, or diagnosis-related group and not abortion.

Note: For this measure, lower rates are better. Data do not meet the criteria for statistical reliability, data quality, or confidentiality for the group ages 12-17.

- **Importance:** Venous thromboembolism (VTE), which includes deep vein thrombosis and pulmonary embolism (PE), is the development of blood clots. It is one cause of pregnancy-related mortality. Deaths due to PE account for 9.2% of all pregnancy-related deaths or approximately 1.5 deaths per 100,000 live births (Abe, et al., 2019). Reductions in VTE and PE could save lives.
- **Groups With Disparities, 2020:**

  - There were no statistically significant disparities for female patients experiencing VTE/PE by age.

Venous Thromboembolism or Pulmonary Embolism, by Income

Venous thromboembolism or pulmonary embolism per 1,000 delivery discharges, females ages 12-55, by median income of patient's ZIP Code, 2016-2020

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID), weighted to provide national estimates; and the AHRQ Quality Indicators, v2022.0. For more information, see the HCUP Methods Series Report on Methods Applying AHRQ Quality Indicators to HCUP Data (https://www.hcup-us.ahrq.gov/reports/methods/methods.jsp).
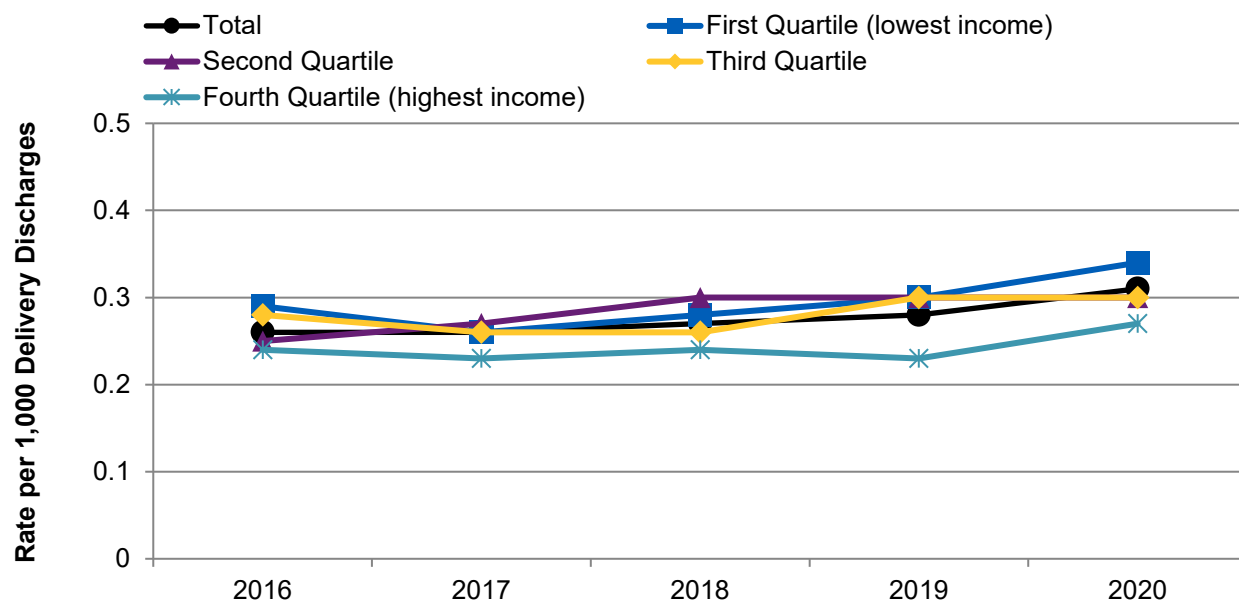
Denominator: Includes deliveries with any delivery diagnosis, procedure, or diagnosis-related group and not abortion.

Note: For this measure, lower rates are better. First Quartile indicates that the median household income of the patient's ZIP Code falls in the lowest quartile nationally. Fourth Quartile indicates that the median household income of the patient's ZIP Code falls in the highest quartile nationally. Income is based on the federal poverty guideline (PG): first quartile = <100% of PG; second quartile = 100-199% of PG; third quartile = 200-399% of PG; fourth quartile = 400%+ of PG.

- **Importance:** Venous thromboembolism (VTE), which includes deep vein thrombosis and pulmonary embolism (PE), is the development of blood clots. It is one cause of pregnancy-related mortality. Deaths due to PE account for 9.2% of all pregnancy-related deaths or approximately 1.5 deaths per 100,000 live births (Abe, et al., 2019). Reductions in VTE and PE could save lives.

- **Groups With Disparities, 2020:**

  - There were no statistically significant disparities for female patients experiencing VTE/PE by median income of ZIP Code.

Venous Thromboembolism or Pulmonary Embolism, by Payment Source

Venous thromboembolism or pulmonary embolism per 1,000 delivery discharges, females ages 12-55, by expected payment source, 2016-2020

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID), weighted to provide national estimates; and the AHRQ Quality Indicators, v2022.0. For more information, see the HCUP Methods Series Report on Methods Applying AHRQ Quality Indicators to HCUP Data (https://www.hcup-us.ahrq.gov/reports/methods/methods.jsp).
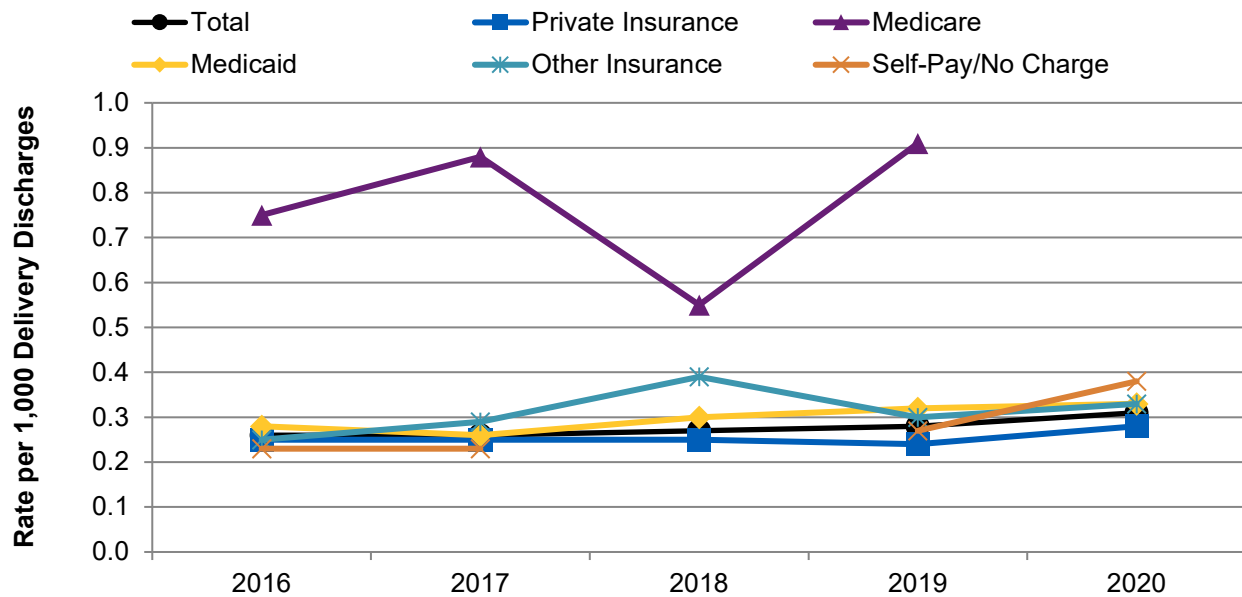
Denominator: Includes deliveries with any delivery diagnosis, procedure, or diagnosis-related group and not abortion.

Note: For this measure, lower rates are better. Expected payment source indicates a patient's primary source of payment only. Data do not meet the criteria for statistical reliability, data quality, or confidentiality for the group Medicare in 2020 and the group Self pay/no charge in 2018. Medicare patients with a delivery diagnosis, procedure, or diagnosis-related group will have a preceding diagnosis of end-stage renal disease or another existing medical condition, increasing their risk of VTE/PE and other adverse events.

- **Importance:** Venous thromboembolism (VTE), which includes deep vein thrombosis and pulmonary embolism (PE), is the development of blood clots. It is one cause of pregnancy-related mortality. Deaths due to PE account for 9.2% of all pregnancy-related deaths or approximately 1.5 deaths per 100,000 live births (Abe, et al., 2019). Reductions in VTE and PE could save lives.

- **Groups With Disparities, 2020:**

  - Females in the self-pay/no charge group had higher rates of VTE/PE compared with females expected to pay with private insurance (0.38 vs. 0.28 per 1,000 delivery discharges).

Venous Thromboembolism or Pulmonary Embolism, by Location of Residence

Venous thromboembolism or pulmonary embolism per 1,000 delivery discharges, females ages 12-55, by location of patient residence, 2016-2020

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID), weighted to provide national estimates; and the AHRQ Quality Indicators, v2022.0. For more information, see the HCUP Methods Series Report on Methods Applying AHRQ Quality Indicators to HCUP Data (https://www.hcup-us.ahrq.gov/reports/methods/methods.jsp).
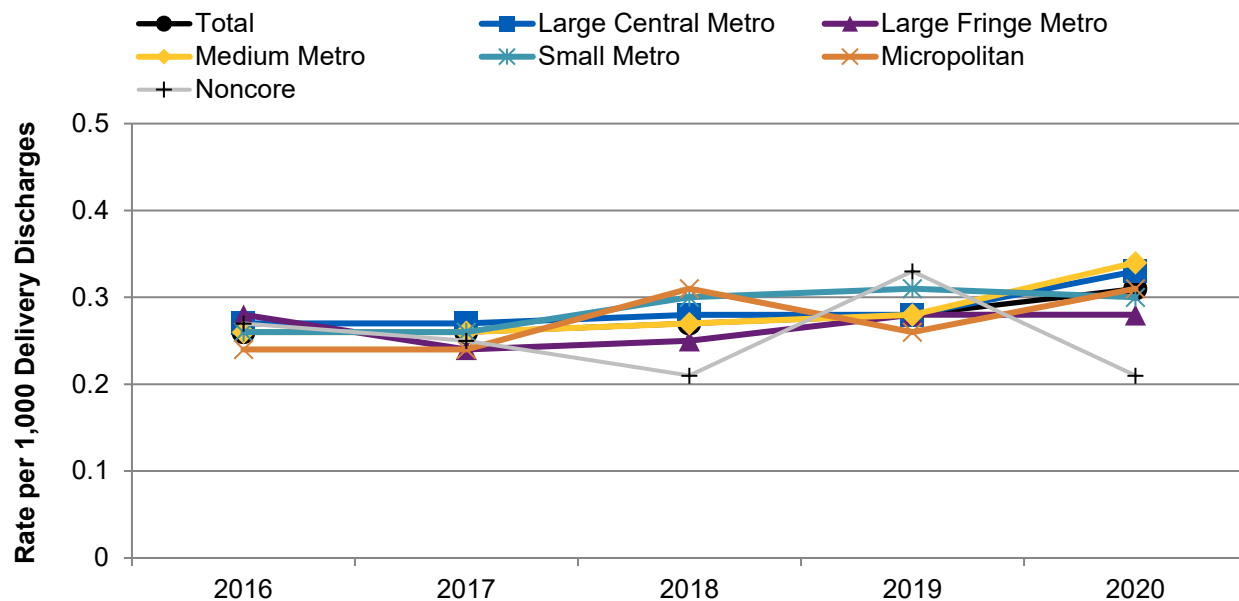**Denominator:** Includes deliveries with any delivery diagnosis, procedure, or diagnosis-related group and not abortion.
Note: For this measure, lower rates are better. The 2013 Urban–Rural Classification Scheme for Counties (https://www.cdc.gov/nchs/data/series/sr_02/sr02_166.pdf) has more information on location of residence.

- **Importance:** Venous thromboembolism (VTE), which includes deep vein thrombosis and pulmonary embolism (PE), is the development of blood clots. It is one cause of pregnancy-related mortality. Deaths due to PE account for 9.2% of all pregnancy-related deaths or approximately 1.5 deaths per 100,000 live births (Abe, et al., 2019). Reductions in VTE and PE could save lives.
- **Groups With Disparities, 2020:**

  - There were no statistically significant disparities for female patients experiencing VTE/PE by location of residence.

Cesarean Deliveries, by Race/Ethnicity

Cesarean deliveries per 1,000 deliveries, by race/ethnicity, 2016-2020

Key: API = Asian or Pacific Islander.
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID), weighted to provide national estimates; and the AHRQ Quality Indicators, v2022.0. For more information, see the HCUP Methods Series Report on Methods Applying AHRQ Quality Indicators to HCUP Data (https://www.hcup-us.ahrq.gov/reports/methods/methods.jsp).
Note: For this measure, lower rates are better. White, Black, and API are non-Hispanic. Hispanic includes all races.

- **Importance:** Cesarean deliveries are associated with heightened levels of adverse events and complications for future pregnancies. Limiting cesarean deliveries in low-risk births is seen as an important part of reducing cesarean deliveries overall.
- **Overall Percentage:** In 2020, cesarean deliveries occurred at a rate of 281.9 per 1,000 deliveries.
- **Trends:** From 2016 to 2020, the rates of cesarean deliveries showed a slight decrease for all racial/ethnic groups. The disparity between Black patients and all other racial/ethnic groups widened over time.
- **Groups With Disparities, 2020:**

  - The rate of cesarean deliveries was higher for Black patients compared with White patients (328.1 vs. 269.9 per 1,000 deliveries).

Cesarean Deliveries, by Age

Cesarean deliveries per 1,000 deliveries, by age, 2016-2020

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID), weighted to provide national estimates; and the AHRQ Quality Indicators, v2022.0. For more information, see the HCUP Methods Series Report on Methods Applying AHRQ Quality Indicators to HCUP Data (https://www.hcup-us.ahrq.gov/reports/methods/methods.jsp).
Note: For this measure, lower rates are better.

- **Importance:** Cesarean deliveries are associated with heightened levels of adverse events and complications for future pregnancies. Limiting cesarean deliveries in low-risk births is seen as an important part of reducing cesarean deliveries overall.
- **Groups With Disparities, 2020:**

  - Patients ages 35-54 had higher rates of cesarean delivery than all other age groups, including patients ages 10-14, 15-17, 18-24, and 25-34 (371.0 vs. 146.0, 140.4, 217.1, and 281.4 per 1,000 deliveries, respectively).
  - Patients ages 15-17 had lower rates of cesarean delivery than patients ages 18-24 (140.4 vs. 217.1 per 1,000 deliveries).

Cesarean Deliveries, by Income

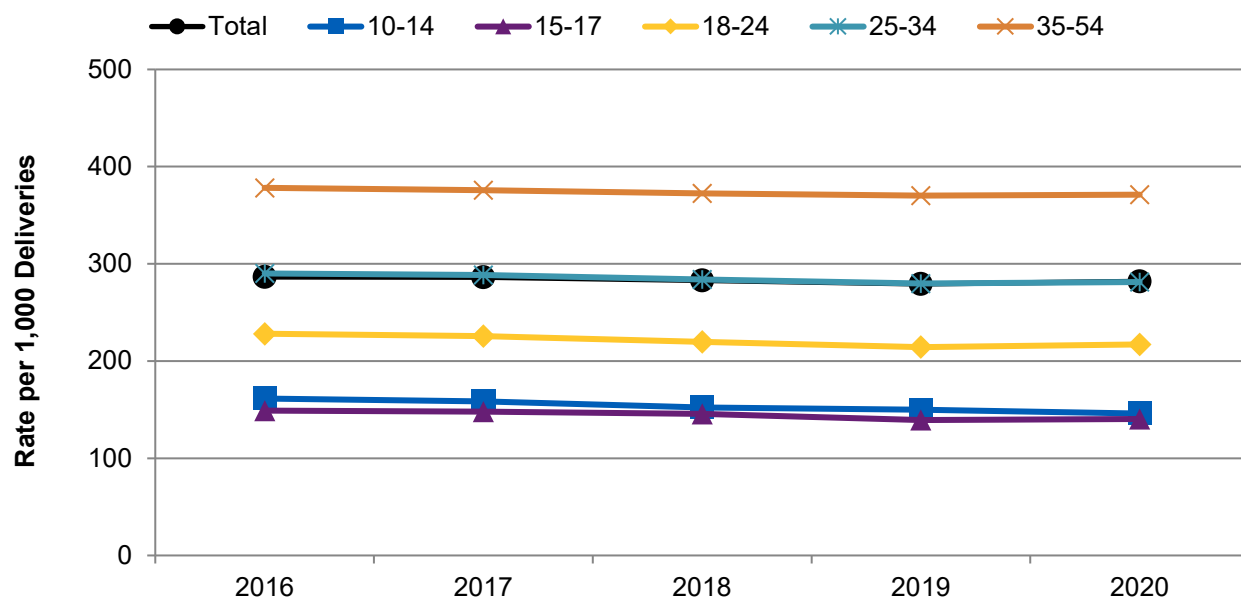**Cesarean deliveries per 1,000 deliveries, by median income of patient's ZIP Code, 2016-2020**

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID), weighted to provide national estimates; and the AHRQ Quality Indicators, v2022.0. For more information, see the HCUP Methods Series Report on Methods Applying AHRQ Quality Indicators to HCUP Data (https://www.hcup-us.ahrq.gov/reports/methods/methods.jsp).

Note: For this measure, lower rates are better. First Quartile indicates that the median household income of the patient's ZIP Code falls in the lowest quartile nationally. Fourth Quartile indicates that the median household income of the patient's ZIP Code falls in the highest quartile nationally. Income is based on the federal poverty guideline (PG): first quartile = <100% of PG; second quartile = 100-199% of PG; third quartile = 200-399% of PG; fourth quartile = 400%+ of PG.

- **Importance:** Cesarean deliveries are associated with heightened levels of adverse events and complications for future pregnancies. Limiting cesarean deliveries in low-risk births is seen as an important part of reducing cesarean deliveries overall.

- **Groups With Disparities, 2020:**

   - Patients residing in the first quartile (lowest income) area have higher rates of cesarean deliveries than patients living in an area with a median income in the third quartile (292.8 vs. 275.3 per 1,000 deliveries).

Cesarean Deliveries, by Payment Source

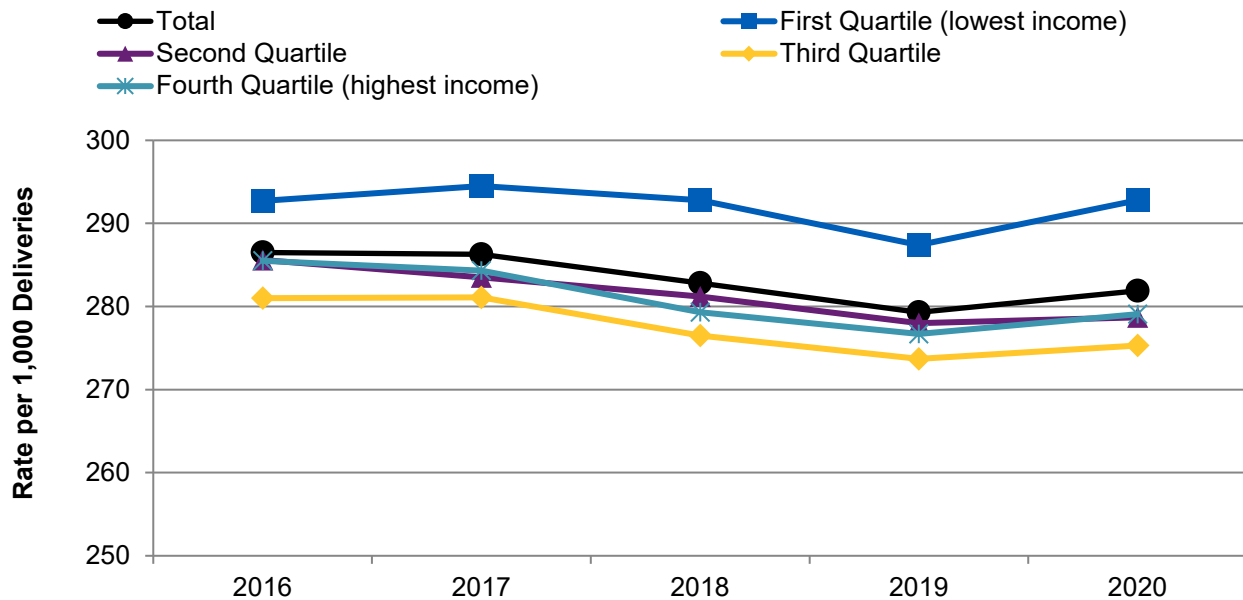**Cesarean deliveries per 1,000 deliveries, by expected payment source, 2016-2020**

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID), weighted to provide national estimates; and the AHRQ Quality Indicators, v2022.0. For more information, see the HCUP Methods Series Report on Methods Applying AHRQ Quality Indicators to HCUP Data (https://www.hcup-us.ahrq.gov/reports/methods/methods.jsp).

Note: For this measure, lower rates are better. Expected payment source indicates a patient's primary source of payment only. Medicare patients with a delivery diagnosis, procedure, or diagnosis-related group will have a preceding diagnosis of end-stage renal disease or another existing medical condition, increasing their risk of cesarean delivery and other adverse events.

- **Importance:** Cesarean deliveries are associated with heightened levels of adverse events and complications for future pregnancies. Limiting cesarean deliveries in low-risk births is seen as an important part of reducing cesarean deliveries overall.

- **Groups With Disparities, 2020:**

  - Patients in the self-pay/no charge group had lower rates of cesarean delivery than those with private insurance (253.0 vs. 285.0 per 1,000 deliveries).
  - Patients who were expected to pay with Medicare had higher rates of cesarean delivery than all other expected payment sources, including private insurance, Medicaid, other, and self-pay/no charge (361.9 vs. 285.0, 280.3, 256.3, and 253.0 per 1,000 deliveries, respectively).

Cesarean Deliveries, by Location of Residence

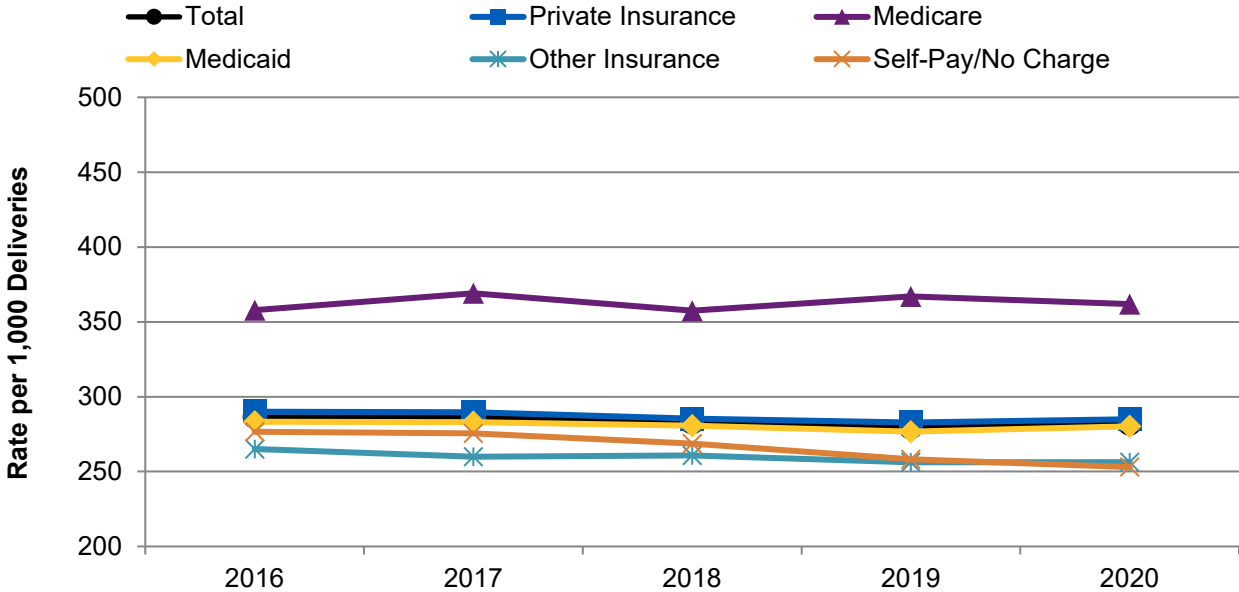**Cesarean deliveries per 1,000 deliveries, by location of patient residence, 2016-2020**
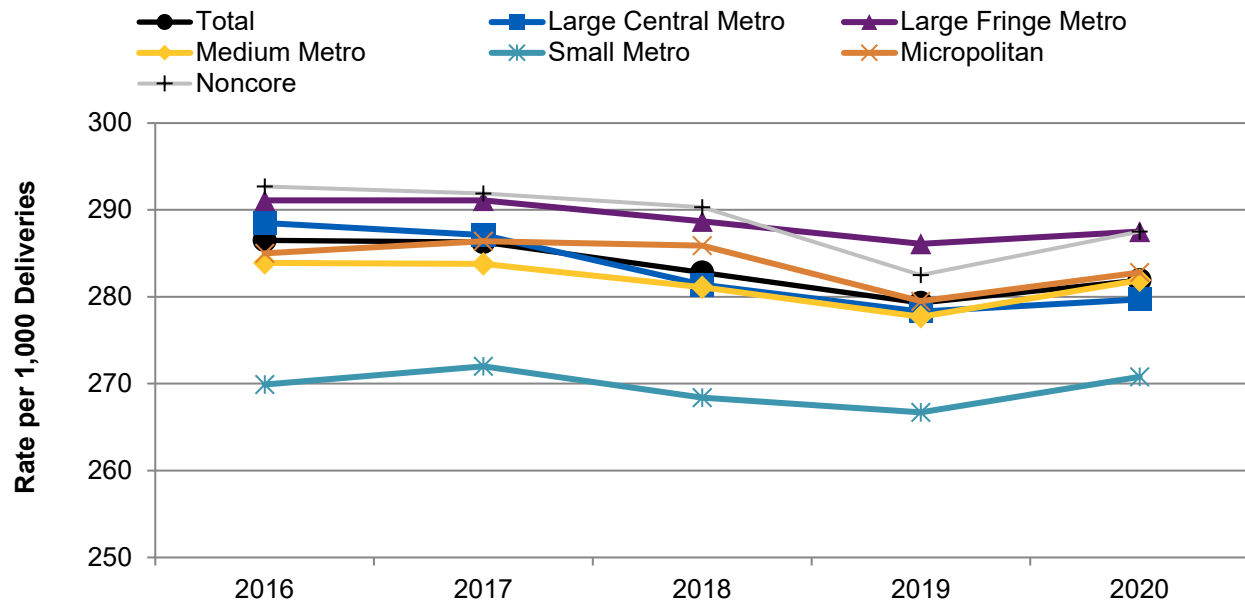

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID), weighted to provide national estimates; and the AHRQ Quality Indicators, v2022.0. For more information, see the HCUP Methods Series Report on Methods Applying AHRQ Quality Indicators to HCUP Data (https://www.hcup-us.ahrq.gov/reports/methods/methods.jsp).
Note: For this measure, lower rates are better. The 2013 Urban–Rural Classification Scheme for Counties (https://www.cdc.gov/nchs/data/series/sr_02/sr02_166.pdf) has more information on location of residence.

- **Importance:** Cesarean deliveries are associated with heightened levels of adverse events and complications for future pregnancies. Limiting cesarean deliveries in low-risk births is seen as an important part of reducing cesarean deliveries overall.
- **Groups With Disparities, 2020:**

  - Patients in noncore and large fringe metro areas had similar rates of cesarean deliveries (287.5 per 1,000 deliveries for both).
  - Patients residing in a small metro area had lower rates of cesarean delivery than those residing in large central metro areas (270.8 vs. 279.7 per 1,000 deliveries).

Resources: Perinatal Safety Toolkit

- AHRQ developed the Safety Program for Perinatal Care (SPPC) to improve the patient safety culture of labor and delivery units and decrease maternal and neonatal adverse events resulting from poor communication and system failures.
- The SPPC is organized around three program pillars:

  - Teamwork and Communication Skills
  - Perinatal Safety Strategies
  - In Situ Simulation Training

- The Toolkit for Improving Perinatal Safety is available online.

Adverse Drug Events

Adverse drug events are the most common nonsurgical adverse events to occur in hospitals (Weiss, 2013). The 2014 HHS National Action Plan for Adverse Drug Event Prevention targets three areas:

- Bleeding related to use of anticoagulants
- Hypoglycemia related to use of diabetes medications
- Accidental overdose, oversedation, and respiratory depression related to use of opioids

An adverse drug event (ADE) is an injury—including physical harm, mental harm, or loss of function—resulting from medical intervention involving a drug. More information is available in the Patient Safety Primer: Medication Errors and Adverse Drug Events.

Adverse drug event measures include:

- Adult inpatients who received a hypoglycemic agent who had adverse drug events with hypoglycemic agents.
- Adult inpatients who received intravenous heparin who had adverse drug events.
- Adult inpatients with an anticoagulant-related adverse drug event to low-molecular-weight heparin (LMWH), thrombin inhibitor, or factor Xa inhibitor.
- Adult inpatients with an adverse event within 24 hours following opioid administration.

Inpatients With Adverse Drug Events With Hypoglycemic Agents, by Race/Ethnicity

Adult inpatients who received a hypoglycemic agent who had adverse drug events with hypoglycemic agents, by race/ethnicity, 2021
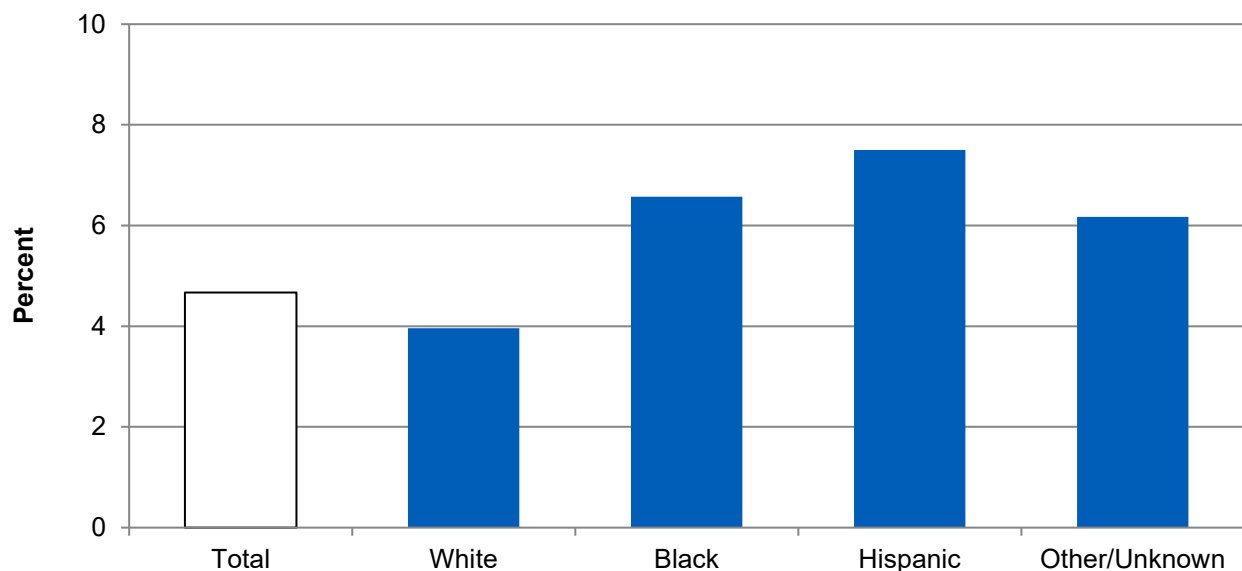
Source: Agency for Healthcare Research and Quality, Quality and Safety Review System, 2021.
Note: For this measure, lower percentages are better. Hypoglycemic agents received by patients age 18 and over during a hospital stay include insulin, oral hypoglycemic agents, or both. White and Black are non-Hispanic. Hispanic includes all races. Data do not meet the criteria for statistical reliability, data quality, or confidentiality for all other racial and ethnic groups.

- **Importance:** Hypoglycemic agents ingested by mouth are typically used in patients with type 2 diabetes to control blood sugar levels. In some cases, diabetic patients use hypoglycemic agents together with insulin. The risk of chronic kidney disease increases for people with diabetes, and renal impairment can increase the risk of adverse events related to hypoglycemic agents.
- **Groups With Disparities, 2021:**

  - Black, Hispanic, and other/unknown race hospital patients had a higher percentage of adverse drug events with hypoglycemic agents compared with White patients (6.6%, 7.5%, and 6.2%, respectively, vs. 4.0%).

Inpatients With Adverse Drug Events With Hypoglycemic Agents, by Sex

Adult inpatients who received a hypoglycemic agent who had adverse drug events with hypoglycemic agents, by sex, 2021

Source: Agency for Healthcare Research and Quality, Quality and Safety Review System, 2021.
Note: For this measure, lower percentages are better. Hypoglycemic agents received by patients age 18 and over during a hospital stay include insulin, oral hypoglycemic agents, or both.

- **Importance:** Hypoglycemic agents ingested by mouth are typically used in patients with type 2 diabetes to control blood sugar levels. In some cases, diabetic patients use hypoglycemic agents together with insulin. The risk of chronic kidney disease increases for people with diabetes, and renal impairment can increase the risk of adverse events related to hypoglycemic agents.
- **Groups With Disparities, 2021:**

  - There were no statistically significant disparities by sex in in the percentage of patients with adverse drug events with hypoglycemic agents.

Inpatients With Adverse Drug Events With Hypoglycemic Agents, by Obesity Status

Adult inpatients who received a hypoglycemic agent who had adverse drug events with hypoglycemic agents, by obesity status, 2021
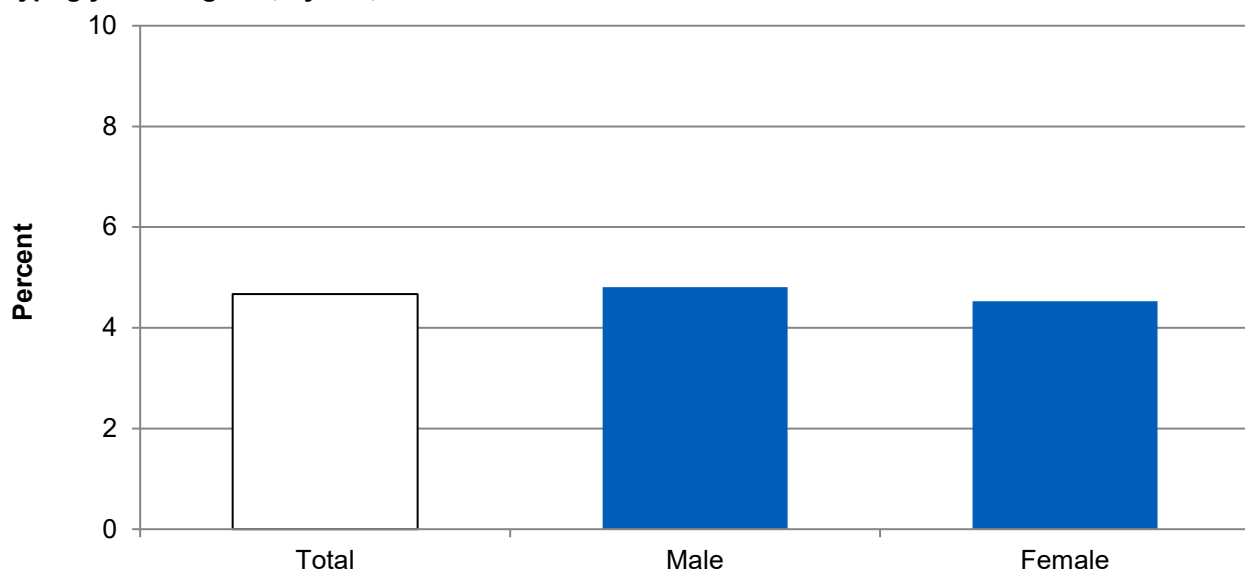

Source: Agency for Healthcare Research and Quality, Quality and Safety Review System, 2021.
Note: For this measure, lower percentages are better. Hypoglycemic agents received by patients age 18 and over during a hospital stay include insulin, oral hypoglycemic agents, or both.

- **Importance:** Hypoglycemic agents ingested by mouth are typically used in patients with type 2 diabetes to control blood sugar levels. In some cases, diabetic patients use hypoglycemic agents together with insulin. The risk of chronic kidney disease increases for people with diabetes, and renal impairment can increase the risk of adverse events related to hypoglycemic agents.
- **Groups With Disparities, 2021:**

  - Hospital patients diagnosed with obesity had a lower percentage of adverse drug events with hypoglycemic agents compared with patients without obesity (3.7% vs. 5.0%).

Inpatients With Adverse Drug Events With Hypoglycemic Agents, by Heart Failure Status

Adult inpatients who received a hypoglycemic agent who had adverse drug events with hypoglycemic agents, by heart failure status, 2021

Source: Agency for Healthcare Research and Quality, Quality and Safety Review System, 2021.
Note: For this measure, lower percentages are better. Hypoglycemic agents received by patients age 18 and over during a hospital stay include insulin, oral hypoglycemic agents, or both.

- **Importance:** Hypoglycemic agents ingested by mouth are typically used in patients with type 2 diabetes to control blood sugar levels. In some cases, diabetic patients use hypoglycemic agents together with insulin. The risk of chronic kidney disease increases for people with diabetes, and renal impairment can increase the risk of adverse events related to hypoglycemic agents.
- **Groups With Disparities, 2021:**

  - Hospital patients diagnosed with heart failure had a higher percentage of adverse drug events with hypoglycemic agents compared with patients without heart failure (5.0% vs. 4.5%).

Inpatients Who Received IV Heparin Who Had Adverse Drug Events, by Sex

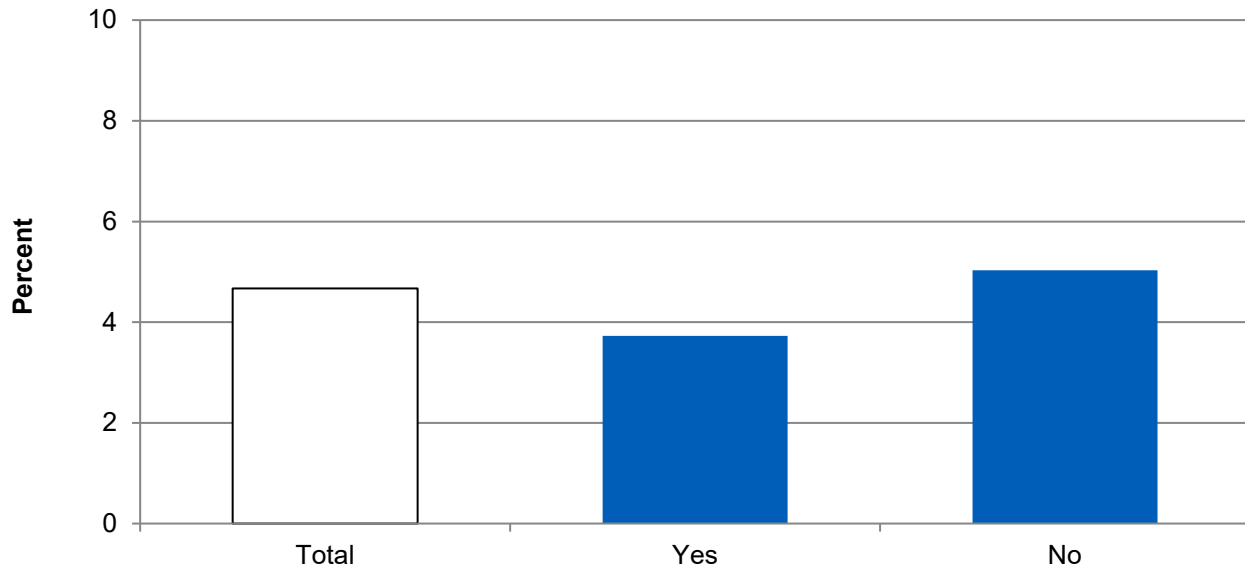**Adult inpatients who received intravenous heparin who had adverse drug events, by sex, 2021**
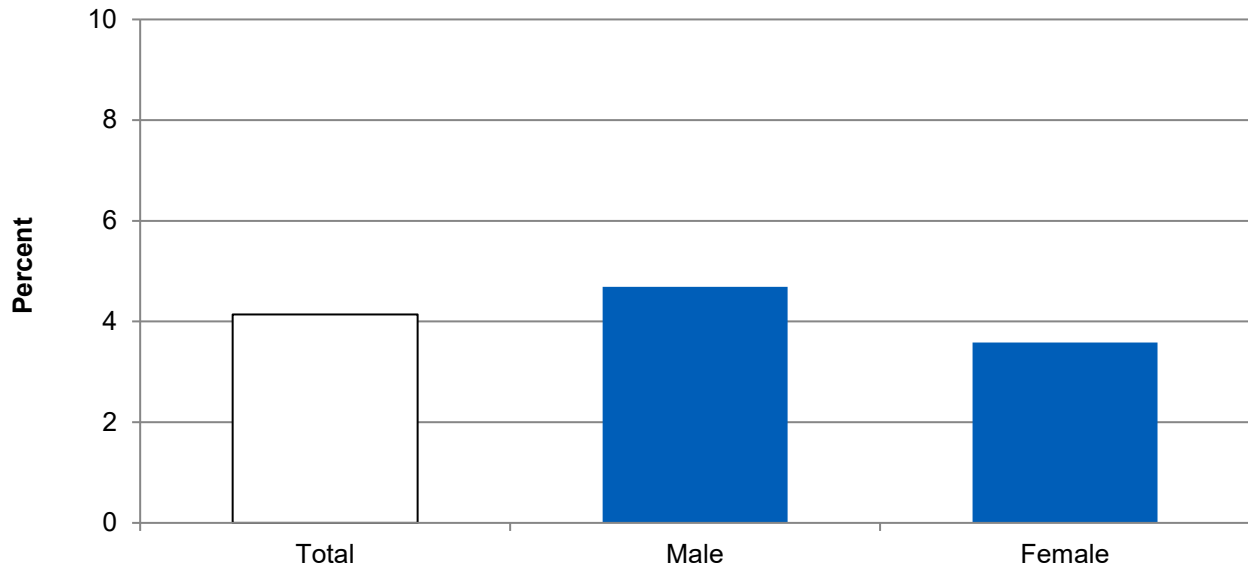
Source: Agency for Healthcare Research and Quality, Quality and Safety Review System, 2021.
Note: For this measure, lower percentages are better.

- **Importance:** Intravenous heparin is commonly used as an anticoagulant but some patients may experience adverse events.
- **Groups With Disparities, 2021:**

  - Male patients were more likely to experience adverse drug events with intravenous heparin than female patients (4.7% vs. 3.6%).

Inpatients Who Received IV Heparin Who Had Adverse Drug Events, by Obesity Status

Adult inpatients who received intravenous heparin who had adverse drug events, by obesity status, 2021
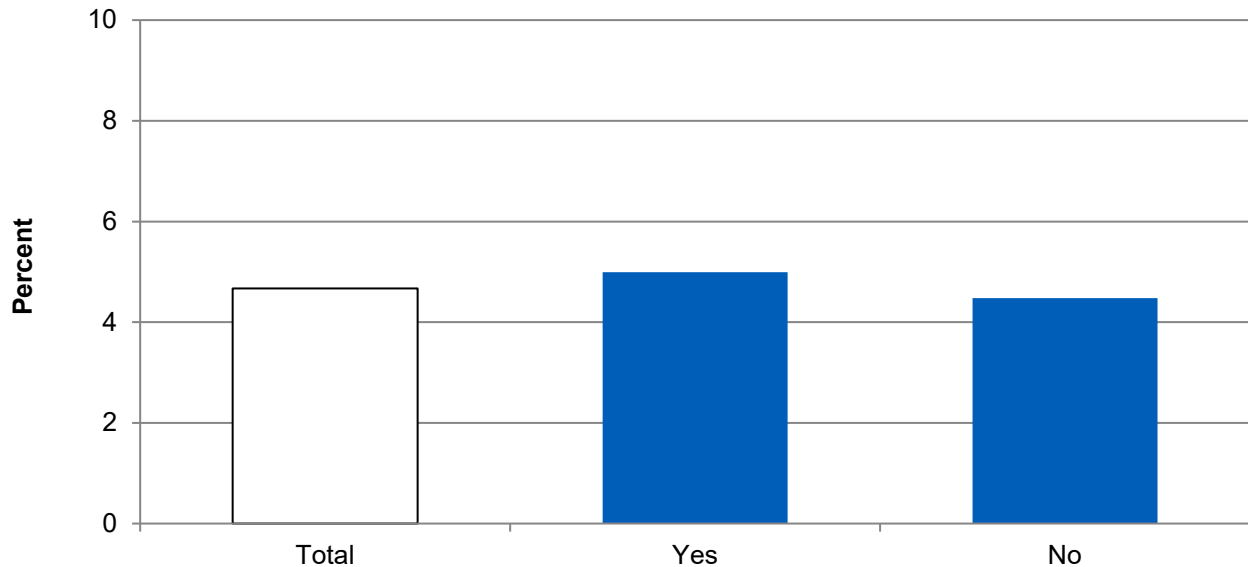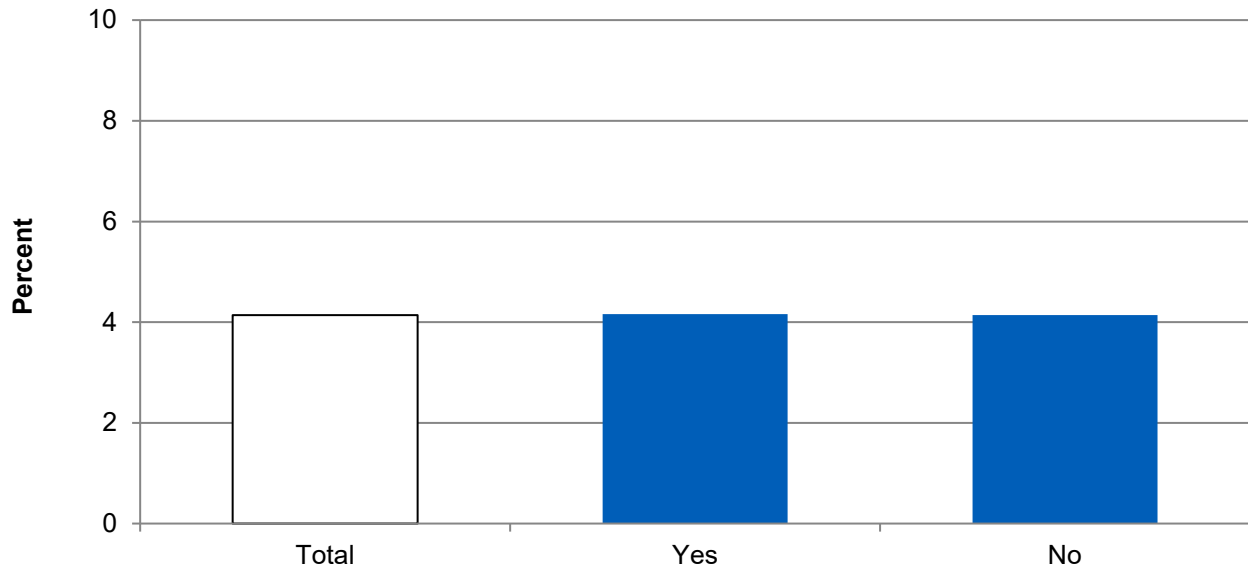

Source: Agency for Healthcare Research and Quality, Quality and Safety Review System, 2021.
Note: For this measure, lower percentages are better.

- **Importance:** Intravenous heparin is commonly used as an anticoagulant but some patients may experience adverse events.
- **Groups With Disparities, 2021:**

  - Adult patients with and without obesity experienced similar percentages of adverse drug events with intravenous heparin (4.2% and 4.1%, respectively).

Inpatients Who Received IV Heparin Who Had Adverse Drug Events , by Heart Failure Status

Adult inpatients who received intravenous heparin who had adverse drug events, by heart failure status, 2021
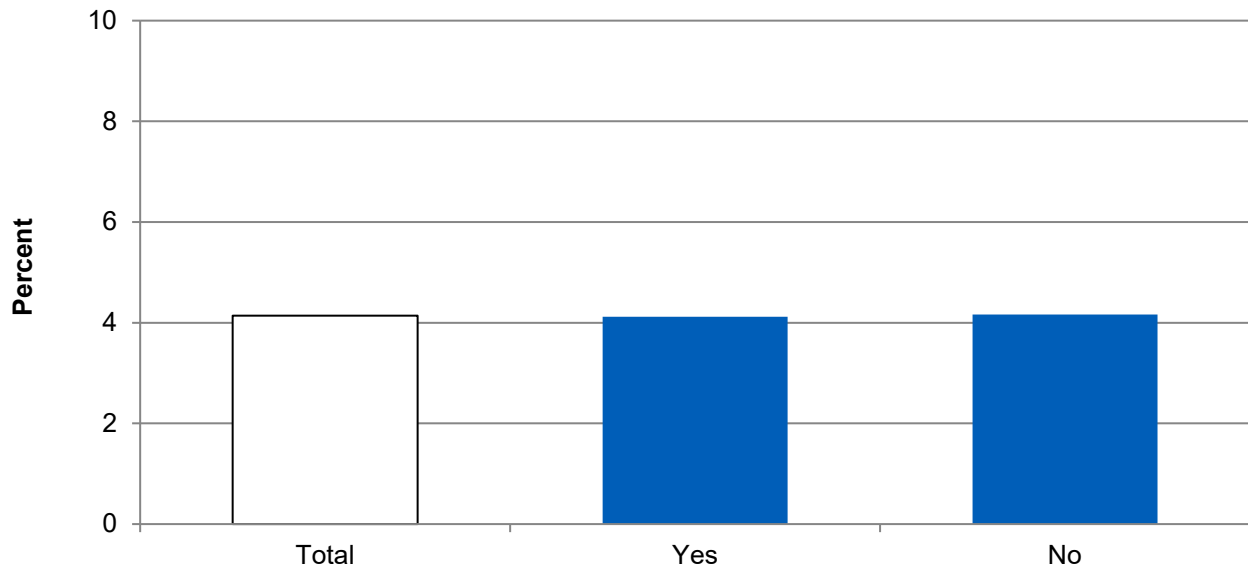
Source: Agency for Healthcare Research and Quality, Quality and Safety Review System, 2021.
Note: For this measure, lower percentages are better.

- **Importance:** Intravenous heparin is commonly used as an anticoagulant but some patients may experience adverse events.
- **Groups With Disparities, 2021:**

  - Adult patients with and without heart failure experienced similar percentages of adverse drug events with intravenous heparin (4.1% vs. 4.2%).

Adult Inpatients With Adverse Events With Heparin, Thrombin Inhibitor, or Factor Xa Inhibitor, by Sex

Adult inpatients with an anticoagulant-related adverse drug event to low-molecular-weight heparin (LMWH), thrombin inhibitor, or factor Xa inhibitor, by sex, 2021

Source: Agency for Healthcare Research and Quality, Quality and Safety Review System (QSRS), 2021.
Denominator: All patients from the QSRS sample who received LMWH, thrombin inhibitor, or factor Xa inhibitor during the index hospital stay.
Numerator: A subset of the denominator who experienced:

- Abrupt cessation/hold of LMWH, thrombin inhibitor, or factor Xa inhibitor with one of the following: cardiac arrest/emergency measures to sustain life, death, gastrointestinal bleeding, genitourinary bleeding, hematocrit drop of 3 or more points more than 48 hours after admission, intracranial bleeding (subdural hematoma), new hematoma, pulmonary bleeding, or other types of bleeding.
- Administration of protamine or fresh frozen plasma with one or more of the above symptoms.
- Blood transfusion (absent a surgical procedure) with one or more of the above symptoms.

Note: For this measure, lower percentages are better.

- **Importance:** Low-molecular-weight heparin (LMWH) and factor Xa inhibitors are widely used to prevent and treat venous thromboembolism and acute coronary syndromes. Although these drugs have been shown to improve outcomes, adverse events associated with bleeding remain a concern, and uncertainties remain about safety for specific patient populations, including pregnant women (Lim, 2010; Sobieraj, et al., 2012); and drug dosing in patients with chronic kidney disease may require adjustments (Lobo, 2007).
- **Groups With Disparities, 2021:**

  - There were no statistically significant disparities between male and female patients with adverse drug events with LMWH, thrombin inhibitor, or factor Xa inhibitors (0.42% vs. 0.4%).

Adult Inpatients With Adverse Events With Heparin, Thrombin Inhibitor, or Factor Xa Inhibitor, by Heart Failure Status

Adult inpatients with an anticoagulant-related adverse drug event to low-molecular-weight heparin (LMWH), thrombin inhibitor, or factor Xa inhibitor, by heart failure status, 2021

Source: Agency for Healthcare Research and Quality, Quality and Safety Review System (QSRS), 2021.
Denominator: All patients from the QSRS sample who received LMWH, thrombin inhibitor, or factor Xa inhibitor during the index hospital stay.
Numerator: A subset of the denominator who experienced:

- Abrupt cessation/hold of LMWH, thrombin inhibitor, or factor Xa inhibitor with one of the following: cardiac arrest/emergency measures to sustain life, death, gastrointestinal bleeding, genitourinary bleeding, hematocrit drop of 3 or more points more than 48 hours after admission, intracranial bleeding (subdural hematoma), new hematoma, pulmonary bleeding, or other types of bleeding.
- Administration of protamine or fresh frozen plasma with one or more of the above symptoms.
- Blood transfusion (absent a surgical procedure) with one or more of the above symptoms.

Note: For this measure, lower percentages are better.

- **Importance:** Low-molecular-weight heparin (LMWH) and factor Xa inhibitors are widely used to prevent and treat venous thromboembolism and acute coronary syndromes. Although these drugs have been shown to improve outcomes, adverse events associated with bleeding remain a concern, and uncertainties remain about safety for specific patient populations, including pregnant women (Lim, 2010; Sobieraj, et al., 2012); and drug dosing in patients with chronic kidney disease may require adjustments (Lobo, 2007).
- **Groups With Disparities, 2021:**

  - There were no statistically significant disparities between patients with and without heart failure for adverse drug events with LMWH, thrombin inhibitor, or factor Xa inhibitors (0.42% vs. 0.4%).

Adult Inpatients With Adverse Events With Heparin, Thrombin Inhibitor, or Factor Xa Inhibitor, by Obesity Status

Adult inpatients with an anticoagulant-related adverse drug event to low-molecular-weight heparin (LMWH), thrombin inhibitor, or factor Xa inhibitor, by obesity status, 2021

Source: Agency for Healthcare Research and Quality, Quality and Safety Review System (QSRS), 2021.
Denominator: All patients from the QSRS sample who received LMWH, thrombin inhibitor, or factor Xa inhibitor during the index hospital stay.
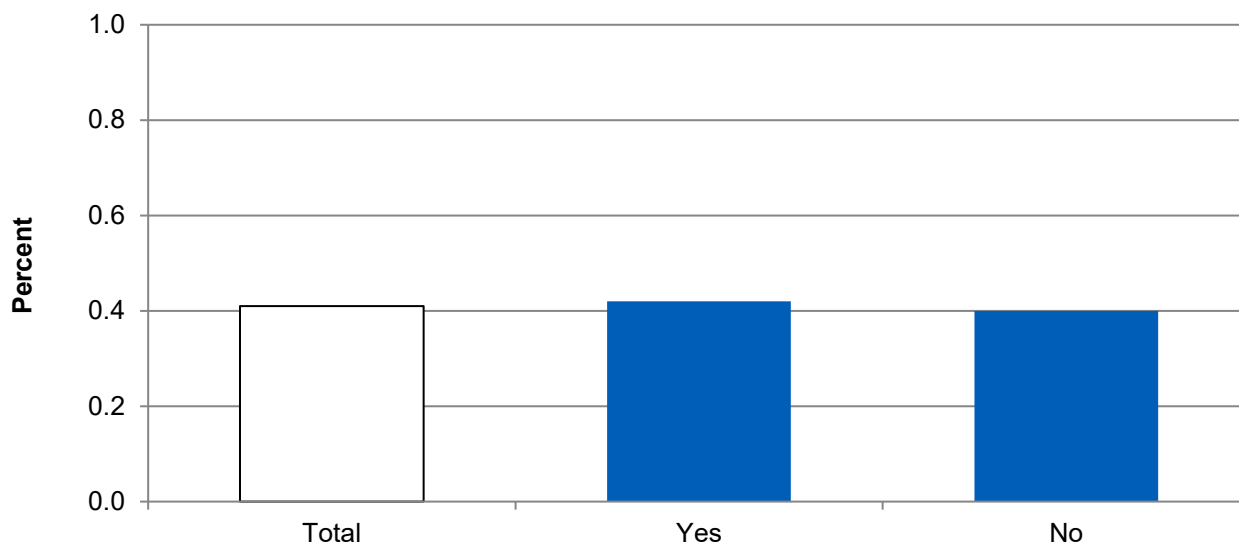**Numerator:** A subset of the denominator who experienced:

- Abrupt cessation/hold of LMWH, thrombin inhibitor, or factor Xa inhibitor with one of the following: cardiac arrest/emergency measures to sustain life, death, gastrointestinal bleeding, genitourinary bleeding, hematocrit drop of 3 or more points more than 48 hours after admission, intracranial bleeding (subdural hematoma), new hematoma, pulmonary bleeding, or other types of bleeding.
- Administration of protamine or fresh frozen plasma with one or more of the above symptoms.
- Blood transfusion (absent a surgical procedure) with one or more of the above symptoms.

Note: For this measure, lower percentages are better.

- **Importance:** Low-molecular-weight heparin (LMWH) and factor Xa inhibitors are widely used to prevent and treat venous thromboembolism and acute coronary syndromes. Although these drugs have been shown to improve outcomes, adverse events associated with bleeding remain a concern, and uncertainties remain about safety for specific patient populations, including pregnant women (Lim, 2010; Sobieraj, et al., 2012); and drug dosing in patients with chronic kidney disease may require adjustments (Lobo, 2007).
- **Groups With Disparities, 2021:**

  - Patients diagnosed with obesity were more likely to experience anticoagulant-related adverse events than those without (0.63% vs. 0.35%).

Inpatients With Adverse Events Following Opioid Administration, by Sex
Adult inpatients with an adverse event within 24 hours following opioid administration, by sex, 2021
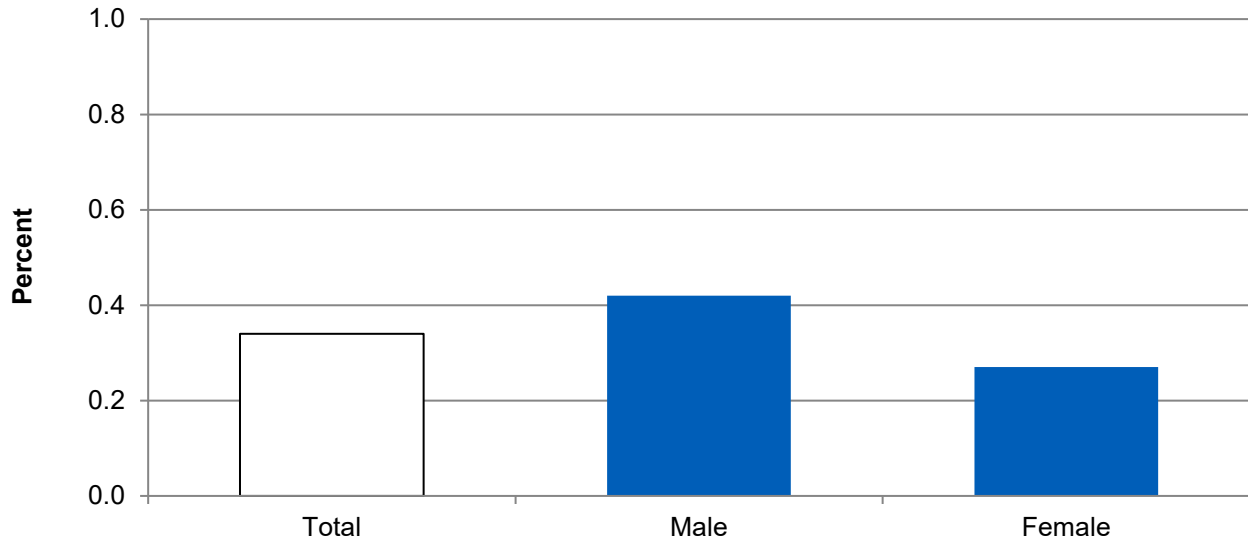
Source: Agency for Healthcare Research and Quality, Quality and Safety Review System, 2021.
Note: For this measure, lower percentages are better.

- **Groups With Disparities, 2021:**

  - Male and female patients experienced similar percentages of an adverse event within 24 hours following opioid administration (0.42% and 0.27%, respectively).

Inpatients With Adverse Events Following Opioid Administration, by Heart Failure Status
Adult inpatients with an adverse event within 24 hours following opioid administration, by heart failure status, 2021
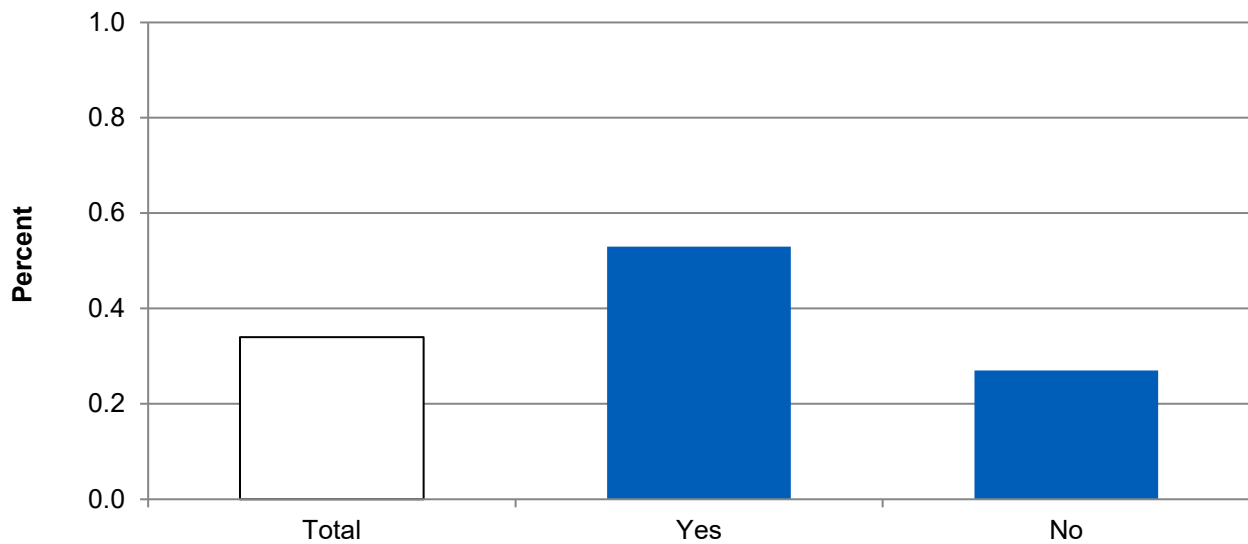
Source: Agency for Healthcare Research and Quality, Quality and Safety Review System, 2021.
Note: For this measure, lower percentages are better.

- **Groups With Disparities, 2021:**

  - Patients diagnosed with heart failure were more likely to experience an adverse event within 24 hours following opioid administration than patients without (0.53% vs. 0.27%).

Adverse Drug Event Prevention Resources

AHRQ offers several resources to improve the quality and safety of hospital care when using blood thinner medicines. These include:

- Blood Thinner Pills: Your Guide to Using Them Safely,
- AHRQ Six Building Blocks: A Team-Based Approach to Improving Opioid Management in Primary Care,
- Opioids in Older Adults Compendium, and
- Medications at Transitions and Clinical Handoffs (MATCH) Toolkit for Medication Reconciliation.

Visit AHRQ.gov for more tools and resources for hospital care.

Patient Safety in the Ambulatory Setting

Although patient safety initiatives frequently focus on inpatient hospital events, adverse effects of medical care may be identified and treated in outpatient settings. Ambulatory care is delivered in outpatient settings, or settings where patients are not admitted for care. Examples of ambulatory care settings include medical offices and clinics, ambulatory surgery centers, hospital outpatient departments, and dialysis centers.

Adverse effects of medical care can follow ambulatory care or procedures provided in hospitals, emergency departments, physician offices, or other settings. More information is available in the Patient Safety Primer: Ambulatory Care Safety.

In this section, measures address:

- Adults age 65 and over who received during the calendar year at least 1 of 33 potentially inappropriate prescription medications.
- Adults age 65 and over who received in the calendar year at least 1 of 11 prescription medications that should be avoided in older adults.

Older Adults Who Received 1 of 33 Inappropriate Medications, by Race/Ethnicity

Adults age 65 and over who received in the calendar year at least 1 of 33 potentially inappropriate prescription medications for older adults, by race/ethnicity, 2002-2020

Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2002-2020.
Note: For this measure, lower percentages are better. Prescription medications received includes all prescribed medications initially purchased or otherwise obtained during the calendar year, as well as any refills. The 33 medications include 11 drugs that should always be avoided and 22 medications that should often be avoided for older patients. For more information on inappropriate medications, refer to 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. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3571677/. White and Black are non-Hispanic. Hispanic includes all races. Data do not meet the criteria for statistical reliability, data quality, or confidentiality for all other racial and ethnic groups.

- **Importance:** Some drugs prescribed for older patients are known to be potentially harmful for this age group.
- **Overall Percentage:** In 2020, 10.2% of adults age 65 years and over received potentially inappropriate prescription medications.
- **Trends:** From 2002 to 2020, the percentage of adults age 65 years and over who received potentially inappropriate prescription medications improved overall and for all racial/ethnic groups.
- **Groups With Disparities, 2020:**

  - The percentage of adults age 65 years and over who received at least 1 of 33 prescription medications potentially inappropriate for older adults was higher for Black patients than Hispanic patients (10.8% vs. 6.8%).
  - The percentage of adults age 65 years and over who received at least 1 of 33 prescription medications potentially inappropriate for older adults was similar for Black and White patients (10.8% for both groups).

Older Adults Who Received 1 of 33 Inappropriate Medications, by Sex

Adults age 65 and over who received in the calendar year at least 1 of 33 potentially inappropriate prescription medications for older adults, by sex, 2002-2020

Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2002-2020.
Note: For this measure, lower percentages are better. Prescription medications received includes all prescribed medications initially purchased or otherwise obtained during the calendar year, as well as any refills. The 33 medications include 11 drugs that should always be avoided and 22 medications that should often be avoided for older patients. For more information on inappropriate medications, refer to 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. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3571677/. White and Black are non-Hispanic. Hispanic includes all races. Data do not meet the criteria for statistical reliability, data quality, or confidentiality for all other racial and ethnic groups.

- **Importance:** Some drugs prescribed for older patients are known to be potentially harmful for this age group.
- **Trends:** From 2002 to 2020, the percentage of adults age 65 years and over who received potentially inappropriate prescription medications improved overall and for both sexes.
- **Groups With Disparities, 2020:**

  - The percentage of female adults age 65 years and over receiving at least 1 of 33 prescription medications potentially inappropriate for older adults was higher than the percentage of male adults (11.5% vs. 8.6%).

- **Changes in Disparities:** In 2002, the percentage of patients receiving potentially inappropriate medications was higher among females than males. This gap has narrowed over time.
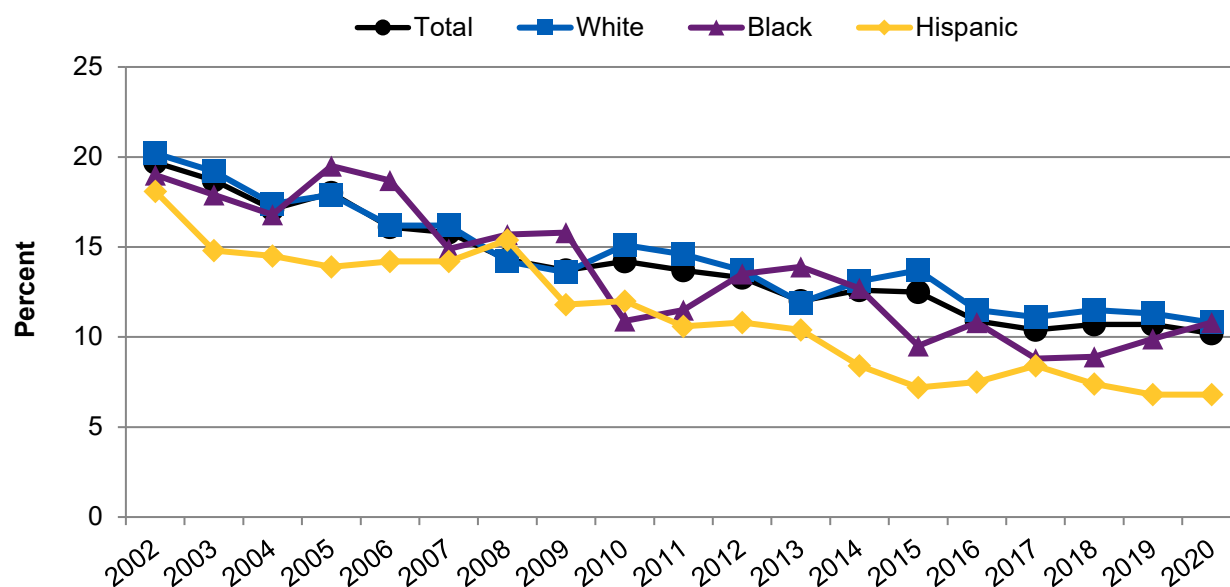
Older Adults Who Received 1 of 33 Inappropriate Medications, by Perceived Health Status

Adults age 65 and over who received in the calendar year at least 1 of 33 potentially inappropriate prescription medications for older adults, by perceived health status, 2002-2020
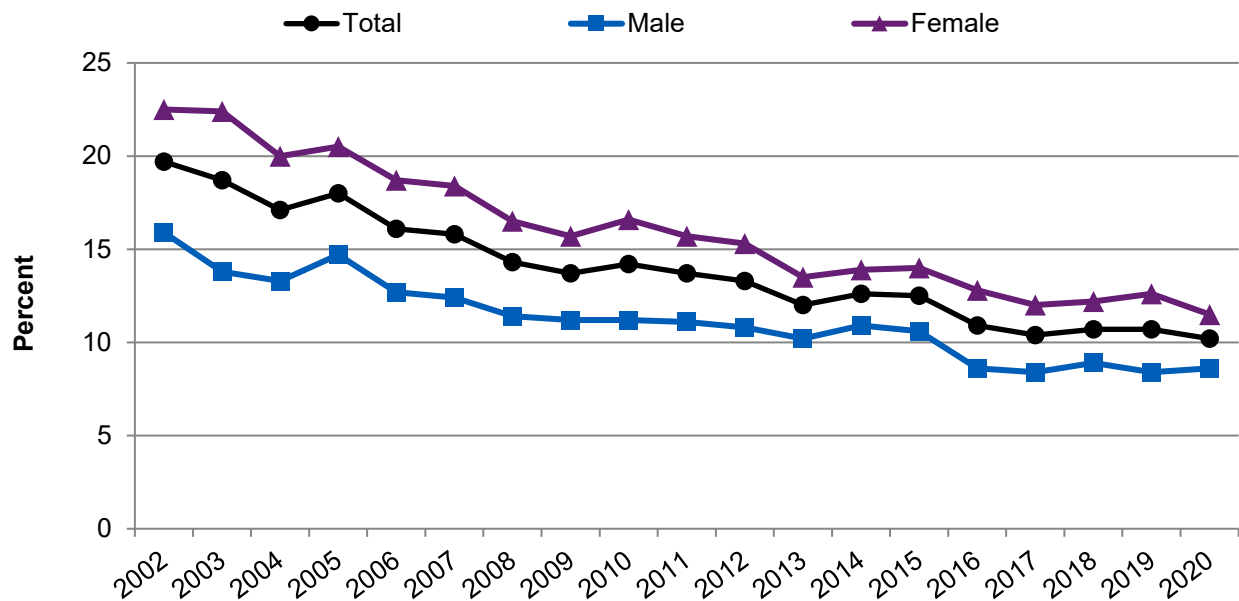

Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2002-2020.
Note: For this measure, lower percentages are better. Prescription medications received includes all prescribed medications initially purchased or otherwise obtained during the calendar year, as well as any refills. The 33 medications include 11 drugs that should always be avoided and 22 medications that should often be avoided for older patients. For more information on inappropriate medications, refer to 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. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3571677/. White and Black are non-Hispanic. Hispanic includes all races. Data do not meet the criteria for statistical reliability, data quality, or confidentiality for all other racial and ethnic groups.

- **Importance:** Some drugs prescribed for older patients are known to be potentially harmful for this age group.
- **Trends:** From 2002 to 2020, the percentage of adults age 65 years and over who received potentially inappropriate prescription medications improved overall and for both perceived health status groups.
- **Groups With Disparities, 2020:**

  - The percentage of patients receiving potentially inappropriate medications was higher among people with fair/poor health status compared with people with excellent/very good/good health status (15.6% vs. 9.0%).

Older Adults Who Received 1 of 11 Medications That Should Be Avoided, by Sex

Adults age 65 and over who received in the calendar year at least 1 of 11 prescription medications that should be avoided in older adults, by sex, 2002-2020
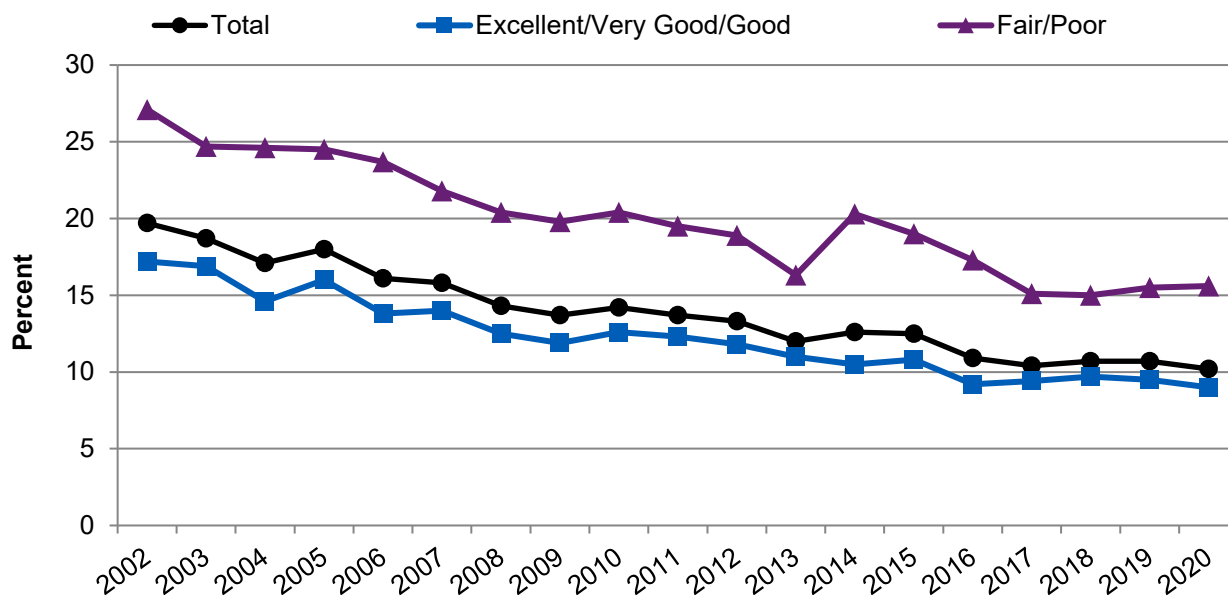

Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2002-2020.
Note: For this measure, lower percentages are better. Prescription medications received includes all prescribed medications initially purchased or otherwise obtained during the calendar year, as well as any refills. For more information on inappropriate medications, refer to 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. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3571677/. Data do not meet the criteria for statistical reliability, data quality, or confidentiality for the male group in 2013 and 2015-2017.

- **Importance:** Some drugs prescribed for older patients are known to be potentially harmful for this age group.
- **Overall Percentage:** In 2020, 1.4% of adults age 65 years and over received potentially inappropriate prescription medications.
- **Trends:** From 2002 to 2020, the percentage of adults age 65 years and over who received potentially inappropriate prescription medications improved overall and for both sexes.
- **Groups With Disparities, 2020:**

  - The percentage of female adults age 65 years and over receiving at least 1 of 11 prescription medications that should be avoided was higher than the percentage of male adults (1.8% vs. 0.8%).

- **Changes in Disparities:** In 2002, the percentage of patients receiving medications that should be avoided was higher among females than males. This gap has narrowed over time.

Older Adults Who Received 1 of 11 Medications That Should Be Avoided, by Perceived Health Status

Adults age 65 and over who received in the calendar year at least 1 of 11 prescription medications that should be avoided in older adults, by perceived health status, 2002-2020
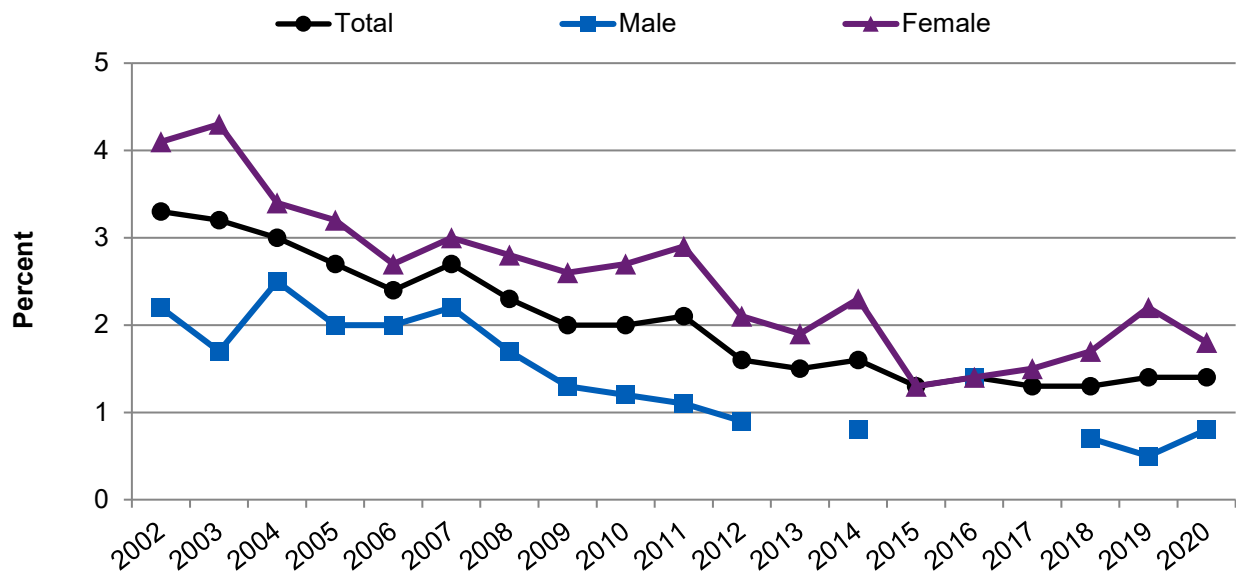

Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2002-2020.
Note: For this measure, lower percentages are better. Prescription medications received includes all prescribed medications initially purchased or otherwise obtained during the calendar year, as well as any refills. For more information on inappropriate medications, refer to 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. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3571677/. Data do not meet the criteria for statistical reliability, data quality, or confidentiality for the group fair/poor in 2015.

- **Importance:** Some drugs that are prescribed for older patients are known to be potentially harmful for this age group.
- **Groups With Disparities, 2020:**

  - The percentage of patients receiving medications that should be avoided was higher among people with fair/poor health status compared with people with excellent/very good/good health status (2.5% vs. 1.1%).

AHRQ Supported Resource To Improve Patient Safety in Ambulatory Settings

- **Tool:** Toolkit To Engage High-Risk Patients in Safe Transitions Across Ambulatory Settings
- **Purpose:** To actively engage patients and their care partners to prevent errors during transitions of care
- **Intended Users:** Primary care office managers and providers
- Available Tools:

  - Implementation guide
  - Preintervention assessment of current practices to identify gaps
  - Patient appointment aid to encourage patients to ask questions and communicate needs and preferences

- ■ Checklist for clinicians to help them prepare patients for new healthcare appointments
- ■ Educational training video for clinicians

- **Link:** https://www.ahrq.gov/hai/tools/ambulatory-care/safe-transitions.html

Patient safety measures that could be directly affected by implementation of this toolkit by ambulatory care providers include:

- Adults age 65 and over who received in the calendar year at least 1 of 11 prescription medications that should be avoided in older adults.
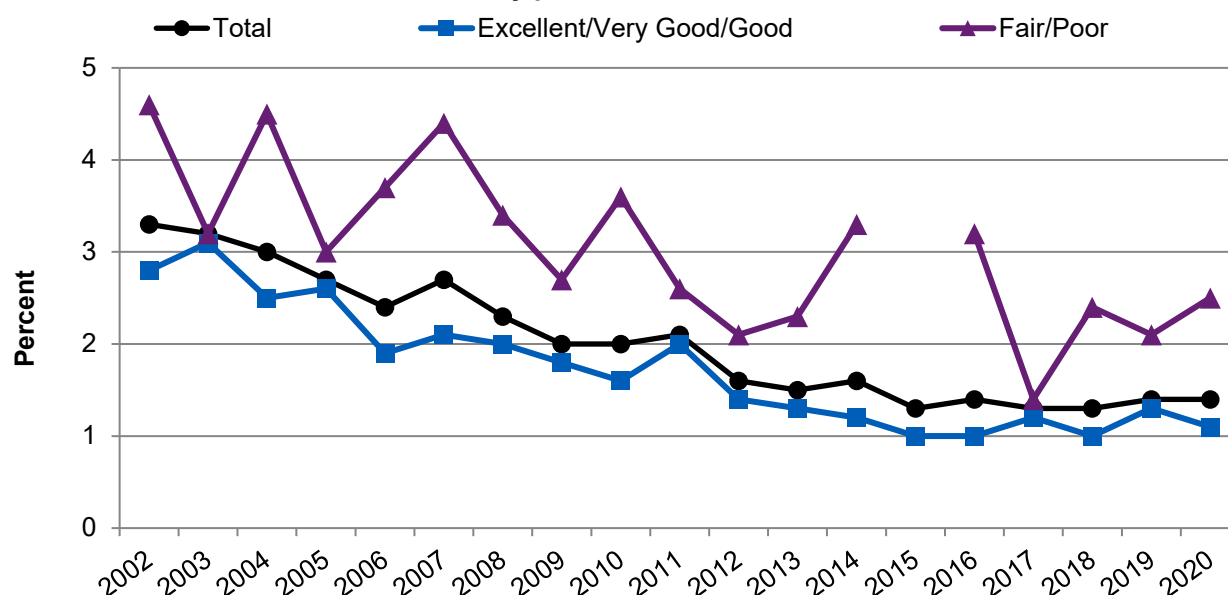- Adults age 65 and over who received in the calendar year at least 1 of 33 potentially inappropriate prescription medications for older adults.
- Short-stay home health patients who had drug education on all medications.

Patient safety measures that could be indirectly affected by implementation of this toolkit by ambulatory care providers who share information with home health care providers include:

- Adults who reported a home health care provider talking with them about all the prescription and over-the-counter medicines they were taking when they first started getting home health care.
- Adults who reported a home health care provider asking to see all the prescription and over-the-counter medicines they were taking when they first started getting home health care.
- Adults who reported that home health care providers talked with them about the purpose of taking their new or changed prescription medicines in the last 2 months of care.

Ambulatory Safety Resources

AHRQ offers several other resources to improve the quality and safety of ambulatory care, including:

- Medical Office Survey on Patient Safety Culture,
- TeamSTEPPS 3.0 and TeamSTEPPS for Diagnosis Improvement, and
- Toolkit To Improve Antibiotic Use in Ambulatory Care.

Visit AHRQ.gov for more tools and resources for ambulatory care.

Patient Safety in the Nursing Home Setting

Nursing homes, or skilled nursing facilities, provide a wide range of health and personal care services. Nursing home residents may stay for a short period of time, where they may receive rehabilitation after inpatient care, or in a long-term care facility where residents receive extended health and personal care. For nursing home residents, optimal care seeks to maximize quality of life and minimize unintended complications.

Estimates show that the United States has more than 15,000 nursing homes (Harris-Kojetin, et al., 2019). More than 1 million people receive care in U.S. nursing homes annually (KFF, 2019).

In this section, measures address:

- High-risk, long-stay nursing home patients with stages 2-4 pressure ulcer or unstageable pressure ulcer.
- Long-stay nursing home residents with a urinary tract infection.
- Long-stay nursing home residents experiencing one or more falls with major injury.
- Low-risk, long-stay nursing home residents with a catheter inserted and left in the bladder.

COVID-19 Impact on Data for Patient Safety in the Nursing Home Setting

Due to the COVID-19 public health emergency, CMS made optional and temporarily excepted providers from submission of the Minimum Data Set 3.0 (MDS). This exception applies to Assessment Data for quarter 4 of 2019 and quarters 1 and 2 of 2020. Discharges on or after July 1, 2020, may have missing MDS admission data. For more information on the impact of the COVID-19 public health emergency on data collection and analysis, view the CMS Extraordinary Circumstance Exceptions Policy.

Findings

Nursing Home Residents With Pressure Ulcers, by Race/Ethnicity

High-risk, long-stay nursing home patients with stage 2-4 pressure ulcer or unstageable pressure ulcer, by race/ethnicity, 2021

Key: AI/AN = American Indian or Alaska Native; NHPI = Native Hawaiian/Pacific Islander.
Source: Centers for Medicare & Medicaid Services, Skilled Nursing Facility Quality Reporting Program, Resident Assessment Files, Minimum Data Set 3.0.
Denominator: Medicare chronic care nursing home long-stay residents with a valid target assessment and with any of the following conditions on the target assessment: impaired in bed mobility or transfer, comatose, or suffering from malnutrition.
Numerator: Subset of the denominator with stage 2-4 pressure ulcer on target assessment.
Note: For this measure, lower percentages are better. White, Black, Asian, AI/AN, and NHPI are non-Hispanic. Hispanic includes all races. Data reflect care for the latest episode of a beneficiary in the calendar year.

- **Importance:** Pressure ulcers are an important clinical problem for nursing home residents and a major quality issue for facilities. In addition, many people sue over wounds, which is costly for nursing homes and poses a significant legal risk. More importantly, pressure ulcers lower quality of life and increase morbidity and mortality rates (Au, et al., 2019), which can affect some populations more than others. One study found higher rates of pressure ulcers in Black male residents (Seibert, et al., 2020).
- **Overall Percentage:** In 2021, 6.9% of long-stay nursing home residents who were impaired in bed mobility or transfer, comatose, or suffering from malnutrition at the time of an assessment were experiencing a stage 2-4 pressure ulcer or an unstageable pressure ulcer.
- **Groups With Disparities, 2021:**

  - Black nursing home patients were more likely than White and Asian patients to have a pressure ulcer (9.5% vs. 6.3% and 5.3%, respectively).
  - AI/AN nursing home patients were more likely than White and Asian patients to have a pressure ulcer (8.2% vs. 6.3% and 5.3%, respectively).

Nursing Home Residents With Pressure Ulcers, by Sex

High-risk, long-stay nursing home patients with stage 2-4 pressure ulcer or unstageable pressure ulcer, by sex, 2021

Source: Centers for Medicare & Medicaid Services, Skilled Nursing Facility Quality Reporting Program, Resident Assessment Files, Minimum Data Set 3.0.
Denominator: Medicare chronic care nursing home long-stay residents with a valid target assessment and with any of the following conditions on the target assessment: impaired in bed mobility or transfer, comatose, or suffering from malnutrition.
Numerator: Subset of the denominator with stage 2-4 pressure ulcer on target assessment.
Note: For this measure, lower percentages are better. Data reflect care for the latest episode of a beneficiary in the calendar year.

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- **Groups With Disparities, 2021:**

    ■ Female nursing home residents were less likely than male residents to have a pressure ulcer (6.2% vs. 8.3%).

Nursing Home Residents With a Urinary Tract Infection, by Race/Ethnicity
Long-stay nursing home residents with a urinary tract infection, by race/ethnicity, 2013-2021

Key: AI/AN = American Indian or Alaska Native; NHPI = Native Hawaiian/Pacific Islander.
Source: Centers for Medicare & Medicaid Services, Skilled Nursing Facility Quality Reporting Program, Resident Assessment Files, Minimum Data Set 3.0, 2013-2021.
Denominator: Medicare chronic care nursing home long-stay residents with a valid target assessment, excluding admission assessments and target assessments with missing values.
Numerator: Subset of the denominator where a urinary tract infection was reported on the target assessment within the last 30 days.
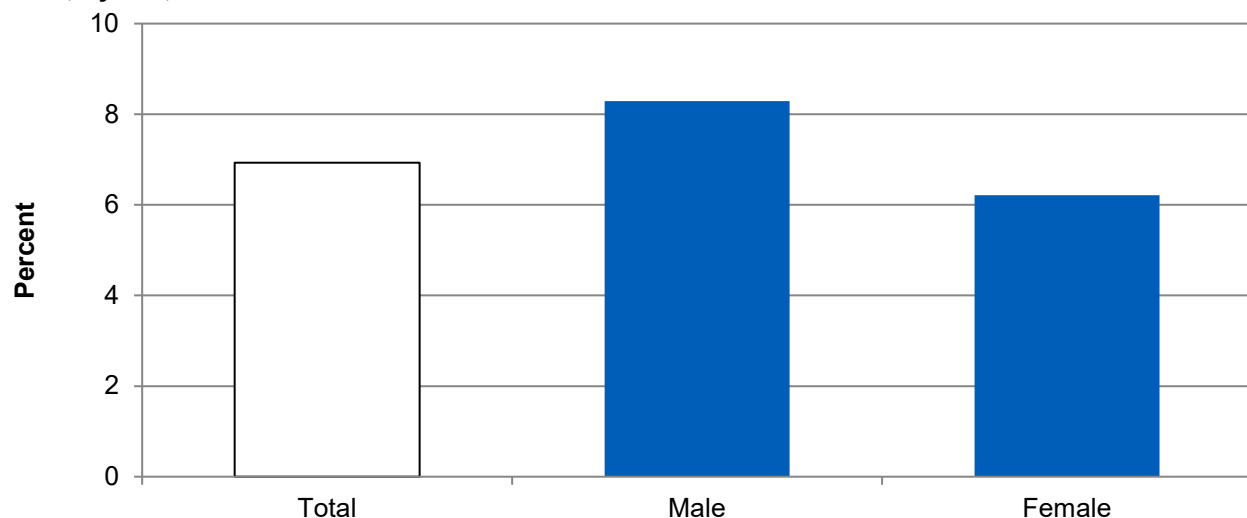**Note:** For this measure, lower percentages are better. White, Black, Asian, AI/AN, and NHPI are non-Hispanic. Hispanic includes all races. Data reflect care for the latest episode of a beneficiary in the calendar year. Shaded area indicates data impacted by the COVID-19 public health emergency.

- **Importance:** A UTI, particularly a CAUTI, is an example of a preventable infection that occurs in many long-term care facilities. Several national, state, and local programs, including AHRQ's Safety Program for Long-Term Care: HAIs/CAUTI, have worked to bring quality and safety tools to nursing homes in an effort to reduce these infections. While infection rates for most populations have declined, racial, ethnic, and sex disparities persist.
- **Overall Percentage:** In 2021, 1.7% of long-stay nursing home residents had a UTI within the 30 days prior to assessment.
- **Trends:** From 2013 to 2021, the percentage of long-stay nursing home residents with a UTI declined (improved) overall and for all racial/ethnic groups.
- **Groups With Disparities, 2021:**

    ■ Black, Asian, NHPI, and Hispanic nursing home residents were less likely than White residents to have a UTI (1.2%, 0.9%, 1.1%, and 1.0%, respectively, vs. 1.9%)

- AI/AN and White nursing home residents experienced similar percentages of UTI (2.0% and 1.9%, respectively).

Nursing Home Residents With a Urinary Tract Infection, by Sex
Long-stay nursing home residents with a urinary tract infection, by sex, 2013-2021

Source: Centers for Medicare & Medicaid Services, Skilled Nursing Facility Quality Reporting Program, Resident Assessment Files, Minimum Data Set 3.0, 2013-2021.
Denominator: Medicare chronic care nursing home long-stay residents with a valid target assessment, excluding admission assessments and target assessments with missing values.
Numerator: Subset of the denominator where a urinary tract infection was reported on the target assessment within the last 30 days.
Note: For this measure, lower percentages are better. Data reflect care for the latest episode of a beneficiary in the calendar year. Shaded area indicates data impacted by the COVID-19 public health emergency.
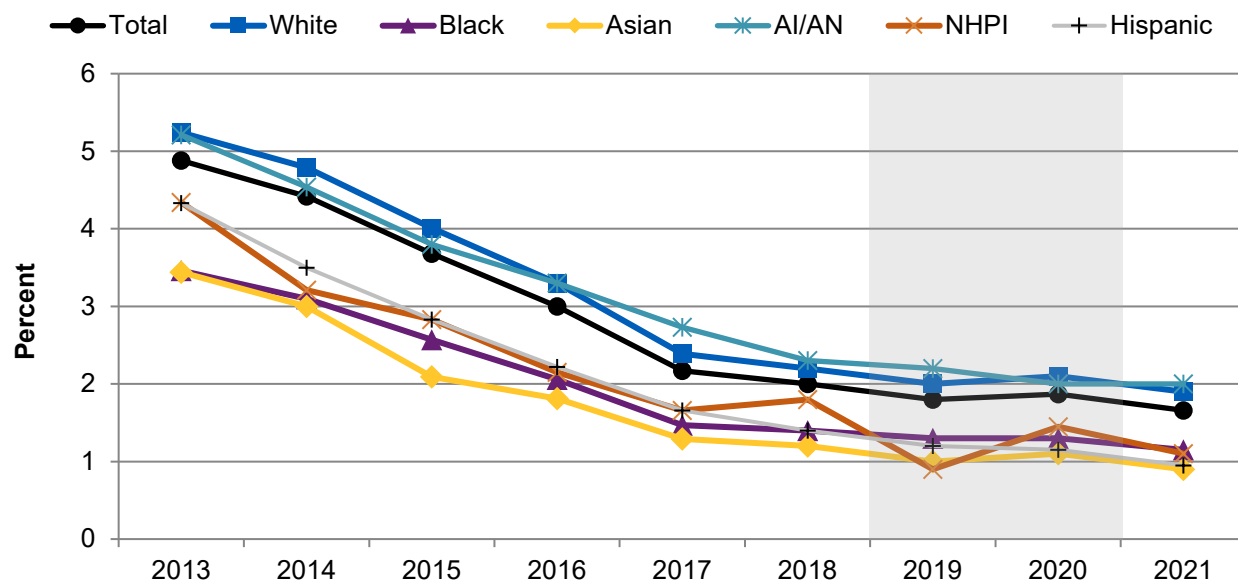
- **Importance:** A UTI, particularly a CAUTI, is an example of a preventable infection that occurs in many long-term care facilities. Several national, state, and local programs, including AHRQ's Safety Program for Long-Term Care: HAIs/CAUTI, have worked to bring quality and safety tools to nursing homes in an effort to reduce these infections. While infection rates for most populations have declined, racial, ethnic, and sex disparities persist.
- **Trends:** From 2013 to 2021, the percentage of long-stay nursing home residents with a UTI declined (improved) overall and for both sexes.
- **Groups With Disparities, 2021:**

  - Female nursing home residents were more likely than male residents to have a UTI (1.9% vs. 1.3%).
  - Female residents were also more likely than male residents to have a UTI in 2013, but this disparity has narrowed (improved) over time.

Falls Among Nursing Home Residents, by Race/Ethnicity

Long-stay nursing home residents experiencing one or more falls with major injury, by race/ethnicity, 2013-2021
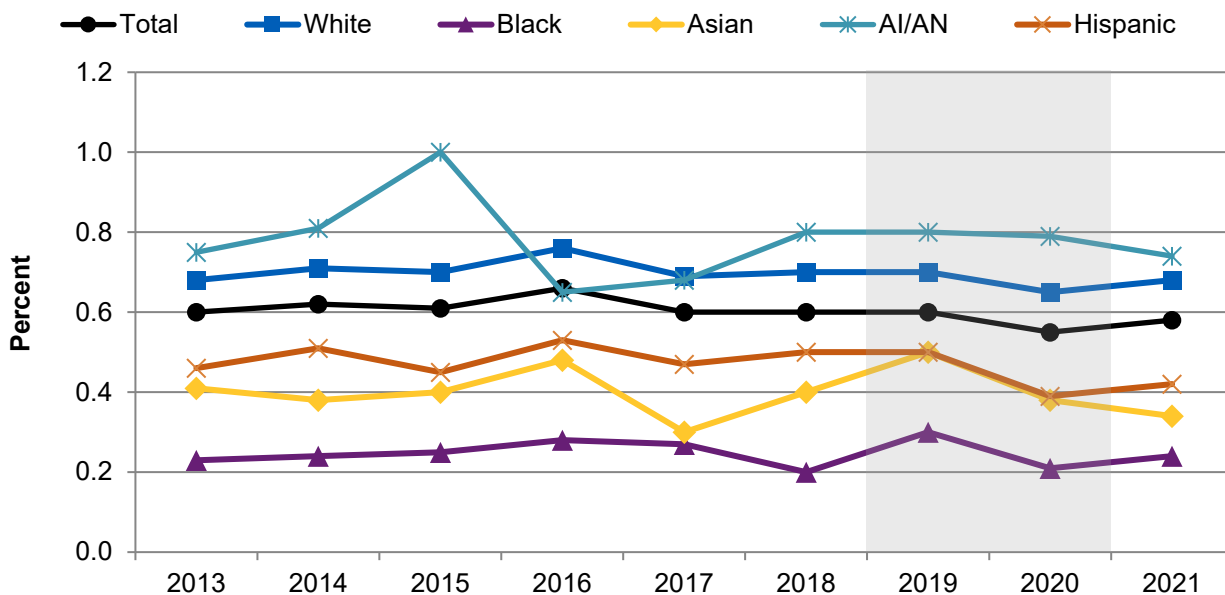
Key: AI/AN = American Indian or Alaska Native.
Source: Centers for Medicare & Medicaid Services, Skilled Nursing Facility Quality Reporting Program, Resident Assessment Files, Minimum Data Set 3.0, 2013-2021.
Denominator: Medicare chronic care nursing home long-stay residents with a valid target assessment; excludes residents who were not assessed for a fall or where the number of falls was not assessed.
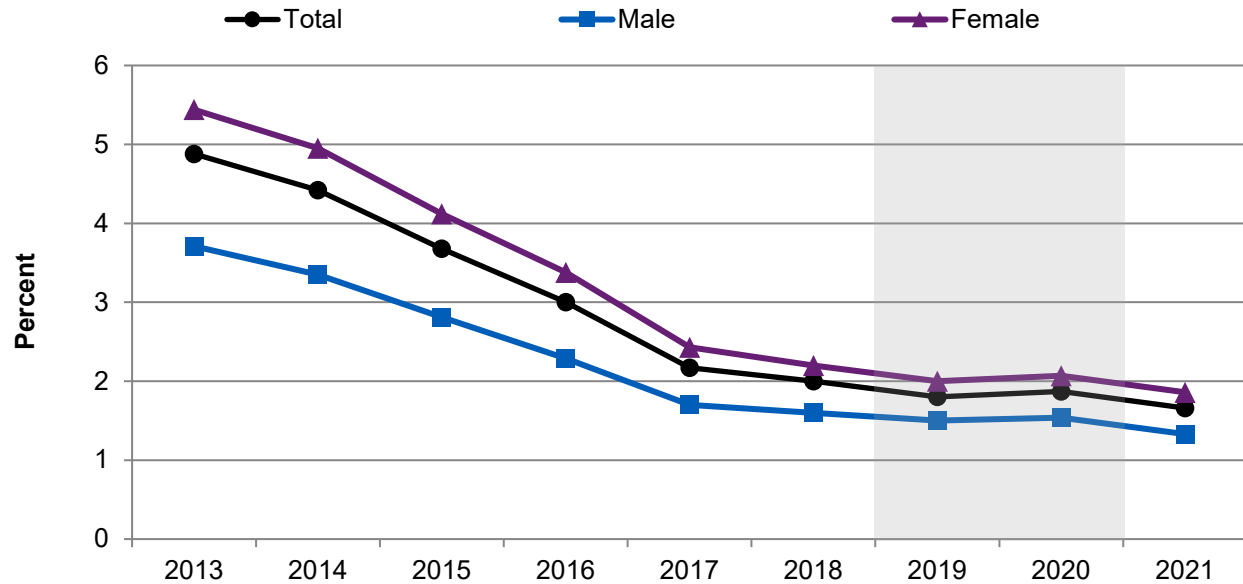**Note:** For this measure, lower percentages are better. White, Black, Asian, and AI/AN are non-Hispanic. Hispanic includes all races. Data for Native Hawaiian/Pacific Islanders do not meet the criteria for statistical reliability, data quality, or confidentiality and are not included. Data reflect care for the latest episode of a beneficiary in the calendar year. Shaded area indicates data impacted by the COVID-19 public health emergency.

- **Importance:** In 2012, it was estimated that almost 530,000 residents in U.S. nursing homes fell every year. Moreover, one-third experienced more than two falls annually (AHRQ, 2017). Research by Sanghavi, et. al. (2020), showed that reporting for falls in White adults was higher than non-White adults when not controlling for facility-level and racial characteristics.
- **Overall Percentage:** In 2021, 0.58% of long-stay nursing home residents with a valid target assessment experienced one or more falls with major injury.
- **Trends:** From 2013 to 2021, there was no statistically significant change overall or for any racial/ethnic group in the percentage of long-stay nursing home residents with a valid target assessment who experienced one or more falls with major injury.
- **Groups With Disparities, 2021:**

  - Black residents were less likely than White and AI/AN residents to have experienced a fall with major injury (0.24% vs. 0.68% and 0.74%, respectively).

Falls Among Nursing Home Residents, by Sex

Long-stay nursing home residents experiencing one or more falls with major injury, by sex, 2013-2021

Source: Centers for Medicare & Medicaid Services, Skilled Nursing Facility Quality Reporting Program, Resident Assessment Files, Minimum Data Set 3.0, 2013-2021.

Denominator: Medicare chronic care nursing home long-stay residents with a valid target assessment; excludes residents who were not assessed for a fall or where the number of falls was not assessed.

Note: For this measure, lower percentages are better. Data reflect care for the latest episode of a beneficiary in the calendar year. Shaded area indicates data impacted by the COVID-19 public health emergency.

- **Importance:** In 2012, it was estimated that almost 530,000 residents in U.S. nursing homes fell every year. Moreover, one-third experienced more than two falls annually (AHRQ, 2017). Research by Sanghavi, et. al. (2020), showed that reporting for falls in White adults was higher than non-White adults when not controlling for facility-level and racial characteristics.
- **Trends:** From 2013 to 2021, there was no statistically significant change in the percentage of long-stay nursing home residents with a valid target assessment who experienced one or more falls with major injury overall and for both sexes.
- **Groups With Disparities, 2021:**

  - Female nursing home residents were more likely than male residents to have experienced a fall with major injury (0.68% vs. 0.42%).

Nursing Home Residents With a Catheter Inserted and Left in the Bladder, by Race/Ethnicity

Low-risk, long-stay nursing home residents with a catheter inserted and left in the bladder, by race/ethnicity, 2013-2021

Key: AI/AN = American Indian or Alaska Native; NHPI = Native Hawaiian/Pacific Islander.
Source: Centers for Medicare & Medicaid Services, Skilled Nursing Facility Quality Reporting Program, Resident Assessment Files, Minimum Data Set 3.0, 2013-2021.
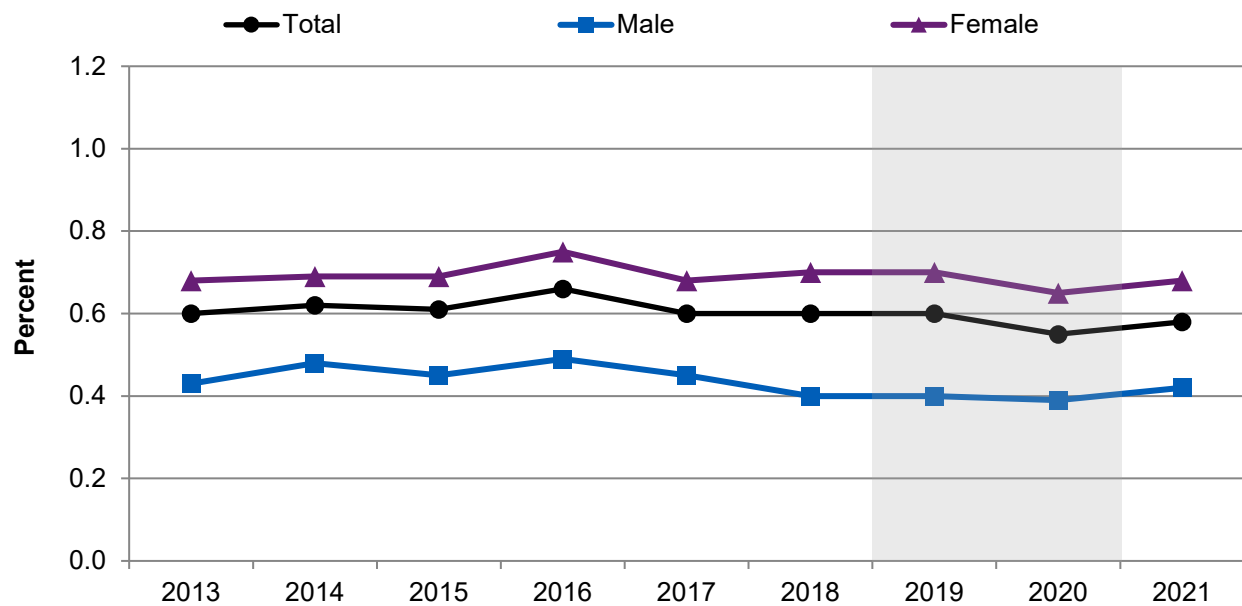**Denominator:** Medicare chronic care nursing home long-stay residents with a valid target assessment, excluding admission assessments or assessments with missing data.
Numerator: Subset of the denominator with indwelling catheters on target assessment.
Note: For this measure, lower percentages are better. Data reflect care for the latest episode of a beneficiary in the calendar year. Shaded area indicates data impacted by the COVID-19 public health emergency.

- **Importance:** Long-term catheter use can lead to UTIs. This safety issue provides the rationale for the quality indicator "catheter left in bladder" publicly reported by nursing homes via the CMS website (Simmons, et al., 2016). Infection prevention strategies include:

  - Minimizing catheter use in general and avoiding catheter use for incontinent residents;
  - Training staff in proper techniques for urinary catheter insertion;
  - Using a closed urinary drainage system;
  - Using external catheters instead of indwelling catheters when possible;
  - Documenting key information related to urinary catheter use; and
  - Providing stop orders or reminders to remove such catheters.

- **Overall Percentage:** In 2021, 2.8% of low-risk, long-stay nursing home residents had a catheter inserted and left in the bladder at the time of assessment.
- **Trends:** Between 2013 and 2021, the percentage of low-risk, long-stay nursing home residents with a catheter inserted and left in the bladder showed no statistically significant improvement overall or for any racial/ethnic group.

- **Groups With Disparities, 2021:**

  - AI/AN nursing home residents were more likely than Asian residents to have had a catheter inserted and left in the bladder (3.1% vs. 2.0%).

Nursing Home Residents With a Catheter Inserted and Left in the Bladder, by Sex
Low-risk, long-stay nursing home residents with a catheter inserted and left in the bladder, by sex, 2013-2021
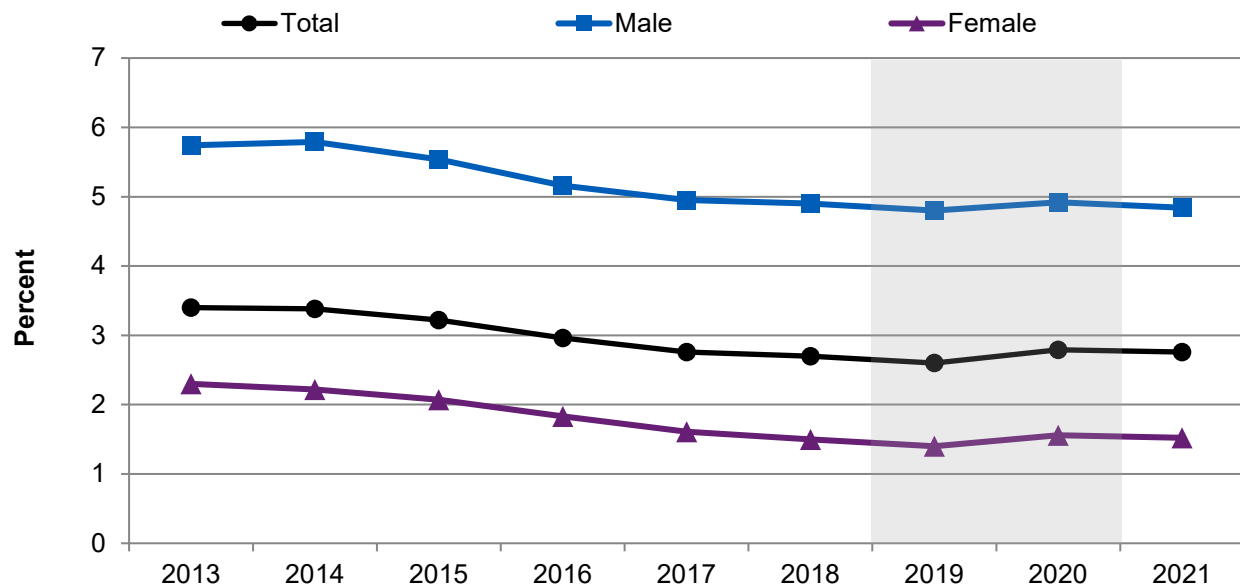
Source: Centers for Medicare & Medicaid Services, Skilled Nursing Facility Quality Reporting Program, Resident Assessment Files, Minimum Data Set 3.0, 2013-2021.
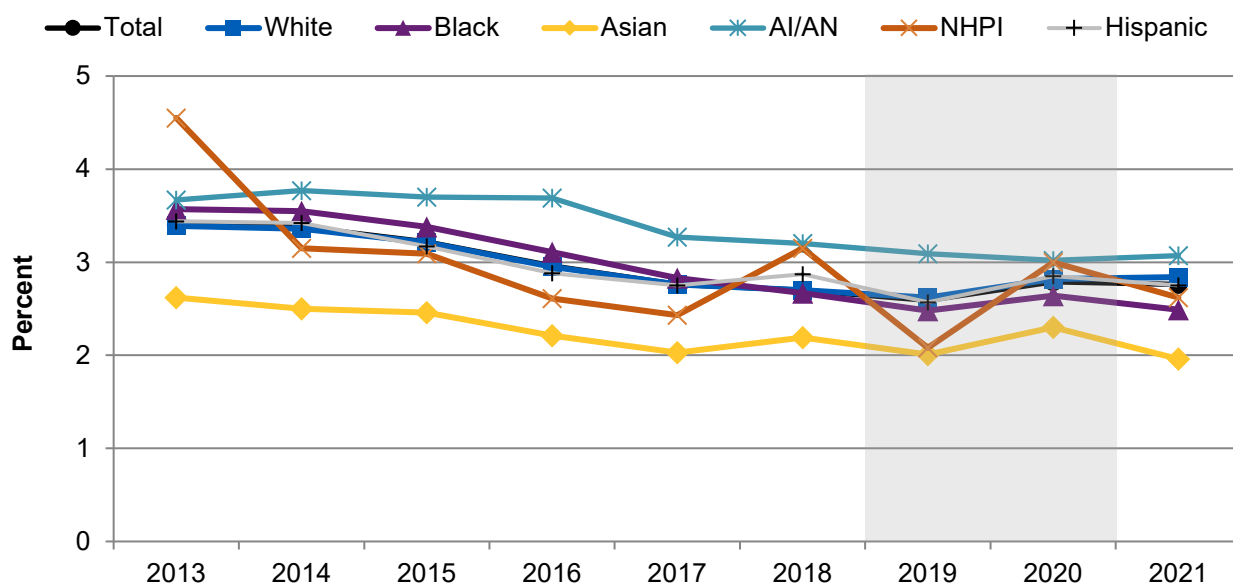**Denominator:** Medicare chronic care nursing home long-stay residents with a valid target assessment, excluding admission assessments or assessments with missing data.
Numerator: Subset of the denominator with indwelling catheters on target assessment.
Note: For this measure, lower percentages are better. Shaded area indicates data impacted by the COVID-19 public health emergency.

- **Importance:** Long-term catheter use can lead to UTIs. This safety issue provides the rationale for the quality indicator "catheter left in bladder" publicly reported by nursing homes via the CMS website (Simmons, et al., 2016). Infection prevention strategies include:

  - Minimizing catheter use in general and avoiding catheter use for incontinent residents;
  - Training staff in proper techniques for urinary catheter insertion;
  - Using a closed urinary drainage system;
  - Using external catheters instead of indwelling catheters when possible;
  - Documenting key information related to urinary catheter use; and
  - Providing stop orders or reminders to remove such catheters.

- **Trends:** Between 2013 and 2021, the percentage of low-risk, long-stay nursing home residents with a catheter inserted and left in the bladder showed no statistically significant improvement overall or for either sex.

- **Groups With Disparities, 2021:**

  - Female nursing home residents were less likely than male residents to have had a catheter inserted and left in the bladder (1.5% vs. 4.8%).

Nursing Home Safety Resources

AHRQ offers several resources to improve the quality and safety of care in nursing homes, including:

- On-Time Pressure Ulcer Prevention,
- CUSP Toolkit To Reduce CAUTI and Other HAIs In Long-Term Care Facilities,
- Nursing Home Antimicrobial Stewardship Guide,
- Understanding Omissions of Care in Nursing Homes, and
- Falls Management Program.

AHRQ also funded the AHRQ ECHO National Nursing Home COVID-19 Action Network. This Network worked with nursing homes nationally to implement quality and safety interventions to reduce the spread of COVID-19. Visit AHRQ.gov for more tools and resources for long-term and nursing home care.

Patient Safety in the Home Health Setting

Home health agencies provide services to patients who are homebound and need skilled nursing care or therapy. In 2020, about 3.1 million Medicare beneficiaries had a home health episode, and approximately 1.5 million individuals were employed in home health care (AHHQI, 2021). Reasons for seeking home health care include acute illness, long-term health conditions, permanent disability, and terminal illness (NAHCH, 2010). Improvements among home health patients can reflect the quality of care from home health agencies.

In this section, measures address:

- Home health care patients whose management of oral medications improved.
- Adults who reported a home health care provider asking to see all the prescription and over-the-counter medicines they were taking when they first started getting home health care.
- Adults who reported that home health care providers talked with them about the purpose for taking their new or changed prescription medicines in the last 2 months of care.
- Adults who reported that home health care providers talked with them about the side effects of medicines in the last 2 months of care.
- Adults who reported that home health care providers talked with them about when to take medicines in the last 2 months of care.

COVID-19 Impact on Data for Patient Safety in the Home Health Setting

Due to the COVID-19 public health emergency, CMS made optional and temporarily excepted providers from submission of the Outcome and Assessment Information Set (OASIS). Therefore, 2020 estimates are based on quarter 3 and quarter 4 data only. For more information on the impact of the COVID-19 public health emergency on data collection and analysis, view the CMS Extraordinary Circumstance Exceptions Policy.

Findings

Home Health Care Patients With Improved Management of Oral Medications, by Race/Ethnicity

Home health care patients whose management of oral medications improved, by race/ethnicity, 2013-2021
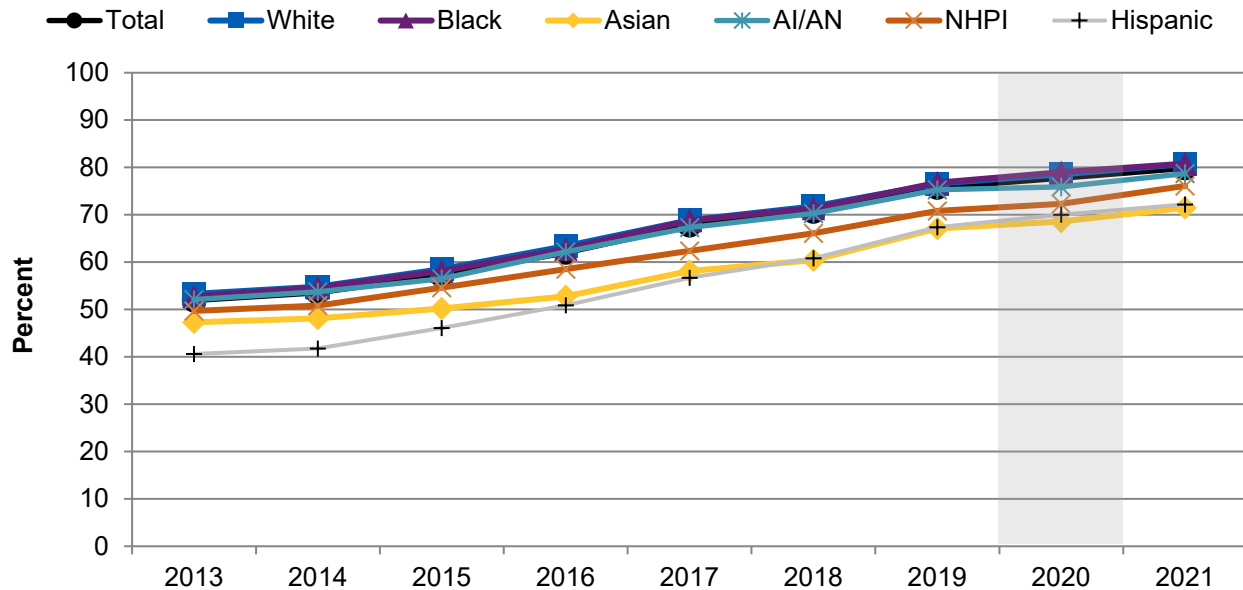
Key: AI/AN = American Indian or Alaska Native; NHPI = Native Hawaiian/Pacific Islander.
Source: Centers for Medicare & Medicaid Services, Home Health Quality Initiative, Chronic Conditions Data Warehouse, Outcome and Assessment Information Set, 2013-2021.
Denominator: Number of home health quality episodes ending with a discharge during the year, excluding episodes for which the patient, at start/resumption of care, was able to take oral medications correctly without assistance or supervision, episodes that end with inpatient facility transfer or death, or patient is nonresponsive, or patient has no oral medications prescribed.
Note: White, AI/AN, Asian, Black, and NHPI are non-Hispanic. Hispanic includes all races. Measure includes a subset of the denominator in which a person showed improvement in ability to manage oral medications compared with a prior assessment during an episode of care. Management is measured on a 4-level scale from 0 (fully independent) to 3 (entirely dependent) and refers to ability, not medication compliance. Further information about Home Health Quality Initiative measures is available at http://www.cms.hhs.gov/HomeHealthQualityInits/. Shaded area indicates data impacted by the COVID-19 public health emergency.

- **Importance:** Poor medication management may lead to incorrect, missed, and mistimed doses, reducing the effectiveness of medical treatment plans, making adverse events more likely, and potentially leading to hospitalization, injury, or death.
- **Overall Percentage:** In 2021, 79.8% of home health care patients taking oral medications had improved their medication management during an episode of care.
- **Trends:** From 2013 to 2021, medication management improved for patients overall and for all racial/ethnic groups.
- **Groups With Disparities, 2021:**

  - The percentage of home health care patients whose management of their oral medications improved was lower for Hispanic patients than for White patients (72.2% vs. 80.7%). Hispanic patients also fared worse than White patients in 2013, and there was no statistically significant change over time.

- The percentage of home health care patients whose management of their oral medications improved was lower for Asian patients than for White patients (71.5% vs. 80.7%). Asian patients also fared worse than White patients in 2013, and the disparity grew (worsened) from 2013 to 2021.
- The percentage of home health care patients whose management of their oral medications improved was lower for NHPI patients than for White patients (76.1% vs. 80.7%).
- The percentage of home health care patients whose management of their oral medications improved was lower for AI/AN patients than for White patients (78.7% vs. 80.7%).
- The percentage of home health care patients whose management of their oral medications improved was similar for Black patients and White patients (80.8 and 80.7%, respectively).

Home Health Care Patients With Improved Management of Oral Medications, by Age

Home health care patients whose management of oral medications improved, by age, 2013-2021
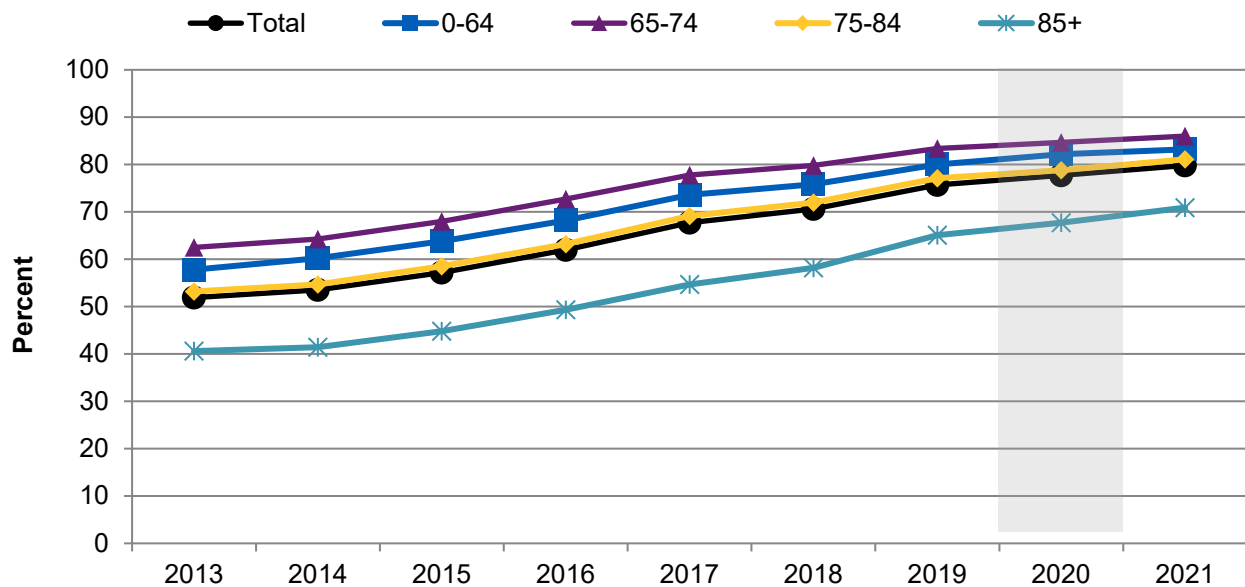
Source: Centers for Medicare & Medicaid Services, Home Health Quality Initiative, Chronic Conditions Data Warehouse, Outcome and Assessment Information Set, 2013-2021.
Denominator: All valid home health care episodes that begin in the survey year, excluding episodes for patients not taking oral medications, patients initially able to take oral medications correctly without assistance or supervision, nonresponsive patients, and patients with missing medication management data.
Note: Measure includes a subset of the denominator in which a person showed improvement in ability to manage oral medications compared with a prior assessment during an episode of care. Management is measured on a 4-level scale from 0 (fully independent) to 3 (entirely dependent) and refers to ability, not medication compliance. More information about Home Health Quality Reporting is available at https://www.cms.gov/medicare/quality/home-health. Shaded area indicates data impacted by the COVID-19 public health emergency.

- **Importance:** Poor medication management may lead to incorrect, missed, and mistimed doses, reducing the effectiveness of medical treatment plans, making adverse events more likely, and potentially leading to hospitalization, injury, or death.
- **Trends:** From 2013 to 2021, medication management improved for patients overall and for all age groups.

- **Groups With Disparities, 2021:**

  - The percentage of home health care patients whose management of their oral medications improved was higher for ages 65-74 than for all other age groups, including 0-64, 75-84, and 85 and over (86.0% vs. 83.2%, 81.1%, and 70.9%, respectively).

Home Health Providers Asking To See All Medications, by Race/Ethnicity

Adults who reported a home health provider asking to see all the prescription and over-the-counter medicines they were taking when they first started getting home health care, by race/ethnicity, 2012-2022
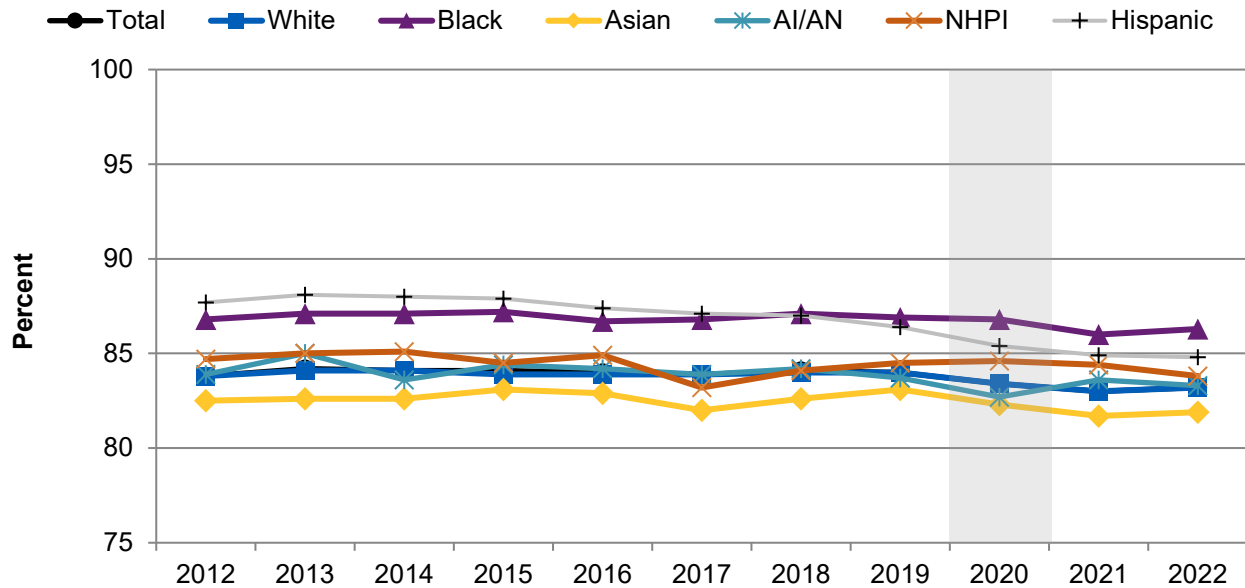
Key: AI/AN = American Indian or Alaska Native; NHPI = Native Hawaiian/Pacific Islander.
Source: Centers for Medicare & Medicaid Services, Home Health Consumer Assessment of Healthcare Providers and Systems, 2012-2022.
Denominator: Adult home health care patients age 18 and over who provided a valid response to the question, "When you first started getting home health care from this agency, did someone from the agency ask to see all the prescription and over-the-counter medicines you are taking?" excluding nonrespondents and respondents who "do not remember."
Note: White, AI/AN, Asian, Black, and NHPI are non-Hispanic. Hispanic includes all races. Shaded area indicates data impacted by the COVID-19 public health emergency.

- **Importance:**

  - Home health care providers asking to see all medications is a preliminary step in ensuring that patients take only medications appropriate to their condition and understand why, when, and how much of each medication to take. This step may be especially important in protecting against medication errors and adverse events after transitions from facility-based care to home care.
  - This measure focuses on patients' recollection of their experience with the home health agency. It is important to note that the skill sets and required training of home health care workers varies substantially across States. While home health care workers in some states may be trained to assist providers in medication reconciliation, workers in other states

may not. Medication reconciliation is a key part of ambulatory care. For more information, refer to the [Patient Safety Primer: Ambulatory Care Safety](#).

- **Overall Percentage:** In 2022, 83.2% of adult home health patients reported that they had been asked to show a home health care provider all the prescription and over-the-counter medicines they were taking when they first started getting home health care.
- **Trends:** From 2012 to 2022, there were no statistically significant changes in the percentage of home health patients reporting that they had been asked to show their medications to a home health care provider.
- **Groups With Disparities:**

  - Black and Hispanic home health patients were more likely than White patients to have been asked to show their medications to a home health care provider (86.3% and 84.8%, respectively, vs. 83.2%).

Home Health Care Providers Asking To See All Medications, by Age

Adults who reported a home health provider asking to see all the prescription and over-the-counter medicines they were taking, when they first started getting home health care, by age, 2012-2022

Source: Centers for Medicare & Medicaid Services, Home Health Consumer Assessment of Healthcare Providers and Systems, 2012-2022.
Denominator: Adult home health patients age 18 and over who provided a valid response to the question, "When you first started getting home health care from this agency, did someone from the agency ask to see all the prescription and over-the-counter medicines you are taking?" excluding nonrespondents and respondents who "do not remember."
Note: Shaded area indicates data impacted by the COVID-19 public health emergency.

- **Importance:**

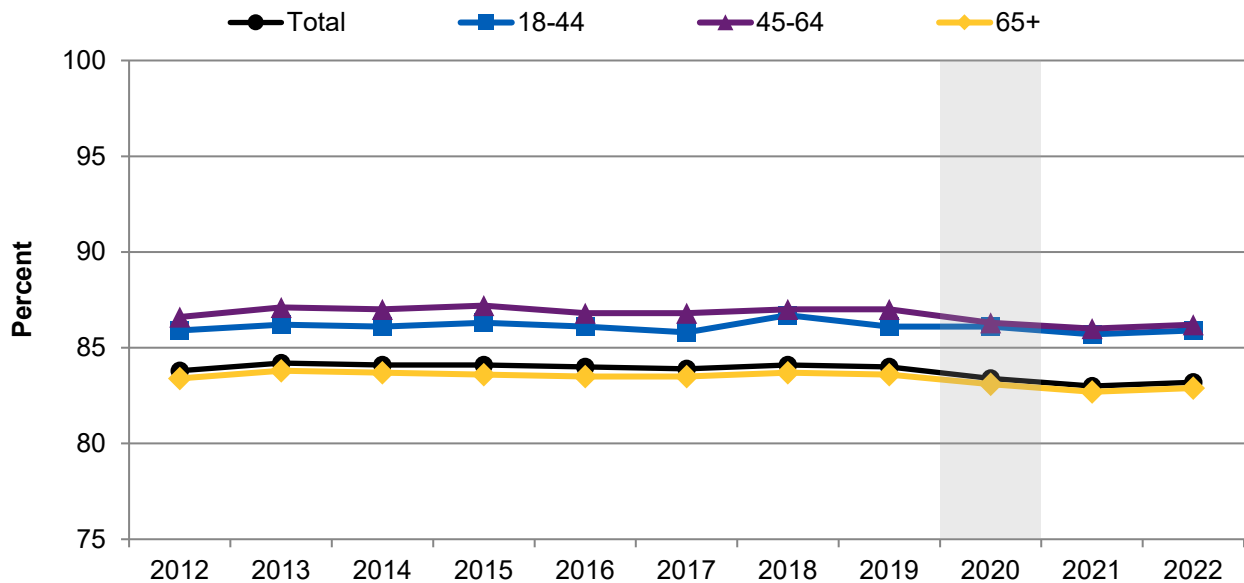 - Home health care providers asking to see all medications is a preliminary step in ensuring that patients take only medications appropriate to their condition and understand why, when, and how much of each medication to take. This step may be especially important in protecting against medication errors and adverse events after transitions from facility-based care to home care.
  - This measure focuses on patients' recollection of their experience with the home health agency. It is important to note that the skill sets and required training of home health care workers varies substantially across States. While home health care workers in some states may be trained to assist providers in medication reconciliation, workers in other states may not. Medication reconciliation is a key part of ambulatory care. For more information, refer to the Patient Safety Primer: Ambulatory Care Safety.

- **Groups With Disparities:**

  - Adults age 65 and over were less likely than adults ages 18-44 to have been asked to show their medications to a home health care provider (82.9% vs. 85.9%). This disparity existed in 2012 and has widened slightly over time.
  - The percentage of patients who were asked to show their medications to a home health care provider was similar for adults ages 18-44 and adults ages 45-64 (85.9% and 86.2%, respectively).

Home Health Providers Discussing Purpose of Taking New Medications, by Race/Ethnicity

Adults who reported that home health care providers talked with them about the purpose of taking their new or changed prescription medicines in the last 2 months of care, by race/ethnicity, 2012-2022

Key: AI/AN = American Indian or Alaska Native; NHPI = Native Hawaiian/Pacific Islander.
Source: Centers for Medicare & Medicaid Services, Home Health Consumer Assessment of Healthcare Providers and Systems, 2012-2022.

Denominator: Adult home health patients age 18 and over who provided a valid response to the question, "In the last 2 months of care, did home health providers from this agency talk with you about the purpose for taking your new or changed prescription medicines?" Nonrespondents and respondents indicating "did not take any new prescription medicines or change any medicines" were excluded.

Note: White, AI/AN, Asian, Black, and NHPI are non-Hispanic. Hispanic includes all races. Shaded area indicates data impacted by the COVID-19 public health emergency.

- **Overall Percentage:** In 2022, 29.6% of adult home health patients reported that they had a home health care provider discuss the purpose of taking their prescription medicines in the last 2 months of care.
- **Trends:** From 2012 to 2022, the percentage of home health patients reporting that they had a home health care provider discuss the purpose of taking their prescription medicines in the last 2 months of care worsened.
- **Groups With Disparities, 2022:**

  - AI/AN home health patients were more likely than White, Black, Asian, and Hispanic patients to have a home health care provider talk with them about the purpose of taking their prescription medicines (31.6% vs. 30.1%, 27.8%, 27.0%, and 27.2%, respectively).

Home Health Providers Discussing Purpose of Taking New Medications, by Age

Adults who reported that home health care providers talked with them about the purpose of taking their new or changed prescription medicines in the last 2 months of care, by age, 2012-2022

Source: Centers for Medicare & Medicaid Services, Home Health Consumer Assessment of Healthcare Providers and Systems, 2012-2022.

Denominator: Adult home health patients age 18 and over who provided a valid response to the question, "In the last 2 months of care, did home health providers from this agency talk with you about the purpose for taking your new or changed prescription medicines?" Nonrespondents and respondents indicating "did not take any new prescription medicines or change any medicines" were excluded.

Note: Shaded area indicates data impacted by the COVID-19 public health emergency.

- **Groups With Disparities, 2022:**

  - Adults age 65 and over were less likely than adults ages 45-64 to have a home health care provider discuss the purpose of taking their prescription medicines in the last 2 months of care (29.1% vs. 34.1%). This disparity existed in 2012 and has narrowed over time.
  - Adults ages 18-44 were less likely than adults ages 45-64 to have a home health care provider discuss the purpose of taking their prescription medicines in the last 2 months of care (30.7% vs. 34.1%).

Home Health Providers Discussing Side Effects of Medications, by Race/Ethnicity

Adults who reported that home health care providers talked with them about the side effects of medicines in the last 2 months of care, by race/ethnicity, 2012-2022

Key: AI/AN = American Indian or Alaska Native; NHPI = Native Hawaiian/Pacific Islander.
Source: Centers for Medicare & Medicaid Services, Home Health Consumer Assessment of Healthcare Providers and Systems, 2012-2022.
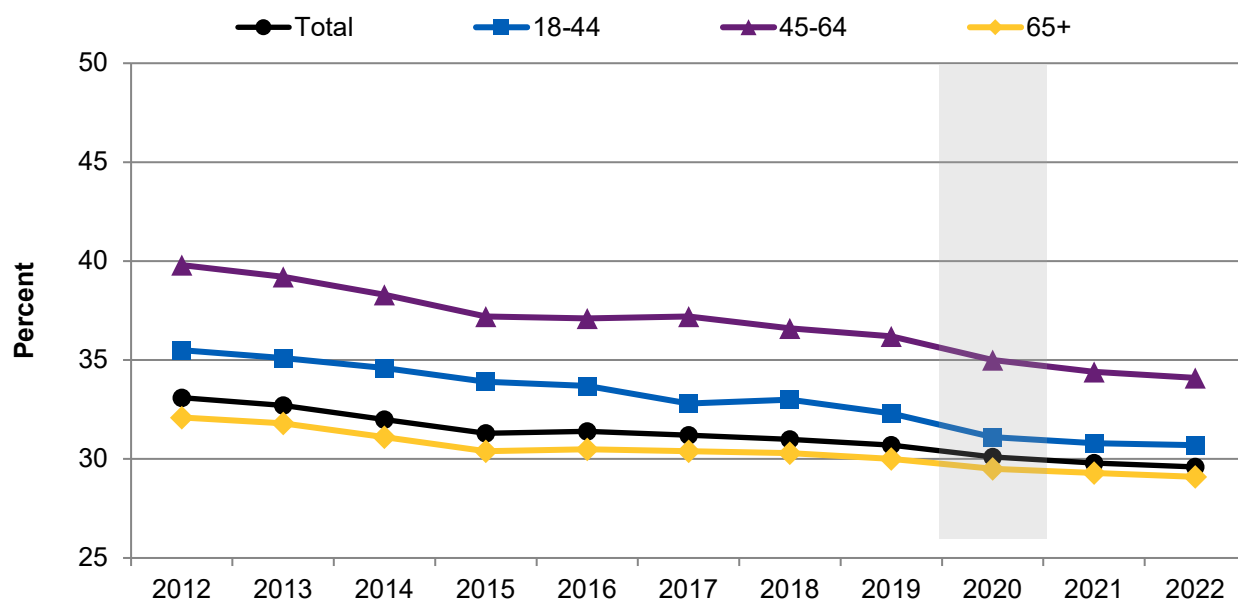**Denominator:** Adult home health patients age 18 and over who provided a valid response to the question, "In the last 2 months of care, did home health providers from this agency talk with you about the side effects of these medicines?" Nonrespondents and respondents indicating "did not take any new prescription medicines or change any medicines" were excluded.
Note: White, AI/AN, Asian, Black, and NHPI are non-Hispanic. Hispanic includes all races. Shaded area indicates data impacted by the COVID-19 public health emergency.

- **Overall Percentage:** In 2022, 22.3% of adult home health patients reported that they had a home health care provider discuss the side effects of medicines in the last 2 months of care.
- **Trends:** From 2012 to 2022, the percentage of home health patients reporting that they had a home health care provider discuss the side effects of medicines in the last 2 months of care decreased.

- **Groups With Disparities, 2022:**

  - AI/AN home health patients were more likely than White, Black, Asian, and Hispanic patients to have a home health care provider talk with them about the side effects of medicines (24.7% vs. 22.6%, 21.3%, 21.7%, and 22.1%, respectively).
  - The percentage of home health care patients to have a home health care provider talk with them about the side effects of medicines was similar for AI/AN and NHPI home health patients (24.7% and 24.6%, respectively).

Home Health Providers Discussing Side Effects of Medications, by Age

Adults who reported that home health care providers talked with them about the side effects of medicines in the last 2 months of care, by age, 2012-2022

Source: Centers for Medicare & Medicaid Services, Home Health Consumer Assessment of Healthcare Providers and Systems, 2012-2022.

Denominator: Adult home health patients age 18 and over who provided a valid response to the question, "In the last 2 months of care, did home health providers from this agency talk with you about the side effects of these medicines?" Nonrespondents and respondents indicating "did not take any new prescription medicines or change any medicines" were excluded.
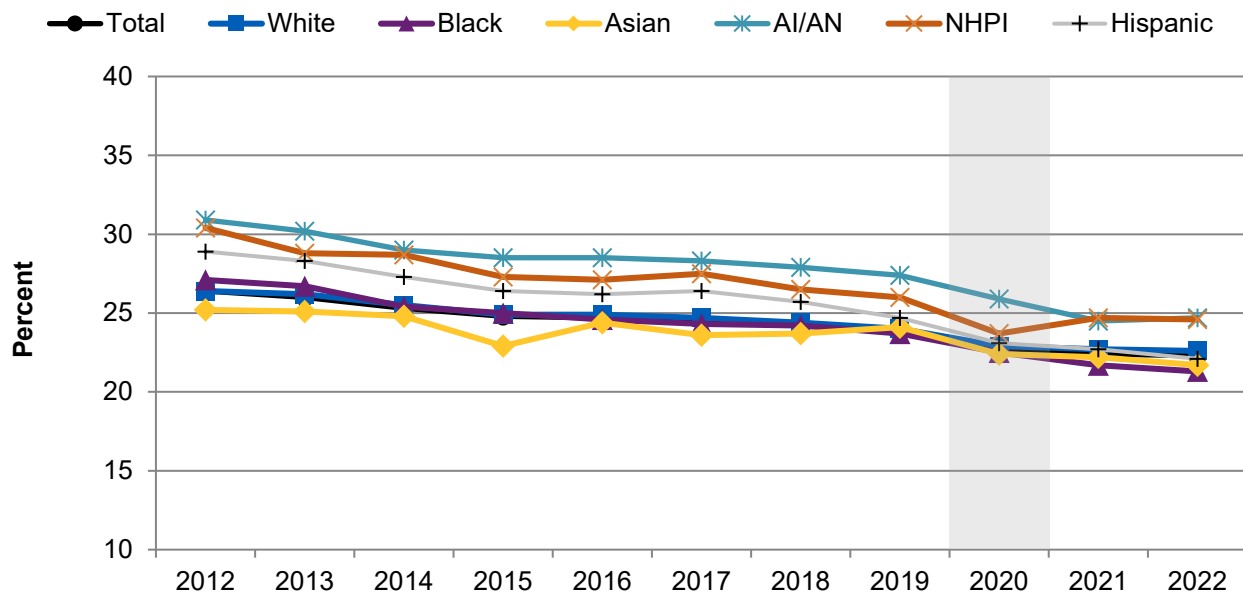
Note: Shaded area indicates data impacted by the COVID-19 public health emergency.

- **Groups With Disparities, 2022:**

  - Adults age 65 and over were less likely than adults ages 45-64 to have a home health care provider discuss the side effects of medicines in the last 2 months of care (21.8% vs. 26.9%). This disparity existed in 2012 and has narrowed over time.
  - Adults ages 18-44 were less likely than adults ages 45-64 to have a home health care provider discuss the side effects of medicines in the last 2 months of care (24.2% vs. 26.9%).

Home Health Providers Discussing When To Take Medications, by Race/Ethnicity

Adults who reported that home health care providers talked with them about when to take medicines in the last 2 months of care, by race/ethnicity, 2012-2022

Key: AI/AN = American Indian or Alaska Native; NHPI = Native Hawaiian/Pacific Islander.
Source: Centers for Medicare & Medicaid Services, Home Health Consumer Assessment of Healthcare Providers and Systems, 2012-2022.
Denominator: Adult home health patients age 18 and over who provided a valid response to the question, "In the last 2 months of care, did home health providers from this agency talk with you about when to take these medicines?" Nonrespondents and respondents indicating "did not take any new prescription medicines or change any medicines" were excluded.
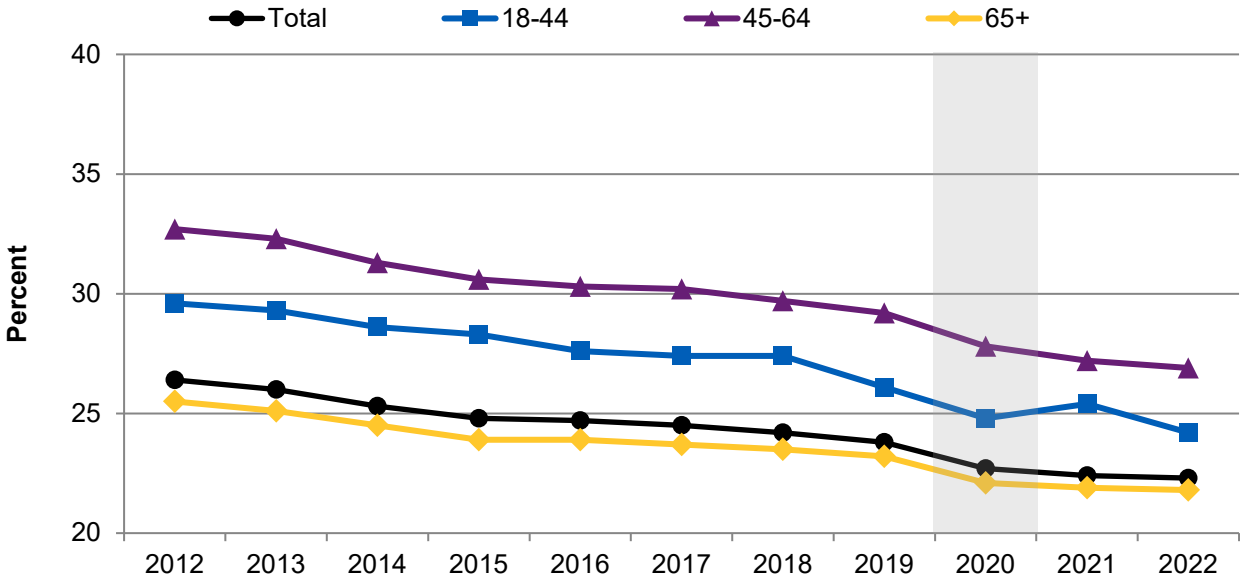**Note:** White, AI/AN, Asian, Black, and NHPI are non-Hispanic. Hispanic includes all races. Shaded area indicates data impacted by the COVID-19 public health emergency.

- **Overall Percentage:** In 2022, 26.4% of adult home health patients reported that they had a home health care provider discuss when to take medicines in the last 2 months of care.
- **Trends:** From 2012 to 2022, the percentage of home health patients reporting that they had a home health care provider discuss when to take medicines in the last 2 months of care decreased.
- **Groups With Disparities, 2022:**

  - AI/AN home health patients were more likely than White, Black, Asian, and Hispanic patients to have a home health care provider talk with them about when to take medicines (29.9% vs. 26.7%, 26.0%, 25.1%, and 25.9%, respectively).
  - The percentage of home health patients to have a home health care provider talk with them about when to take medicines in the last 2 months of care was similar for AI/AN and NHPI patients (29.9% and 29.1%, respectively).

Home Health Providers Discussing When To Take Medications, by Age

Adults who reported that home health care providers talked with them about when to take medicines in the last 2 months of care, by age, 2012-2022

Source: Centers for Medicare & Medicaid Services, Home Health Consumer Assessment of Healthcare Providers and Systems, 2012-2022.

Denominator: Adult home health patients age 18 and over who provided a valid response to the question, "In the last 2 months of care, did home health providers from this agency talk with you about when to take these medicines?" Nonrespondents and respondents indicating "did not take any new prescription medicines or change any medicines" were excluded.
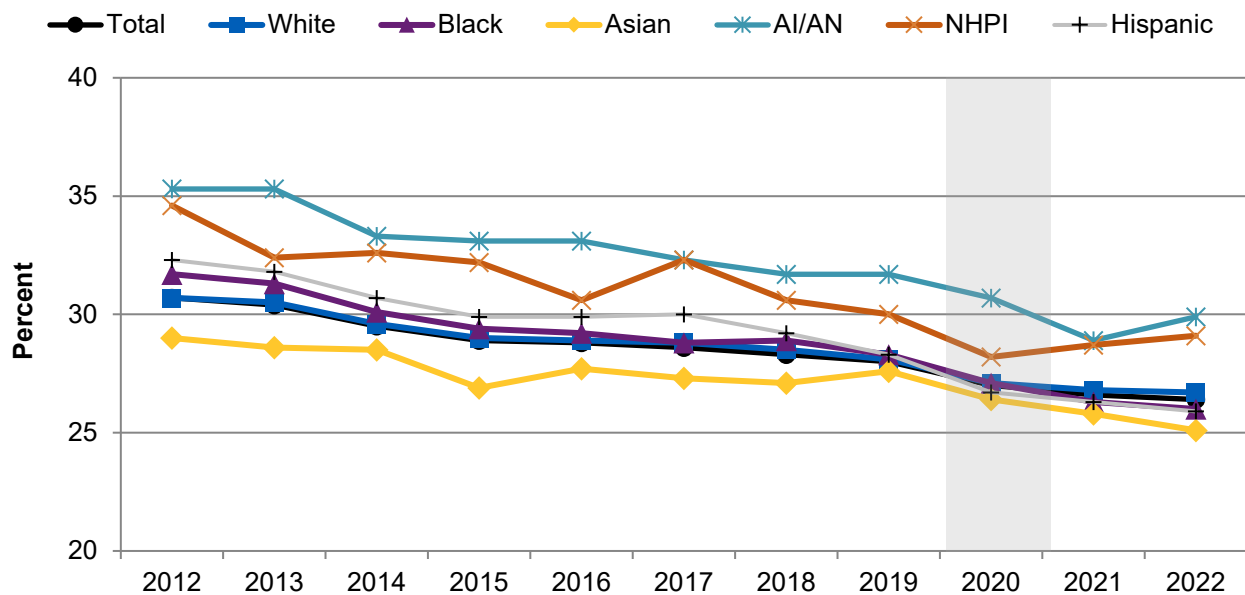
Note: Shaded area indicates data impacted by the COVID-19 public health emergency.

- **Groups With Disparities, 2022:**

  - Adults age 65 and over were less likely than adults ages 45-64 to have a home health care provider discuss when to take their prescription medicines in the last 2 months of care (25.9% vs. 31.4%). This disparity existed in 2012 and has narrowed over time.
  - Adults ages 18-44 were less likely than adults ages 45-64 to have a home health care provider discuss when to take their prescription medicines in the last 2 months of care (28.5% vs. 31.4%).

Home Health Care Quality and Safety Resources

Home health care quality and safety resources continue to evolve:

- AHRQ currently offers the CAHPS Home Health Care Survey that asks patients to assess the quality of their home health care experience.
- In 2011, AHRQ and the National Academies of Sciences co-published Bringing Human Factors Into Home Health Care, a report examining the impact of health information technology on home health care delivery.

In addition, AHRQ published a blog post in 2022, "Challenges and Opportunities in Home Health Quality Improvement."

Patient Safety, Health Literacy, and Communication

Patient safety and person-centered care are directly related quality domains. Poor communication is a leading cause of patient safety events and poor patient experiences of care (Kohn, et al., 2000; Divi, et al., 2007; Khan, et al., 2020):

- Poor communication can occur between patients and providers, as well as between providers. It prevents health equity, the equal opportunity of health, from being properly achieved. For more information on health equity and efforts to eliminate disparities in healthcare, visit https://www.cdc.gov/healthequity/whatis/index.html.
- Poor communication can continue to harm patients and families after an adverse event has occurred (Etchegaray, et al., 2014).

Studies show that some adult hospital patients experience poorer communication with their providers based on their race, ethnicity, or educational status (Elliott, et al., 2016; Zhu, et al., 2015; Karter, et al, 2007). Communication gaps occur in all settings of care and are barriers to health equity.

Health Literacy

Healthy People 2030 has two complementary definitions (ODPHP, 2020) that together constitute health literacy:

- Personal Health Literacy: The degree to which individuals have the ability to find, understand, and use information and services to inform health-related decisions and actions for themselves and others.
- Organizational Health Literacy: The degree to which organizations equitably enable individuals to find, understand, and use information and services to inform health-related decisions and actions for themselves and others.

Health-literate communication is improving but is far from universal (Liang & Brach, 2017). Many evidence-based health literacy strategies, such as the teach-back method (Schillinger, et al., 2003), can help healthcare organizations be health literate (Koh, et al., 2013).

Even people with adequate personal health literacy can have trouble understanding what to do to attain and maintain good health. Many patients leave their healthcare visit unsure of what their provider asked them to do or what was discussed.

More information on health literacy is available in the Patient Safety Primer: Strategies To Improve Organizational Health Literacy and the Patient Safety Primer: Personal Health Literacy.

Measures of communication in this section are:

- Adults who had a doctor's office or clinic visit in the last 12 months whose health providers sometimes or never explained things in a way they could understand.
- Adults who had a doctor's office or clinic visit in the last 12 months whose health providers always asked them to describe how they would follow the instructions.

- Adults who had a doctor's office or clinic visit in the last 12 months whose health providers always gave them easy-to-understand instructions about what to do for a specific illness or health condition.
- Adults who reported that home health providers always explained things in a way that was easy to understand in the last 2 months of care.

These measures fall under the person-centered care quality domain within the NHQDR database. They are not included in the summary bar charts shown earlier. These measures are represented in the person-centered care bar shown earlier.

COVID-19 Impact on Data for Patient Safety, Health Literacy, and Communication

Due to the COVID-19 public health emergency, CMS made optional and temporarily excepted providers from submission of the Home Health Care Consumer Assessment of Healthcare Providers and Systems. This exception applies to Assessment Data for quarter 4 of 2019 and quarters 1 and 2 of 2020. For more information on the impact of the COVID-19 public health emergency on data collection and analysis, view the CMS Extraordinary Circumstance Exceptions Policy.

Findings

Poor Communication Between Doctors and Patients, by Race/Ethnicity

Adults who had a doctor's office or clinic visit in the last 12 months whose health providers sometimes or never explained things in a way they could understand, 2002-2019
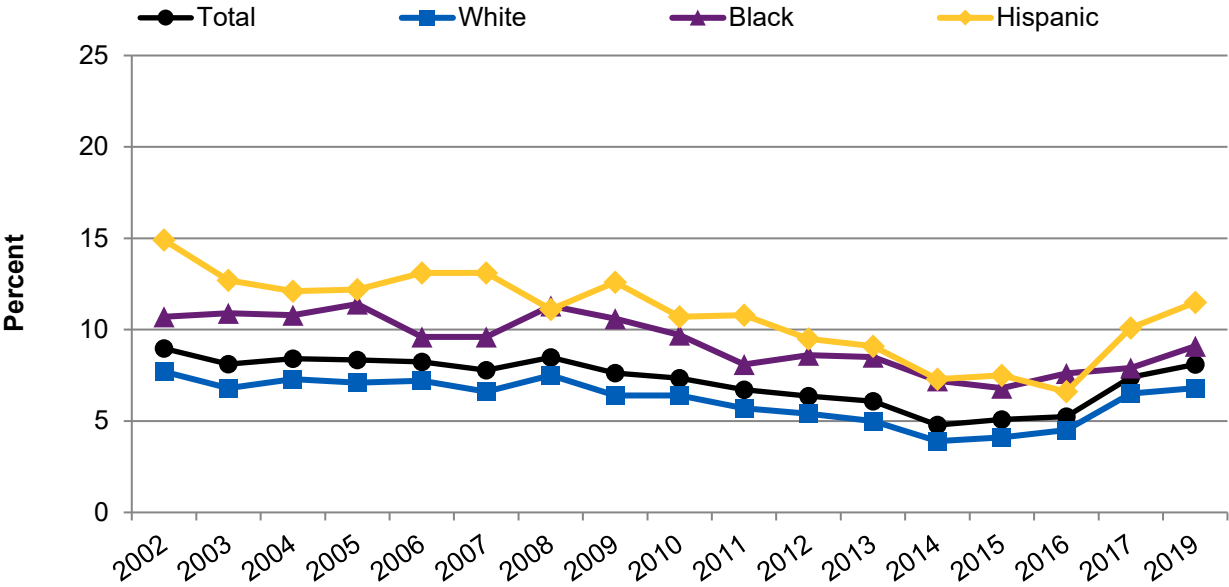
Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2002-2019.
Denominator: Adults who had a doctor's office or clinic visit in the last 12 months, excluding missing data; the possible answer categories were Never, Sometimes, Usually, Always.
Note: For this measure, lower percentages are better. White and Black are non-Hispanic. Hispanic includes all races. Data were unavailable for 2018.

- **Importance:** When healthcare providers use teach-back with their patients, they ask them to describe in their own words what they heard. If patients cannot teach the information back correctly, providers have to instruct them again using a different way of explaining, until patients can correctly teach back what they learned (AHRQ, 2019b). The use of strategies such as teach-back and shared decision making are contributing to improvements in patient-provider communication. Breakdowns in communication still exist and require close examination of modes of communication, implicit bias, and trust building (Boulware, et al., 2003).
- **Overall Percentage:** In 2019, 8.1% of adults who had a doctor's office or clinic visit in the last 12 months had health providers who sometimes or never explained things in a way they could understand.
- **Trends:** The percentage of adults who had a doctor's office or clinic visit in the last 12 months whose health providers sometimes or never explained things in a way they could understand improved from 2002 to 2019 for all racial/ethnic groups.
- **Groups With Disparities, 2019:**

  - Hispanic adults were more likely than White adults to have a doctor's office or clinic visit in the last 12 months where health providers sometimes or never explained things in a way they could understand (11.5% vs. 6.8%).
  - Black adults were more likely than White adults to have a doctor's office or clinic visit in the last 12 months where health providers sometimes or never explained things in a way they could understand (9.1% vs. 6.8%).

Poor Communication Between Doctors and Patients, by Age

Adults who had a doctor's office or clinic visit in the last 12 months whose health providers sometimes or never explained things in a way they could understand, by age, 2002-2019

Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2002-2019.
Denominator: Adults who had a doctor's office or clinic visit in the last 12 months, excluding missing data; the possible answer categories were Never, Sometimes, Usually, Always.
Note: For this measure, lower percentages are better. Data were unavailable for 2018.

- **Importance:** When healthcare providers use teach-back with their patients, they ask them to describe in their own words what they heard. If patients cannot teach the information back correctly, providers have to instruct them again using a different way of explaining, until patients can correctly teach back what they learned (AHRQ, 2019b). The use of strategies such as teach-back and shared decision making are contributing to improvements in patient-provider communication. Breakdowns in communication still exist and require close examination of modes of communication, implicit bias, and trust building (Boulware, et al., 2003).
- **Trends:** The percentage of adults ages 18-44 years who had a doctor's office or clinic visit in the last 12 months where health providers sometimes or never explained things in a way they could understand improved from 2002 (10.3%) to 2019 (8.6%). All other age groups had no statistically significant changes over time.
- **Groups With Disparities, 2019:**

  - The percentages of adults ages who had a doctor's office or clinic visit in the last 12 months where health providers sometimes or never explained things in a way they could understand was higher for adults ages 18-44 compared with adults age 65 and over (8.6% vs. 7.1%).

Poor Communication Between Doctors and Patients, by Income

Adults who had a doctor's office or clinic visit in the last 12 months whose health providers sometimes or never explained things in a way they could understand, by income, 2002-2019
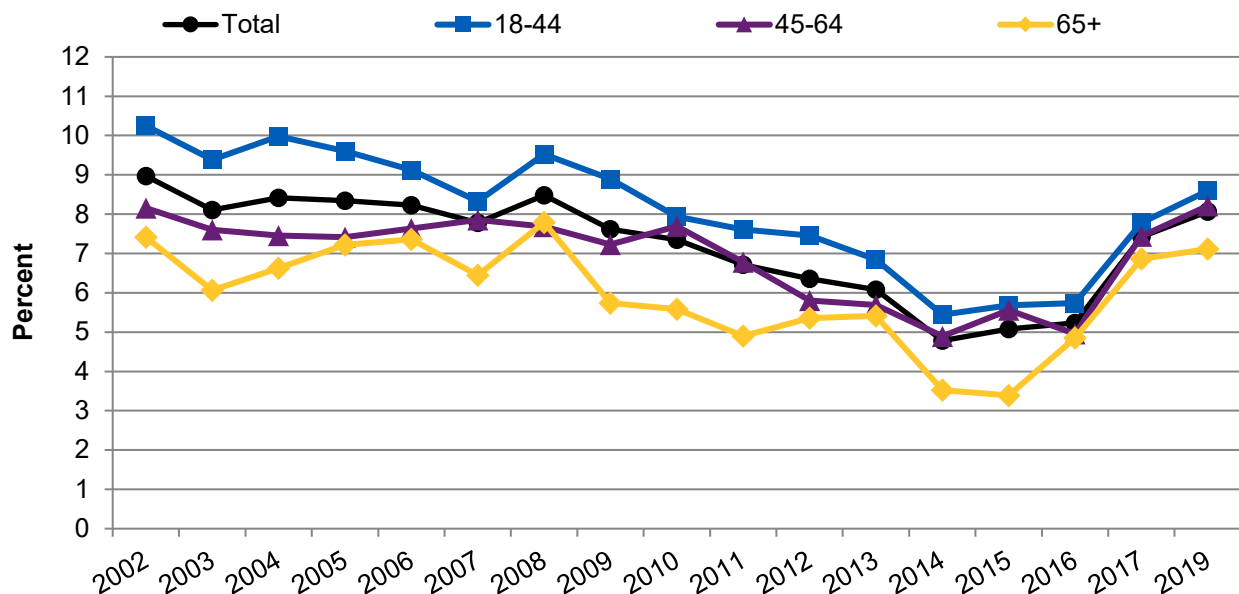

Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2002-2019.
Denominator: Adults who had a doctor's office or clinic visit in the last 12 months, excluding missing data; the possible answer categories were Never, Sometimes, Usually, Always.
Note: For this measure, lower percentages are better. Data were unavailable for 2018. PG refers to the federal poverty guideline.

- **Importance:** When healthcare providers use teach-back with their patients, they ask them to describe in their own words what they heard. If patients cannot teach the information back correctly, providers have to instruct them again using a different way of explaining, until

patients can correctly teach back what they learned (AHRQ, 2019b). The use of strategies such as teach-back and shared decision making are contributing to improvements in patient-provider communication. Breakdowns in communication still exist and require close examination of modes of communication, implicit bias, and trust building (Boulware, et al., 2003).

- **Trends:** The percentage of adults who had a doctor's office or clinic visit in the last 12 months where health providers sometimes or never explained things in a way they could understand showed no statistically significant changes over time for all income categories.

- **Groups With Disparities, 2019:**

  - The percentage of adults who had a doctor's office or clinic visit in the last 12 months where health providers sometimes or never explained things in a way they could understand was higher for adults with an income less than 100% of PG compared with adults with an income 400% of PG or more (12.4% vs. 6.3%).
  - The percentage of adults who had a doctor's office or clinic visit in the last 12 months where health providers sometimes or never explained things in a way they could understand was higher for adults with an income 100-199% of PG compared with adults with an income 400% of PG or more (11.1% vs. 6.3%).
  - The percentage of adults who had a doctor's office or clinic visit in the last 12 months where health providers sometimes or never explained things in a way they could understand was higher for adults with an income 200-399% of PG compared with adults with an income 400% of PG or more (8.1% vs. 6.3%).

Poor Communication Between Doctors and Patients, by Insurance

Adults ages 18-64 who had a doctor's office or clinic visit in the last 12 months whose health providers sometimes or never explained things in a way they could understand, by insurance, 2002-2019

Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2002-2019.
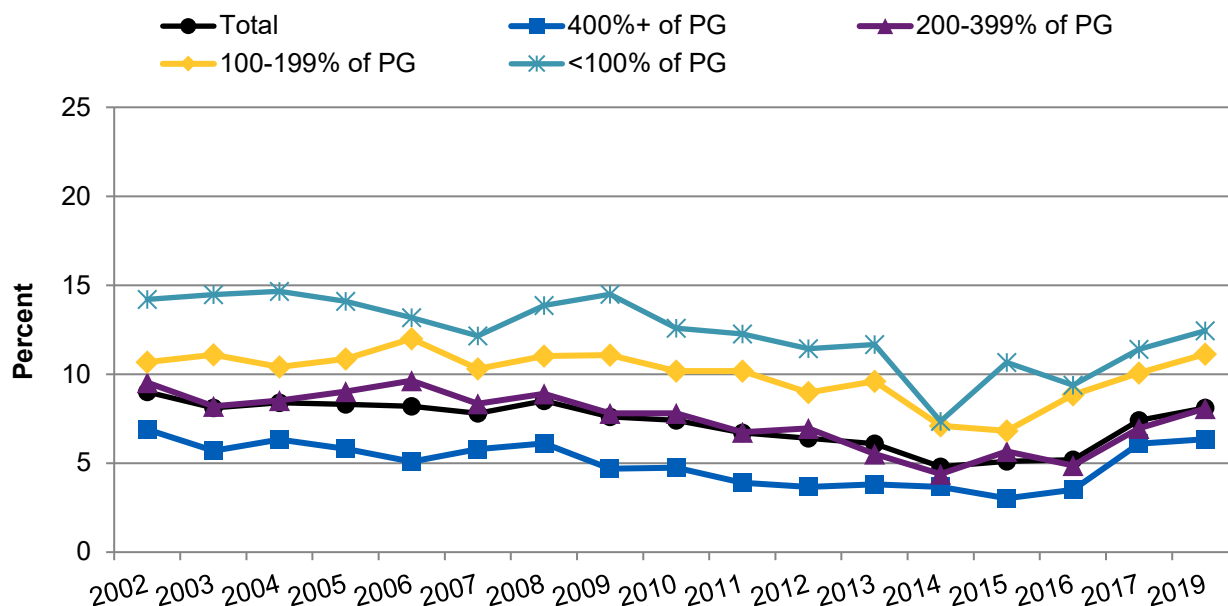**Denominator:** Adults who had a doctor's office or clinic visit in the last 12 months, excluding missing data; the possible answer categories were Never, Sometimes, Usually, Always.
Note: For this measure, lower percentages are better. Data were unavailable for 2018.
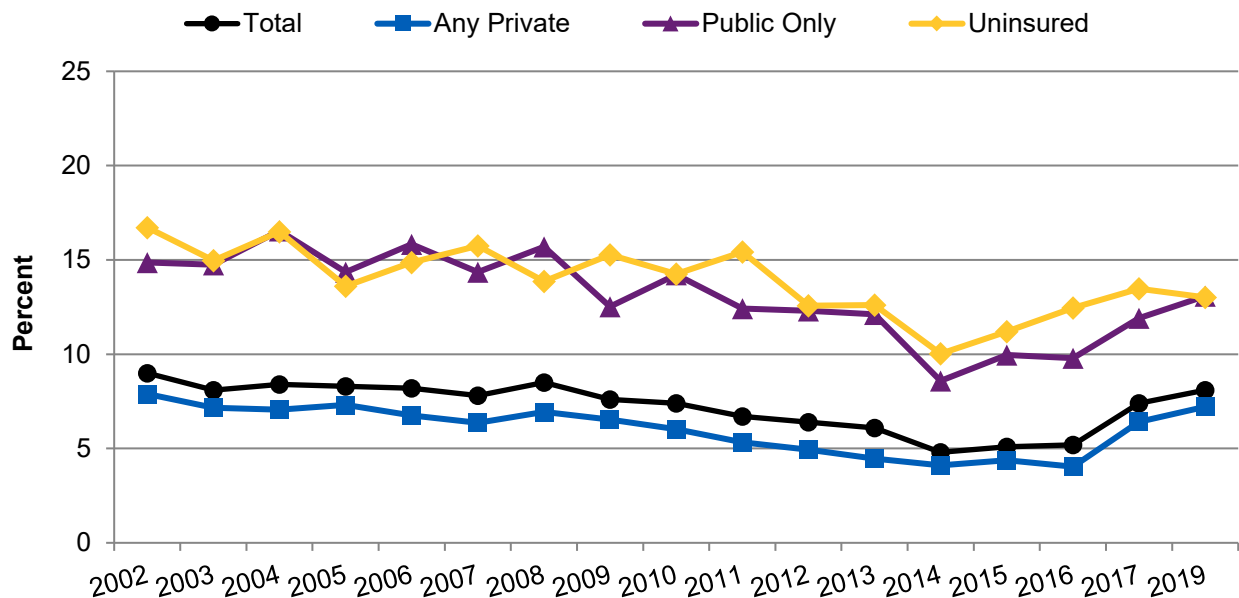
- **Importance:** When healthcare providers use teach-back with their patients, they ask them to describe in their own words what they heard. If patients cannot teach the information back correctly, providers have to instruct them again using a different way of explaining, until patients can correctly teach back what they learned (AHRQ, 2019b). The use of strategies such as teach-back and shared decision making are contributing to improvements in patient-provider communication. Breakdowns in communication still exist and require close examination of modes of communication, implicit bias, and trust building (Boulware, et al., 2003).
- **Trends:** From 2002 to 2019, there were no statistically significant changes for any insurance category in the percentage of adults who had a doctor's office or clinic visit in the last 12 months where health providers sometimes or never explained things in a way they could understand.
- **Groups With Disparities, 2019:**

  - The percentage of adults who had a doctor's office or clinic visit in the last 12 months where health providers sometimes or never explained things in a way they could understand was higher among adults with public insurance and uninsured adults compared with adults with any private insurance (13.1% and 13.0%, respectively, vs. 7.2%).

Use of Teach-Back, by Race/Ethnicity

Adults who had a doctor's office or clinic visit in the last 12 months whose health providers always asked them to describe how they would follow the instructions, by race/ethnicity, 2011-2019

Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2011-2019.
Note: White, Black, and Asian are non-Hispanic. Hispanic includes all races. Data were unavailable for 2018.

- **Importance:** Many patients leave their healthcare visit unsure of what their provider asked them to do or what was discussed. Nationwide, only 12% of adults have proficient health literacy (Kutner, et al., 2006). That means almost 9 out of 10 Americans find it challenging "to obtain, process, and understand basic health information and services needed to make appropriate health decisions" (IOM, 2004). The use of strategies such as teach-back and shared decision making are contributing to improvements in patient-provider communication.

Breakdowns in communication still exist and require close examination of modes of communication, implicit bias, and trust building (Boulware, et al., 2003).

- **Overall Percentage:** From 2011 to 2019, the percentage of adults who had a doctor's office or clinic visit in the last 12 months whose health providers always asked them to describe how they would follow the instructions increased from 24.4% to 25.6% but the change was not statistically significant.

- **Groups With Disparities, 2019:**

  - Hispanic and Black adults who had a doctor's office or clinic visit in the last 12 months were more likely than White adults to have their health providers always ask them to describe how they would follow the instructions (36.2% and 37.5%, respectively, vs. 21.9%).

Use of Teach-Back, by Age

Adults who had a doctor's office or clinic visit in the last 12 months whose health providers always asked them to describe how they would follow the instructions, by age, 2011-2019

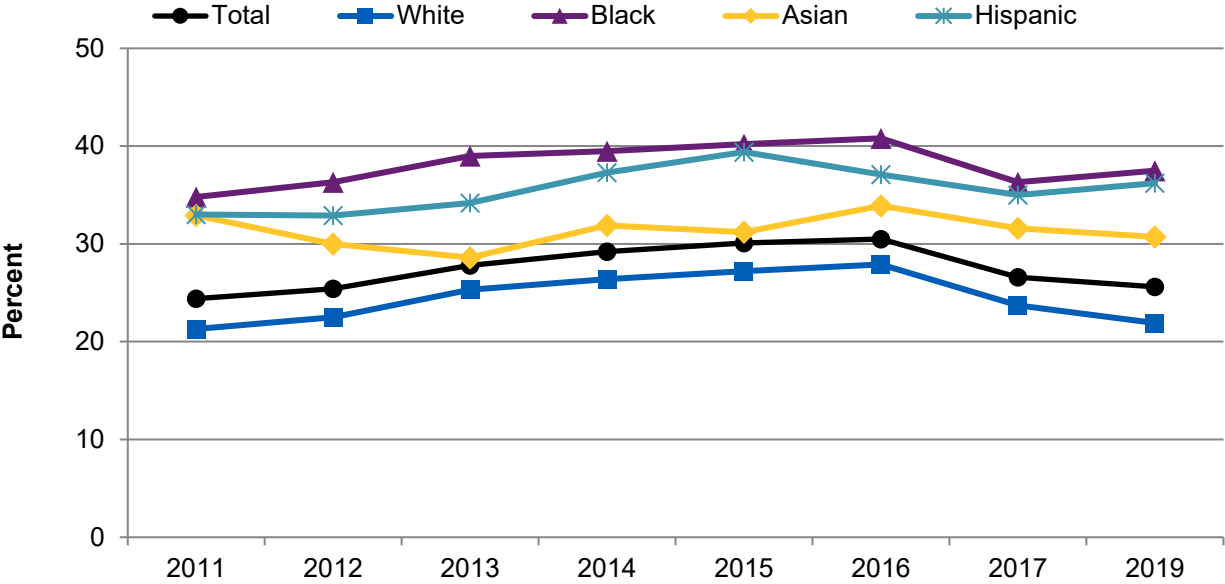**Source:** Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2011-2019.
Note: Data were unavailable for 2018.

- **Importance:** Many patients leave their healthcare visit unsure of what their provider asked them to do or what was discussed. Nationwide, only 12% of adults have proficient health literacy (Kutner, et al., 2006). That means almost 9 out of 10 Americans find it challenging "to obtain, process, and understand basic health information and services needed to make appropriate health decisions" (IOM, 2004). The use of strategies such as teach-back and shared decision making are contributing to improvements in patient-provider communication. Breakdowns in communication still exist and require close examination of modes of communication, implicit bias, and trust building (Boulware, et al., 2003).

- **Trends:** The percentage of adults ages 18-44 years who had a doctor's office or clinic visit in the last 12 months whose health providers always asked them to describe how they would follow the instructions improved from 2011 (23.0%) to 2019 (25.8%). All other age groups had no statistically significant changes over time.
- **Groups With Disparities, 2019:**

  - The percentages of adults ages 18-44, 45-64, and 65 and over who had a doctor's office or clinic visit in the last 12 months whose health providers always asked them to describe how they would follow the instructions were all similar (25.8%, 25.6%, and 25.5%, respectively).

Use of Teach-Back, by Income

Adults who had a doctor's office or clinic visit in the last 12 months whose health providers always asked them to describe how they would follow the instructions, by income, 2011-2019

Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2011-2019.
Note: PG refers to the federal poverty guideline.

- **Importance:** Many patients leave their healthcare visit unsure of what their provider asked them to do or what was discussed. Nationwide, only 12% of adults have proficient health literacy (Kutner, et al., 2006). That means almost 9 out of 10 Americans find it challenging "to obtain, process, and understand basic health information and services needed to make appropriate health decisions" (IOM, 2004). The use of strategies such as teach-back and shared decision making are contributin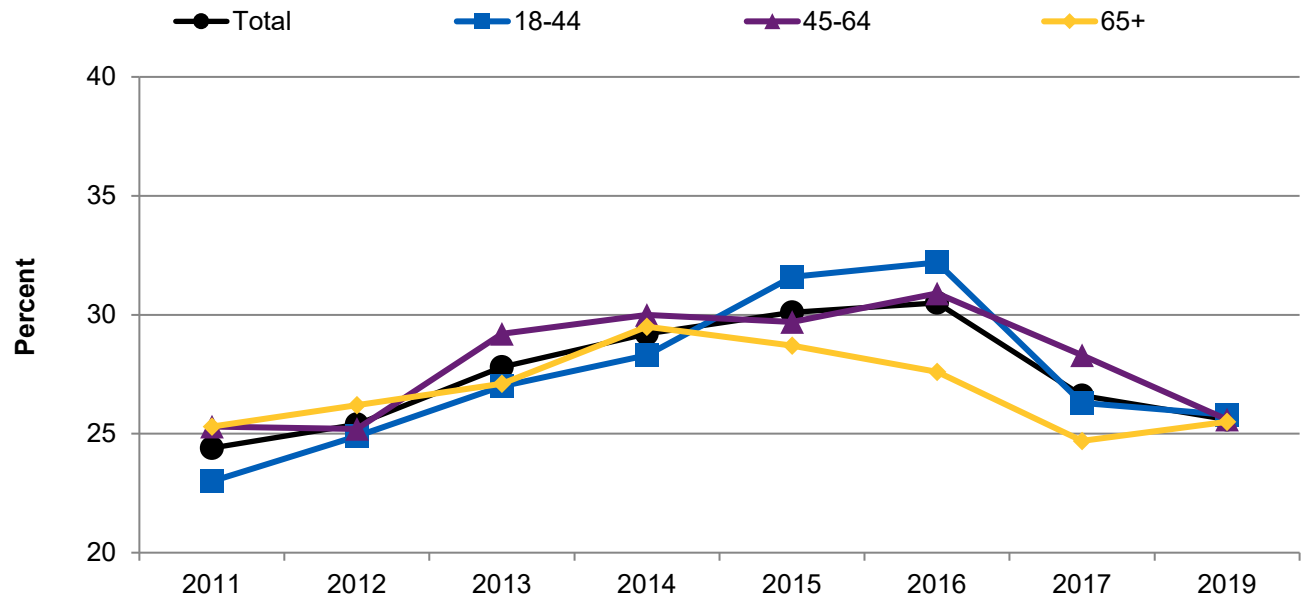g to improvements in patient-provider communication. Breakdowns in communication still exist and require close examination of modes of communication, implicit bias, and trust building (Boulware, et al., 2003).
- **Trends:** The percentage of adults who had a doctor's office or clinic visit in the last 12 months whose health providers always asked them to describe how they would follow the instructions showed no statistically significant changes over time for all income categories.

- **Groups With Disparities, 2019:**

  - The percentage of adults who had a doctor's office or clinic visit in the last 12 months and had health providers always ask them to describe how they would follow the instructions was higher for adults with an income less than 100% of PG compared with adults with an income 400% of PG or more or more (31.1% vs. 23.1%).
  - The percentage of adults who had a doctor's office or clinic visit in the last 12 months and had health providers always ask them to describe how they would follow the instructions was higher for adults with an income 100-199% of PG compared with adults with an income 400% of PG or more (30.5% vs. 23.1%).
  - The percentage of adults who had a doctor's office or clinic visit in the last 12 months and had health providers always ask them to describe how they would follow the instructions was higher for adults with an income 200-399% of PG compared with adults with an income 400% of PG or more (26.0% vs. 23.1%).

Use of Teach-Back, by Insurance

Adults who had a doctor's office or clinic visit in the last 12 months whose health providers always asked them to describe how they would follow the instructions, by insurance, 2011-2019

Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2011-2019.
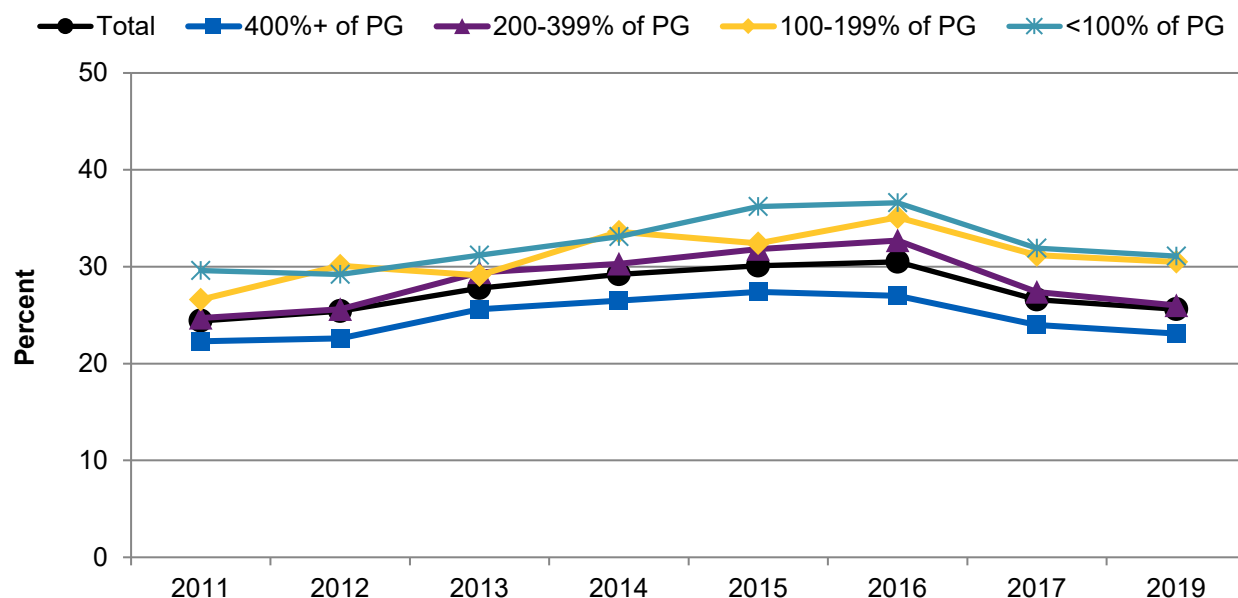**Note:** Data were unavailable for 2018.

- **Importance:** Many patients leave their healthcare visit unsure of what their provider asked them to do or what was discussed. Nationwide, only 12% of adults have proficient health literacy (Kutner, et al., 2006). That means almost 9 out of 10 Americans find it challenging "to obtain, process, and understand basic health information and services needed to make appropriate health decisions" (IOM, 2004). The use of strategies such as teach-back and shared decision making are contributing to improvements in patient-provider communication. Breakdowns in communication still exist and require close examination of modes of communication, implicit bias, and trust building (Boulware, et al., 2003).

- **Trends:** From 2011 to 2019, there were no statistically significant changes for any insurance category in the percentage of adults who had a doctor's office or clinic visit in the last 12 months whose health providers always asked them to describe how they would follow the instructions.
- **Groups With Disparities, 2019:**

  - The percentage of adults who had a doctor's office or clinic visit in the last 12 months whose health providers always asked them to describe how they would follow the instructions was higher among adults with public insurance and uninsured adults compared with adults with any private insurance (32.0% and 30.1%, respectively, vs. 24.1%).

Adults Whose Health Providers Give Easy-to-Understand Instructions, by Race/Ethnicity

Adults who had a doctor's office or clinic visit in the last 12 months whose health providers always gave them easy-to-understand instructions about what to do for a specific illness or health condition, by race/ethnicity, 2011-2019

Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2011-2019.
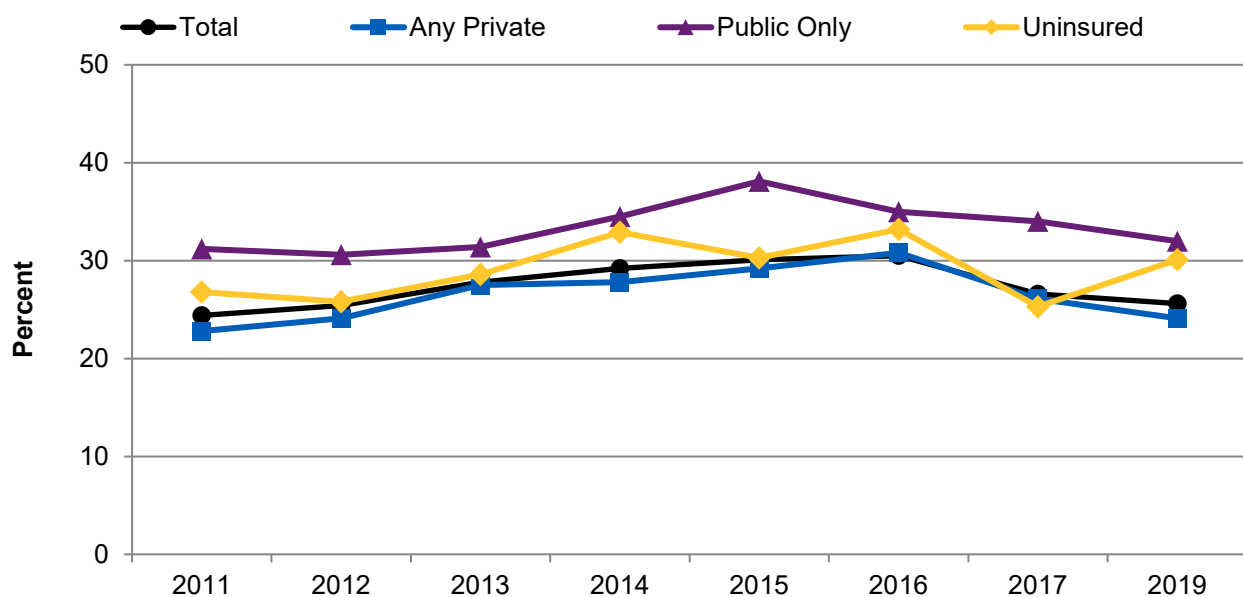**Note:** White, Black, and Asian are non-Hispanic. Hispanic includes all races. Data were unavailable for 2018.

- **Importance:** Many patients leave their healthcare visit unsure of what their provider asked them to do or what was discussed. Nationwide, only 12% of adults have proficient health literacy (Kutner, et al., 2006). That means almost 9 out of 10 Americans find it challenging "to obtain, process, and understand basic health information and services needed to make appropriate health decisions" (IOM, 2004). The use of strategies such as teach-back and shared decision making are contributing to improvements in patient-provider communication. Breakdowns in communication still exist and require close examination of modes of communication, implicit bias, and trust building (Boulware, et al., 2003).
- **Overall Percentage:** From 2011 to 2019, the percentage of adults who had a doctor's office or clinic visit in the last 12 months whose health providers always gave them easy-to-understand instructions increased overall, from 64.1% to 70.2%.

- **Groups With Disparities, 2019:**

  - The percentage of Hispanic adults who had a doctor's office or clinic visit in the last 12 months whose health providers always gave them easy-to-understand instructions was lower compared with White adults (66.1% vs. 71.6%).

Adults Whose Health Providers Give Easy-to-Understand Instructions, by Age

Adults who had a doctor's office or clinic visit in the last 12 months whose health providers always gave them easy-to-understand instructions about what to do for a specific illness or health condition, by age, 2011-2019

Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2011-2019.
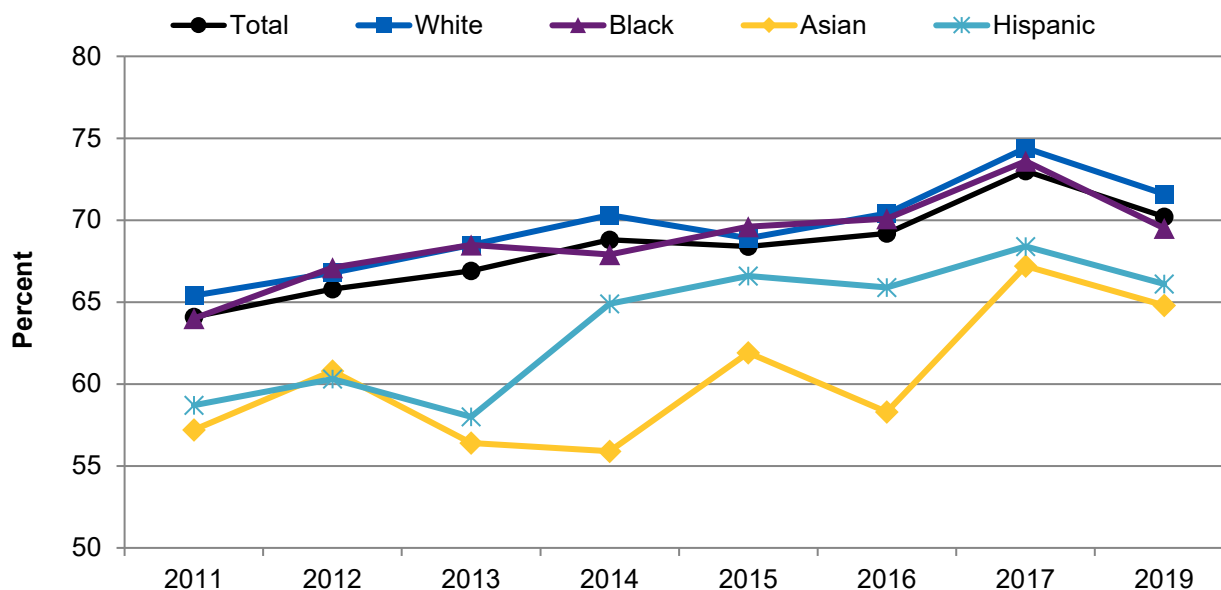**Note:** Data were unavailable for 2018.

- **Importance:** Many patients leave their healthcare visit unsure of what their provider asked them to do or what was discussed. Nationwide, only 12% of adults have proficient health literacy (Kutner, et al., 2006). That means almost 9 out of 10 Americans find it challenging "to obtain, process, and understand basic health information and services needed to make appropriate health decisions" (IOM, 2004). The use of strategies such as teach-back and shared decision making are contributing to improvements in patient-provider communication. Breakdowns in communication still exist and require close examination of modes of communication, implicit bias, and trust building (Boulware, et al., 2003).

- **Groups With Disparities, 2019:**

  - The percentages of adults ages 18-44, 45-64, and 65 and over who had a doctor's office or clinic visit in the last 12 months whose health providers always gave them easy-to-understand instructions were all similar (70.2%, 70.7%, and 69.7%, respectively).

Adults Whose Health Providers Give Easy-to-Understand Instructions, by Income

Adults who had a doctor's office or clinic visit in the last 12 months whose health providers always gave them easy-to-understand instructions about what to do for a specific illness or health condition, by income, 2011-2019

Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2011-2019.
Note: Data were unavailable for 2018. PG refers to the federal poverty guideline.
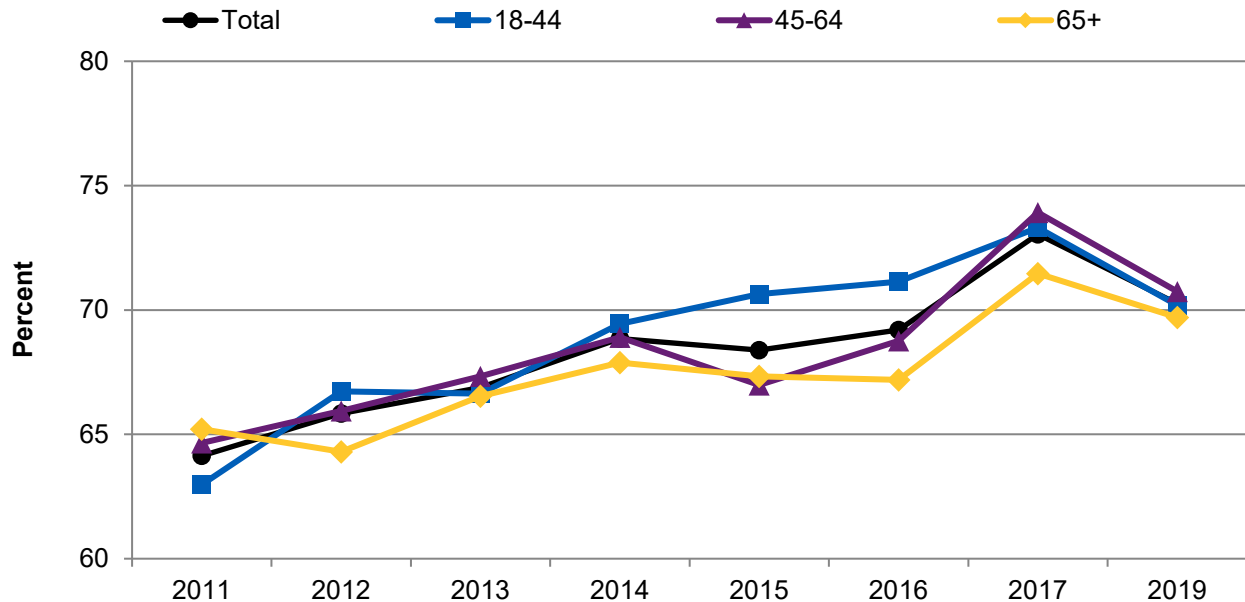
- **Importance:** Many patients leave their healthcare visit unsure of what their provider asked them to do or what was discussed. Nationwide, only 12% of adults have proficient health literacy (Kutner, et al., 2006). That means almost 9 out of 10 Americans find it challenging "to obtain, process, and understand basic health information and services needed to make appropriate health decisions" (IOM, 2004). The use of strategies such as teach-back and shared decision making are contributing to improvements in patient-provider communication. Breakdowns in communication still exist and require close examination of modes of communication, implicit bias, and trust building (Boulware, et al., 2003).
- **Groups With Disparities, 2019:**

  - The percentage of adults who had health providers give them easy-to-understand instructions was lower for adults with an income less than 100% of PG compared with adults with an income 400% of PG or more (64.3% vs. 73.3%).

Adults Whose Health Providers Give Easy-to-Understand Instructions, by Insurance

Adults who had a doctor's office or clinic visit in the last 12 months whose health providers always gave them easy-to-understand instructions about what to do for a specific illness or health condition, by insurance, 2011-2019
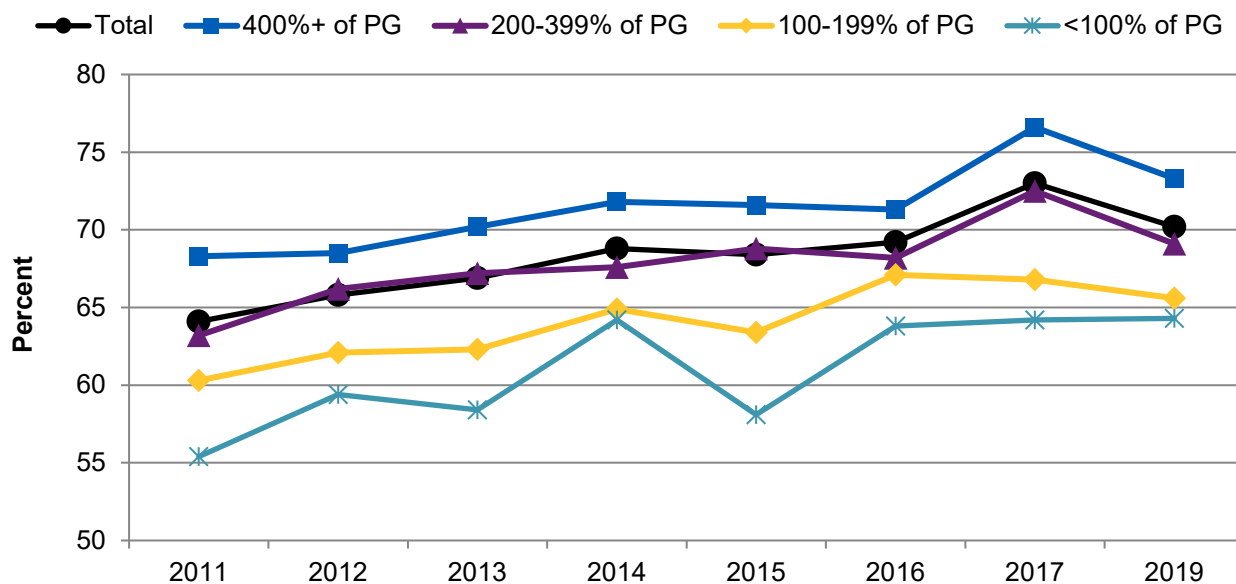

Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2011-2019.
Note: Data were unavailable for 2018.

- **Importance:** Many patients leave their healthcare visit unsure of what their provider asked them to do or what was discussed. Nationwide, only 12% of adults have proficient health literacy (Kutner, et al., 2006). That means almost 9 out of 10 Americans find it challenging "to obtain, process, and understand basic health information and services needed to make appropriate health decisions" (IOM, 2004). The use of strategies such as teach-back and shared decision making are contributing to improvements in patient-provider communication. Breakdowns in communication still exist and require close examination of modes of communication, implicit bias, and trust building (Boulware, et al., 2003).
- **Groups With Disparities, 2019:**

  - The percentage of adults who had health providers who always gave them easy-to-understand instructions was lower among adults with public insurance and uninsured adults compared with adults with any private insurance (63.7% and 59.2%, respectively, vs. 72.4%).

Adults Whose Home Health Providers Always Explained Things Well, by Race/Ethnicity

Adults who reported that home health providers always explained things in a way that was easy to understand in the last 2 months of care, by race/ethnicity, 2012-2022
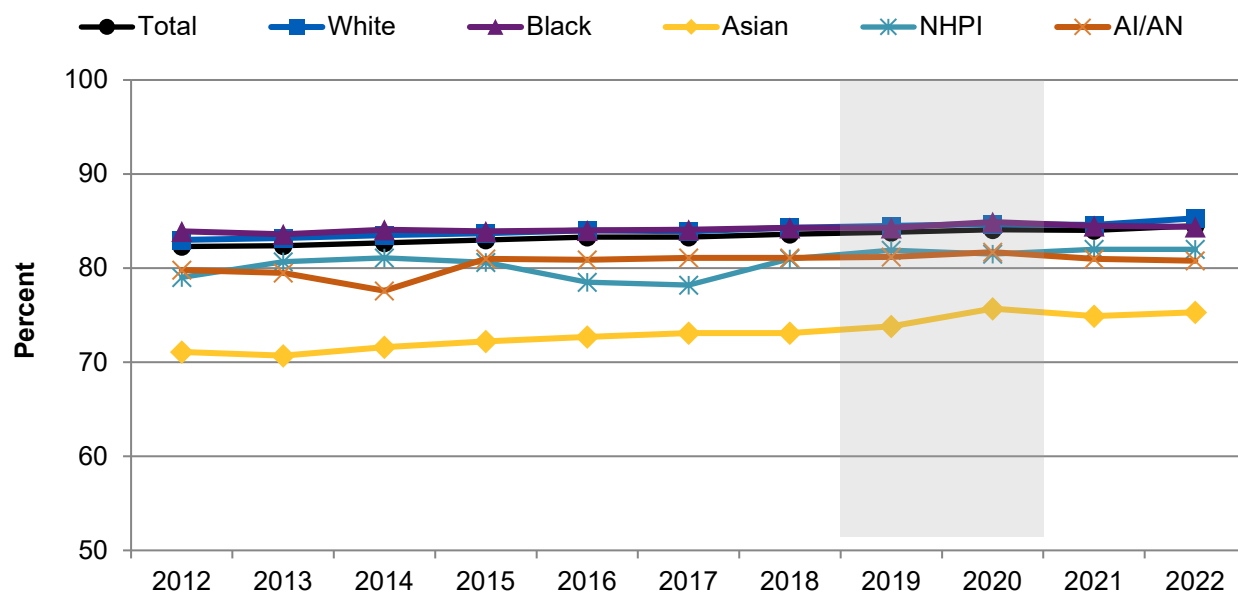
Key: AI/AN = American Indian or Alaska Native; NHPI = Native Hawaiian/Pacific Islander.
Source: Centers for Medicare & Medicaid Services, Home Health Care Consumer Assessment of Healthcare Providers and Systems, 2012-2022.
Note: White, Black, Asian, NHPI, and AI/AN are non-Hispanic. Hispanic includes all races. Shaded area indicates data impacted by the COVID-19 public health emergency.

- **Importance:** Overall, effective communication leads to increased patient and clinician satisfaction, increased trust with the clinician, and functional and psychological well-being. Effective communication also leads to improved outcomes in specific diseases, including heart disease, diabetes, and hypertension (Chou, 2018).
- **Overall Percentage:** In 2022, 84.5% of adults reported that home health care providers always explained things in a way that was easy to understand in the last 2 months of care.
- **Groups With Disparities, 2022:**

  - The percentage of adults who had a home health care visit in the last 12 months and had healthcare providers who always explained things in a way they could understand was higher among White and Black adults than Asian adults (85.3% and 84.4%, respectively, vs. 75.3%).

Adults Whose Home Health Providers Always Explained Things Well, by Age

Adults who reported that home health providers always explained things in a way that was easy to understand in the last 2 months of care, by age, 2012-2022
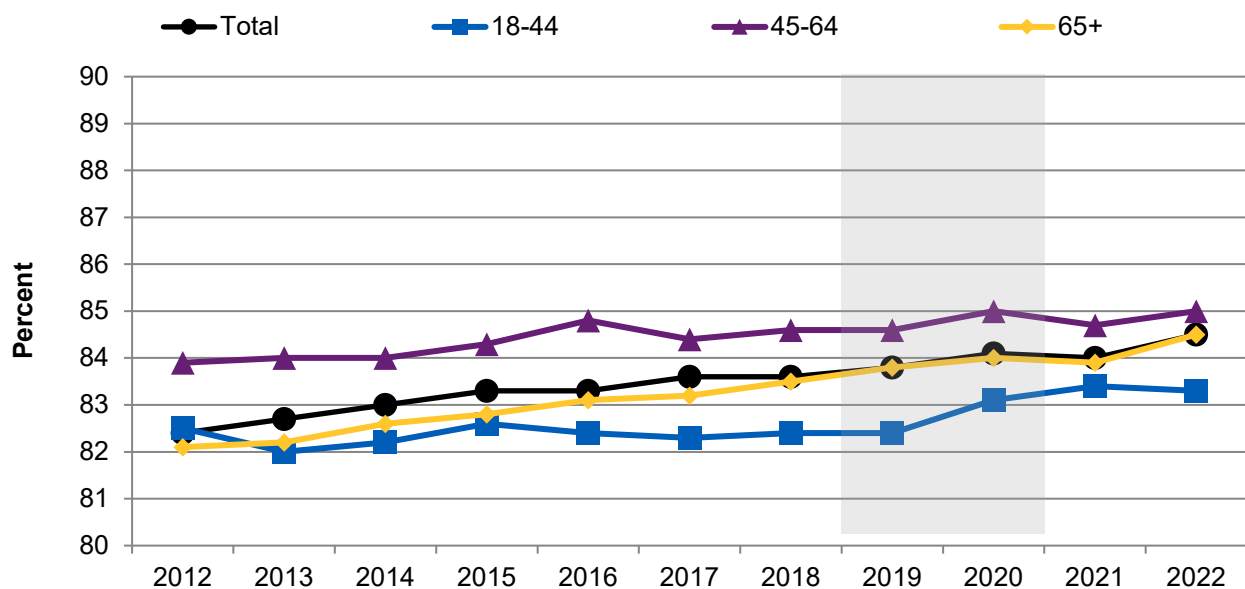
Source: Centers for Medicare & Medicaid Services, Home Health Care Consumer Assessment of Healthcare Providers and Systems, 2012-2022.
Note: Shaded area indicates data impacted by the COVID-19 public health emergency.

- **Importance:** Overall, effective communication leads to increased patient and clinician satisfaction, increased trust with the clinician, and functional and psychological well-being. Effective communication also leads to improved outcomes in specific diseases, including heart disease, diabetes, and hypertension (Chou, 2018).
- **Groups With Disparities, 2022:**

  - There were no statistically significant disparities between age groups.

Tools for Improving Patient Safety and Communication With Patients and Families

AHRQ patient engagement and health literacy tools support improved communication with patients and families. They include:

- Tools for Engaging Patients and Families in Their Health Care, which includes the Guide to Improving Patient Safety in Primary Care Settings by Engaging Patients and Families, featuring a teach-back intervention.
- AHRQ's health literacy microsite, which includes improvement tools such as the AHRQ Health Literacy Universal Precautions Toolkit, designed to promote better understanding by all patients.
- Toolkit for Engaging Patients To Improve Diagnostic Safety, which includes the strategies Be The Expert On You and 60 Seconds To Improve Diagnostic Safety that help enhance communication and information sharing within the patient-provider encounter.

Patient Safety Tools, Resources, and Programs Across Multiple Settings

Patient safety infrastructure varies by state and healthcare facility. Patient safety and quality issues in ambulatory care settings, hospitals, and medical offices relative to safety culture are described in data from the:

- AHRQ Ambulatory Surgery Center Survey on Patient Safety Culture.
- AHRQ Hospital Survey on Patient Safety Culture.
- AHRQ Medical Office Survey on Patient Safety Culture.

The AHRQ Surveys on Patient Safety Culture® (SOPS)® enable healthcare organizations to assess how their staff perceive various aspects of patient safety culture in their facility or office.

Surveys on Patient Safety Culture Ambulatory Surgery Center Survey

- Data source: 2023 AHRQ SOPS Ambulatory Surgery Center (ASC) Survey Database, which includes:

  - Survey data from 7,458 respondents representing 243 ACSs.
  - Data from surveys completed from January 2022 to June 2023.
  - Self-selected sample of U.S. ASCs, including less than 5% of all ASCs in the United States.

- Results provided for:

  - Patient safety culture composite measures and composite measure average.
  - Trending patient safety composite measure results from 2020 to 2023.

The results presented include: (1) the average percent positive, neutral, and negative for each of the eight ASC patient safety culture composite measures; (2) the composite measure average, which is the average of the unrounded composite measure scores; and (3) trending results of the average percent positive for the composite measures from the 2020, 2021, and 2023 Database reports.

Ambulatory Surgery Centers in the Survey on Patient Safety Culture ASC Database

Each ASC must have at least five completed surveys. Only current ASC providers and staff are eligible to contribute data. The following requirements must be met for inclusion:

- Approved ASCs in a specific location with a valid CMS Certification Number
- ASCs that operate exclusively to provide surgical/procedural services to patients who do not require hospitalization (except in unusual circumstances)
- ASCs that do not share space with a hospital or hospital outpatient surgery department
- ASCs located in the United States or in a U.S. territory

ASCs, health systems, management companies, or survey vendors that have administered the AHRQ Ambulatory Surgery Center Survey on Patient Safety Culture indicate their interest in participating in the database by registering with AHRQ; interested submitters are notified regarding their eligibility for participation. More information on the survey is online at https://www.ahrq.gov/sops/surveys/asc/index.html.

Ambulatory Surgery Center Survey Results

Average percent positive, neutral, and negative responses for composite measures, January 2022-June 2023

■ Average Percent Positive Response   ■ Average Percent Neutral Response
□ Average Percent Negative Response

Composite Measure	Positive	Neutral	Negative
Organizational Learning – Continuous Improvement	91%	6%	3%
Communication About Patient Information	89%	8%	3%
Management Support for Patient Safety	89%	8%	3%
Communication Openness	89%	8%	3%
Teamwork	87%	8%	6%
Response to Mistakes	85%	10%	5%
Staff Training	80%	13%	7%
Staffing, Work Pressure, and Pace	72%	21%	7%
Composite Measure Average	85%	10%	5%

Source: 2023 AHRQ SOPS Ambulatory Surgery Center Survey Database. Respondents completed the survey between January 2022 through June 2023.
Note: (1) The composite measure average score is the average of the eight unrounded composite measure scores. (2) For these measures, higher average percent positive is better. (3) The number of ASCs in the Database is 243. (4) Average negative percentages ≤7% are shifted to the right of the chart.

- **Importance:** ASCs can examine patient safety culture areas that have the lowest percent positive scores and highest percent negative scores to identify areas to focus on for patient safety culture improvement.
- **Areas of Strength and Weakness:**

  - Organizational Learning – Continuous Improvement had the highest average percent positive response (91 percent positive) and lowest percent negative response (3 percent negative).
  - Staffing, Work Pressure, and Pace had the lowest average percent positive response (72 percent positive) and the highest average percent negative response (7 percent negative).

Ambulatory Surgery Center Survey Results Over Time

Highest Ambulatory Surgery Center Results Over Time – 2020-2023
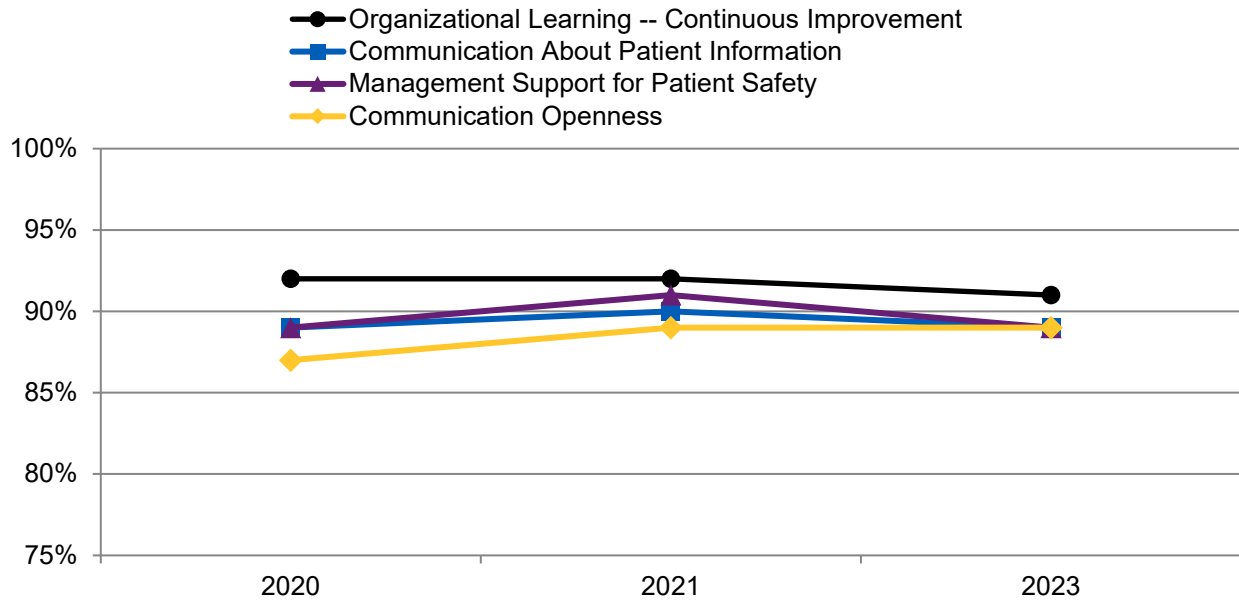
Source: AHRQ SOPS Ambulatory Surgery Center Survey User Database Reports, 2020-2023.
Note: (1) Results show the patient safety culture percent positive scores where higher scores are better. (2) The results displayed only include the four highest scoring patient safety culture measures.

- **Importance:** AHRQ started the SOPS ASC Database in 2020, with data submission approximately every other year to assess the state of patient safety culture in the ASC setting. It is important not only to examine scores at a given point in time, but also to identify areas that are improving or declining over time.
- **Results:** ASC patient safety culture scores in these areas generally remained steady from 2020 to 2023, with maximum changes of +/− 2 percentage points.

Lowest Ambulatory Surgery Center Results Over Time – 2020-2023
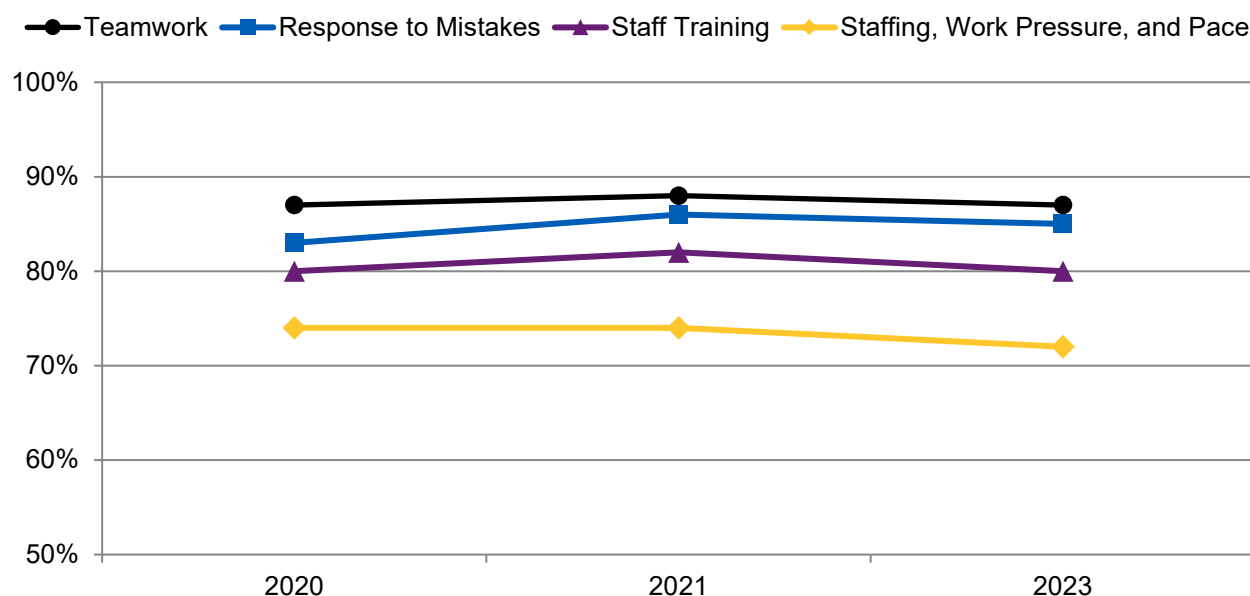
Source: AHRQ SOPS Ambulatory Surgery Center Survey User Database Reports, 2020-2023.
Note: (1) Results show the patient safety culture percent positive scores where higher scores are better. (2) The results displayed only include the four lowest scoring patient safety culture measures.

- **Importance:** AHRQ started the SOPS ASC Database in 2020, with data submission approximately every other year to assess the state of patient safety culture in the ambulatory surgery center setting. It is important not only to examine scores at a given point in time, but also to identify areas that are improving or declining over time.

  - **Results:** ASC patient safety culture scores in these areas generally remained steady from 2020 to 2023, with maximum changes of +/− 3 percentage points.

Data Sources for Trending Ambulatory Surgery Center Survey Data

SOPS ASC Database Report Year	2020	2021	2023
Survey Administration Period	May 2014-July 2019	August 2020-June 2021	January 2022-June 2023
Number of ASCs	282	235	243
Number of Respondents	10,527	8,918	7,458

Source: AHRQ SOPS Ambulatory Surgery Center Survey User Database Reports, 2020-2023.

Surveys on Patient Safety Culture Diagnostic Safety Supplemental Item Set for Medical Offices

- Data source: 2024 AHRQ SOPS Diagnostic Safety Supplemental Item Set for Medical Offices Database, which includes:

  - Survey data from 760 respondents representing 102 medical offices (18 medical offices from the 2022 Medical Office Database and 84 medical offices from the 2024 Medical Office Database.
  - Data from surveys completed from September 2021 to September 2023.
  - Self-selected sample of U.S. medical offices, including less than 1% of all medical offices in the United States.
  - The supplemental item set was administered toward the end of the SOPS Medical Office Survey, before the background questions.

- Results provided for:

  - Diagnostic safety composite measures, composite measure average.

Medical Offices in the SOPS Medical Office Database

- A medical office is an outpatient facility in a specific location.
- Each medical office located in a building containing multiple medical offices is considered a separate medical office.
- If multiple providers work in a single medical office, a medical office is defined as any providers who share administrative and clinical support staff.

To be included, medical offices must be located in the United States or in a U.S. territory. Each medical office must have at least five completed surveys. Only current medical office providers and staff are eligible to contribute data. Medical offices, health systems, or survey vendors that have administered the AHRQ Medical Office Survey on Patient Safety Culture indicate their interest in participating in the database by registering with AHRQ; interested submitters are notified regarding their eligibility for participation. More information on the survey is available online at https://www.ahrq.gov/sops/databases/medical-office/submission.html.

Medical Office Diagnostic Safety Supplemental Item Set Results

Average percent positive, neutral, and negative responses for composite measures, September 2021 to September 2023
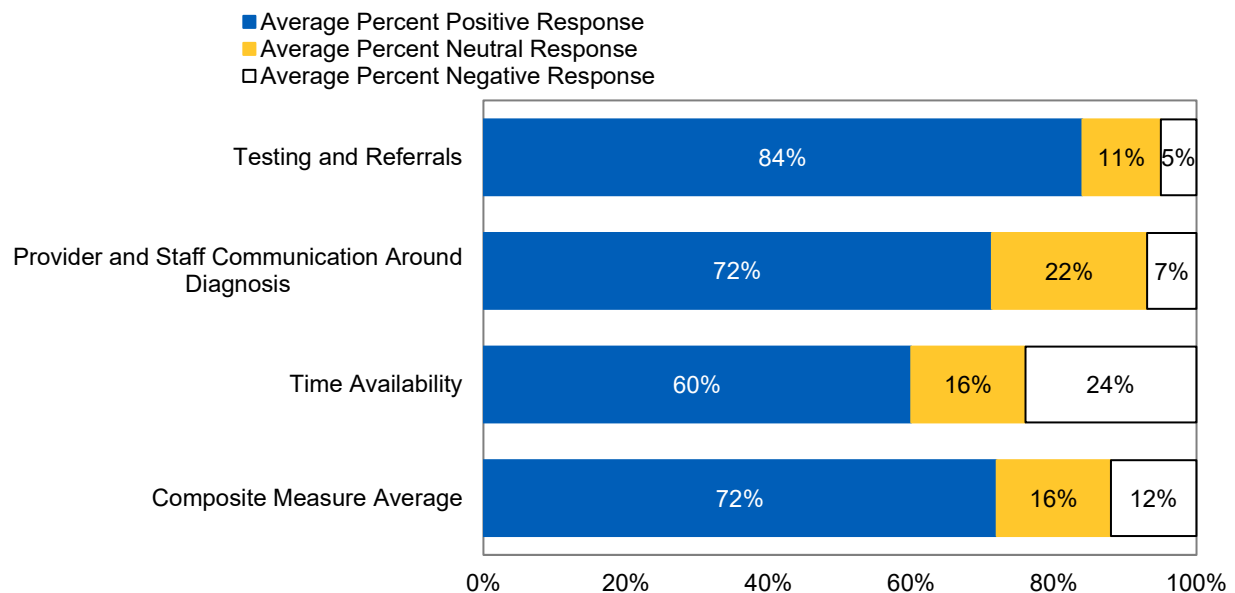
■ Average Percent Positive Response
■ Average Percent Neutral Response
□ Average Percent Negative Response

Measure	Positive	Neutral	Negative
Testing and Referrals	84%	11%	5%
Provider and Staff Communication Around Diagnosis	72%	22%	7%
Time Availability	60%	16%	24%
Composite Measure Average	72%	16%	12%

(x-axis: 0% 20% 40% 60% 80% 100%)

Source: 2024 AHRQ SOPS Diagnostic Safety Supplemental Item Set for Medical Offices Database. Respondents completed the survey between September 2021 and September 2023.
Notes: (1) The composite measure average score is the average of the three unrounded composite measure scores. (2) For these measures, higher average percent positive is better. (3) The number of medical offices in the Database is 102.

- **Importance:** As medical offices aim to support the diagnostic process, accurate diagnoses, and communication around diagnoses, assessing a culture of diagnostic safety can help them identify areas that have the lowest percent positive scores and highest percent negative scores to identify areas to focus on for diagnostic safety culture improvement.
- **Areas of Strength and Weakness:**

  - Testing and Referrals had the highest average percent positive response (84 percent positive) and lowest percent negative response (5 percent negative).
  - Time Availability had the lowest average percent positive response (60 percent positive) and the highest percent negative response (24 percent negative).

Surveys on Patient Safety Culture Medical Office Survey

- Data source: 2024 AHRQ SOPS Medical Office Survey Database, which includes:

  - Survey data from 15,449 respondents representing 1,164 medical offices.
  - Data from surveys completed from November 2021 to September 2023.
  - Self-selected sample of U.S. medical offices, including less than 1% of all medical offices in the United States.

- Results provided for:

  - Patient safety culture composite measures and composite measure average.
  - Trending patient safety composite measure results from 2012 to 2024.

The results presented include: (1) the average percent positive, neutral, and negative for each of the 10 patient safety composite measures; (2) the composite measure average, which is the average of the unrounded composite measure scores; and (3) trending results of the average percent positive score for the composite measures from the 2012, 2014, 2016, 2018, 2020, 2022, and 2024 Database reports.

Medical Office Survey Results

Average percent positive, neutral, and negative responses for composite measures, November 2021-September 2023

■ Average Percent Positive Response ■ Average Percent Neutral Response □ Average Percent Negative Response

Composite Measure	Positive	Neutral	Negative
Patient Care Tracking/Followup	86%	10%	4%
Teamwork	85%	8%	6%
Organizational Learning	76%	16%	8%
Overall Perceptions of Patient Safety and Quality	73%	15%	12%
Communication About Error	73%	18%	10%
Staff Training	71%	16%	13%
Communication Openness	69%	19%	11%
Office Processes and Standardization	66%	18%	16%
Owner/Managing Partner/Leadership Support for Patient Safety	62%	20%	18%
Work Pressure and Pace	41%	24%	35%
Composite Measure Average	70%	16%	13%

Source: 2024 AHRQ SOPS Medical Office Survey Database. Respondents completed the survey between November 2021 and September 2023.
Note: (1) The composite measure average score is the average of the 10 unrounded composite measure scores. (2) For these measures, higher average percent positive is better. (3) The number of medical offices in the Database is 1,164. (4) Average percent negative percentages ≤7% are shifted to the right of the chart.

- **Importance:** Medical offices can examine patient safety culture areas that have the lowest percent positive scores and highest percent negative scores to identify areas to focus on for patient safety culture improvement.

- **Areas of Strength and Weakness:**

  - Patient Care Tracking/Followup had the highest average percent positive response (86 percent positive) and lowest percent negative responses (4 percent negative).
  - Work Pressure and Pace had the lowest average percent positive response (41 percent positive) and the highest percent negative response (35 percent negative).

Medical Office Results Over Time

Highest Medical Office Results Over Time – 2012-2024

Source: AHRQ SOPS Medical Office Survey 2024 User Database Report.
Note: (1) Results show the patient safety culture percent positive scores where higher scores are better. (2) The results displayed only include the three highest scoring patient safety culture measures.

- **Importance:** Since 2012, the SOPS Medical Office Database has collected data approximately every other year to assess the state of patient safety culture in the medical office setting. It is important not only to examine scores at a given point in time, but also to identify areas that are improving or declining over time.
- **Results:**

  - Patient safety culture in medical offices was negatively impacted by the effects of the COVID-19 pandemic.
  - Overall, from 2012 to 2020, medical office patient safety culture scores in these areas improved. However, from 2020 to 2022, during the COVID-19 pandemic, patient safety culture scores in these areas decreased, with the largest decrease in Organizational Learning.

Middle Medical Office Results Over Time – 2012-2024

Source: AHRQ SOPS Medical Office Survey 2024 User Database Report.
Note: (1) Results show the patient safety culture percent positive scores where higher scores are better. (2) The results displayed only include the four middle-scoring patient safety culture measures.

- **Importance:** Since 2012, the SOPS Medical Office Database has collected data approximately every other year to assess the state of patient safety culture in the medical office setting. It is important not only to examine scores at a given point in time, but also to identify areas that are improving or declining over time.
- **Results:**

  - Patient safety culture in medical offices was negatively impacted by the effects of the COVID-19 pandemic.
  - Overall, from 2012 to 2020, patient safety culture scores in these areas improved. However, from 2020 to 2022, during the COVID-19 pandemic, patient safety culture scores decreased in these areas.

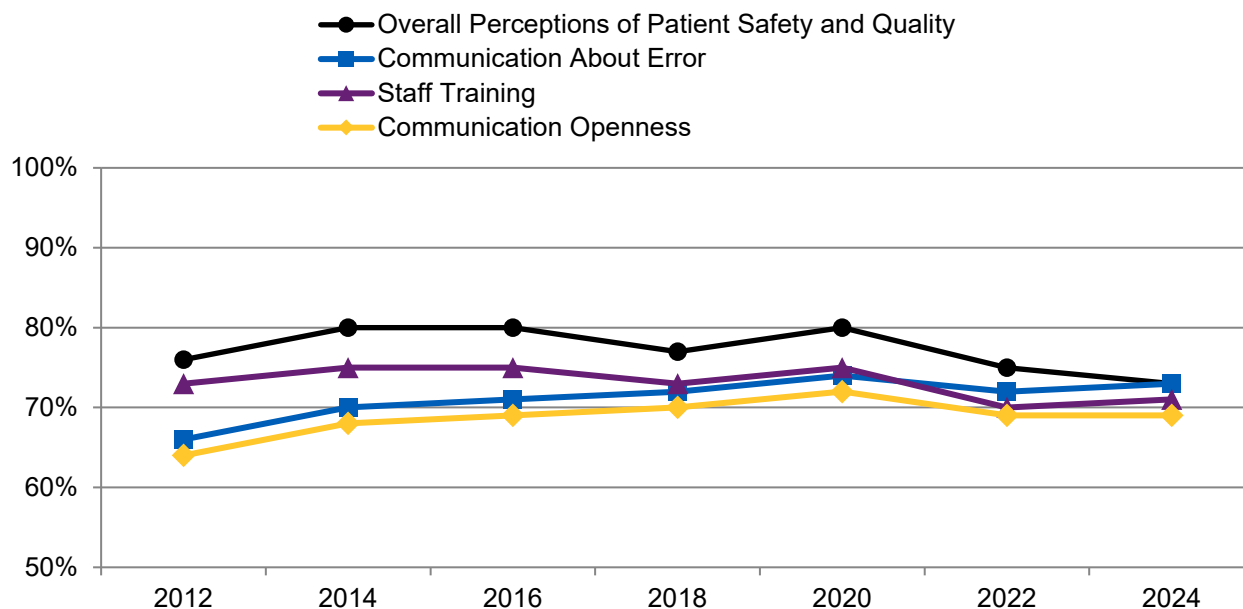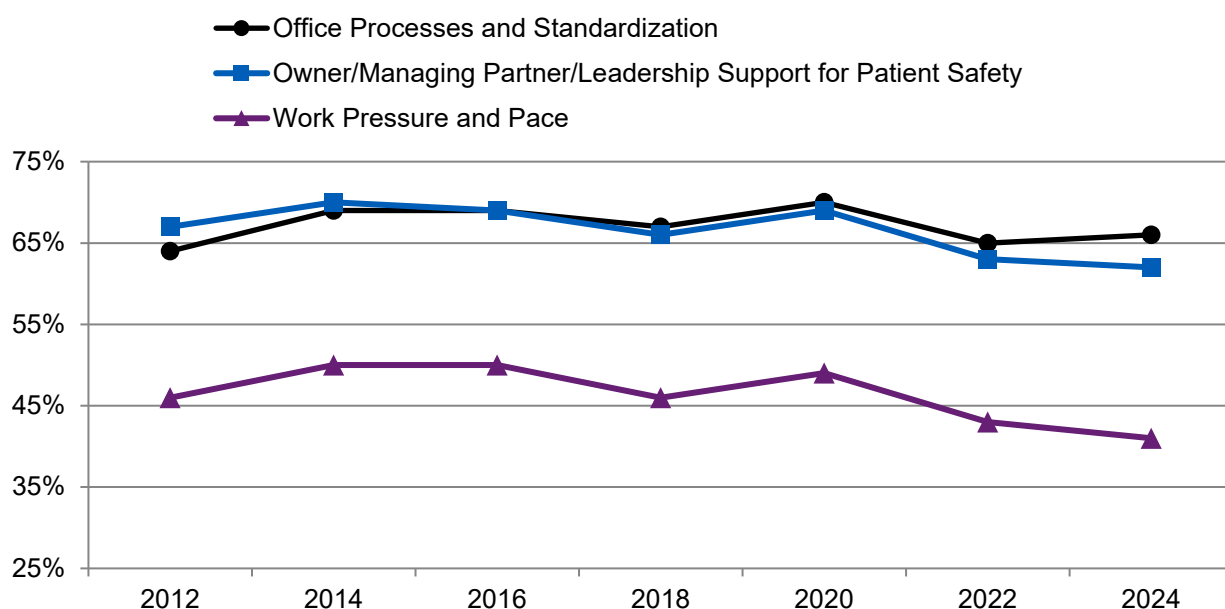**Lowest Medical Office Results Over Time – 2012-2024**

Source: AHRQ SOPS Medical Office Survey 2024 User Database Report.
Note: (1) Results show the patient safety culture percent positive scores where higher scores are better. (2) The results displayed only include the three lowest scoring patient safety culture measures.

- **Importance:** Since 2012, the SOPS Medical Office Database has collected data approximately every other year to assess the state of patient safety culture in the medical office setting. It is important not only to examine scores at a given point in time, but also to identify areas that are improving or declining over time.
- **Results:**

  - Patient safety culture in medical offices was negatively impacted by the effects of the COVID-19 pandemic.
  - Overall, from 2012 to 2020, patient safety culture scores in these areas fluctuated up and down, with overall improvement in 2020. However, from 2020 to 2022, during the COVID-19 pandemic, patient safety culture scores decreased.
  - From 2022 to 2024, Owner/Managing Partner/Leadership Support for Patient Safety and Work Pressure and Pace continued to decline.

Data Sources for Trending Medical Office Survey Data

SOPS Medical Office Database Report Year	2012	2014	2016	2018	2020	2022	2024
Survey Administration Period	Nov. 2009-Oct. 2011	Nov. 2011-Nov. 2013	Nov. 2013-Nov. 2015	Dec. 2015-Sept. 2017	Oct. 2017-Oct. 2019	Nov. 2019-Oct. 2021	Nov. 2021-Sept. 2023
Number of Medical Offices	934	935	1,528	2,437	1,475	1,100	1,164
Number of Respondents	23,679	27,103	25,127	35,523	18,396	13,277	15,449

Source: AHRQ SOPS Medical Office Survey 2024 User Database Report.

Surveys on Patient Safety Culture Nursing Home Survey

- Data source: 2023 AHRQ SOPS Nursing Home Survey Database, which includes:

  - Survey data from 3,224 respondents representing 62 nursing homes.
  - Data from surveys completed from January 2022 to September 2022.
  - Self-selected sample of U.S. nursing homes, including less than 1% of all nursing homes in the United States.

- Results provided for:

  - Patient safety culture composite measures and composite measure average.
  - Trending patient safety composite measures from 2011 to 2023.

The results presented include: (1) the average percent positive, neutral, and negative for each of the 12 nursing home patient safety culture composite measures; (2) the composite measure average, which is the average of the unrounded composite measure scores; (3) and trending results of the average percent positive for the composite measures from the 2011, 2014, 2016, 2019, and 2023 Database reports.

Nursing Home Survey Results

Average percent positive, neutral, and negative responses for composite measures, January 2022-September 2022

■ Average Percent Positive Response ■ Average Percent Neutral Response □ Average Percent Negative Response

Measure	Positive	Neutral	Negative
Feedback & Communication About Incidents	83%	13%	4%
Overall Perceptions of Resident Safety	81%	13%	6%
Supervisor Expectations & Actions Promoting Resident Safety	79%	13%	8%
Organizational Learning	64%	22%	14%
Training & Skills	64%	18%	18%
Management Support for Resident Safety	63%	19%	19%
Handoffs	62%	26%	12%
Teamwork	61%	19%	20%
Compliance With Procedures	58%	21%	20%
Communication Openness	54%	27%	19%
Nonpunitive Response to Mistakes	53%	28%	19%
Staffing	39%	22%	38%
Composite Measure Average	64%	20%	16%

Source: 2023 AHRQ SOPS Nursing Home Survey Database. Respondents completed the survey from January 2022 through September 2022.

Notes: (1) The composite measure average score is the average of the 12 unrounded composite measure scores. (2) For these measures, higher average percent positive is better. (3) The number of nursing homes in the Database is 62. (4) Average negative percentages ≤7% are shifted to the right of the chart.
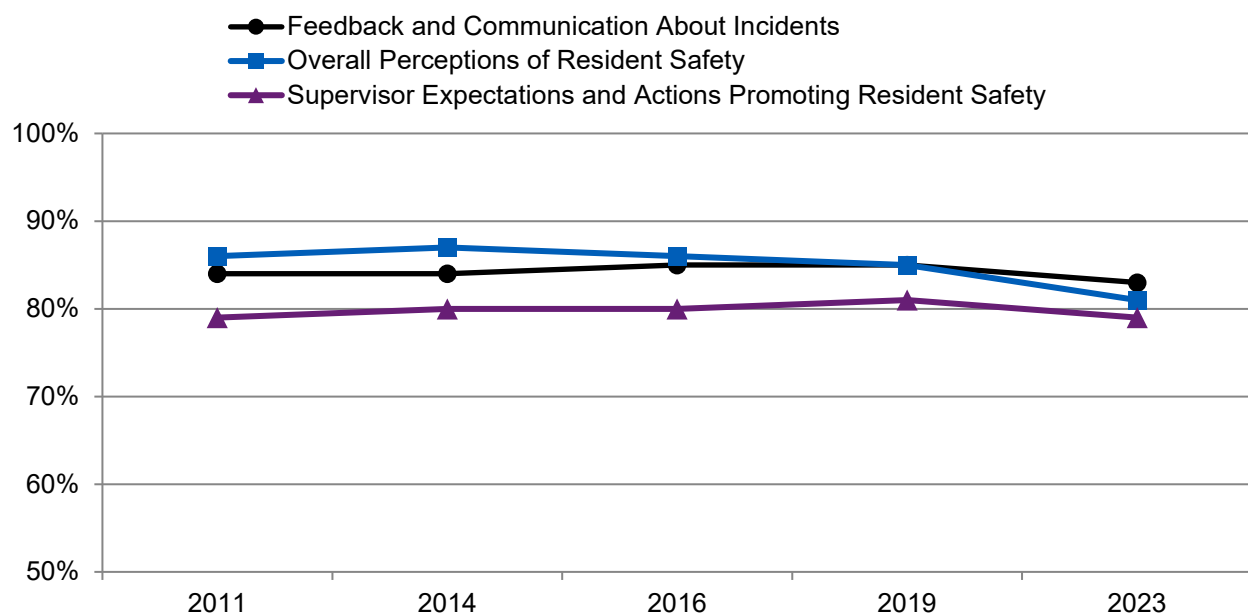
- **Importance:** Nursing homes can examine resident safety culture areas that have the lowest percent positive scores and highest percent negative scores to identify areas to focus on for safety culture improvement.
- **Areas of Strength and Weakness:**

  - Feedback & Communication About Incidents had the highest average percent positive response (83 percent positive) and lowest percent negative response (4 percent negative).
  - Staffing had the lowest average percent positive response (39 percent positive) and the highest average percent negative response (38 percent negative).

Nursing Home Results, Over Time
Highest Nursing Home Results Over Time – 2011-2023

Source: AHRQ SOPS Nursing Home Survey User Database Reports, 2011-2023.
Note: (1) Results show the patient safety culture percent positive scores where higher scores are better. (2) The results displayed only include the three highest scoring patient safety culture measures.

- **Importance:** AHRQ started the SOPS Nursing Home Database in 2011, with data collection approximately every other year to assess the state of patient safety culture in the nursing home setting. It is important not only to examine scores at a given point in time, but also to identify areas that are improving or declining.
- **Results:**

  - Resident safety culture in nursing homes was negatively impacted by the effects of the COVID-19 pandemic.
  - Resident safety culture in these areas within nursing homes generally remained steady from 2011 to 2019, then decreased 2 to 4 percentage points after the COVID-19 pandemic.

Middle Nursing Home Results Over Time Part 1 – 2011-2023

Source: AHRQ SOPS Nursing Home Survey User Database Reports, 2011-2023.
Note: (1) Results show the patient safety culture percent positive scores where higher scores are better. (2) The results displayed only include the three highest middle-scoring patient safety culture measures.

- **Importance:** AHRQ started the SOPS Nursing Home Database in 2011, with data collection approximately every other year to assess the state of patient safety culture in the nursing home setting. It is important not only to examine scores at a given point in time, but also to identify areas that are improving or declining.
- **Results:**

  - Resident safety culture in nursing homes was negatively impacted by the effects of the COVID-19 pandemic.
  - Resident safety culture in these areas within nursing homes generally decreased 2 percentage points from 2011 to 2019, with larger decreases (5 percentage points) after the COVID-19 pandemic.

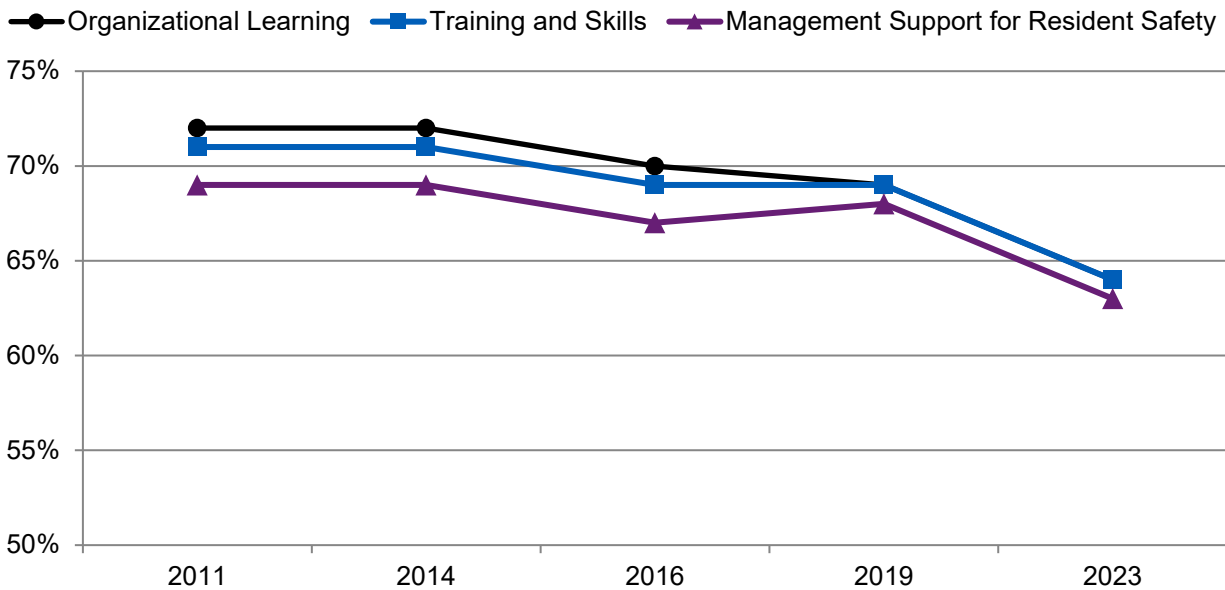**Middle Nursing Home Results Over Time Part 2 – 2011-2023**

Source: AHRQ SOPS Nursing Home Survey User Database Reports, 2011-2023.
Note: (1) Results show the patient safety culture percent positive scores where higher scores are better. (2) The results displayed only include the three lowest middle-scoring patient safety culture measures.

- **Importance:** AHRQ started the SOPS Nursing Home Database in 2011, with data collection approximately every other year to assess the state of patient safety culture in the nursing home setting. It is important not only to examine scores at a given point in time, but also to identify areas that are improving or declining.
- **Results:**

  ■ Resident safety culture in nursing homes was negatively impacted by the effects of the COVID-19 pandemic.
  ■ Resident safety culture in these areas within nursing homes increased slightly from 2011 to 2019, with Handoffs decreasing by 1 percentage point in 2023 . However, resident safety culture in the other areas had larger decreases (5 percentage points and 7 percentage points) after the COVID-19 pandemic.

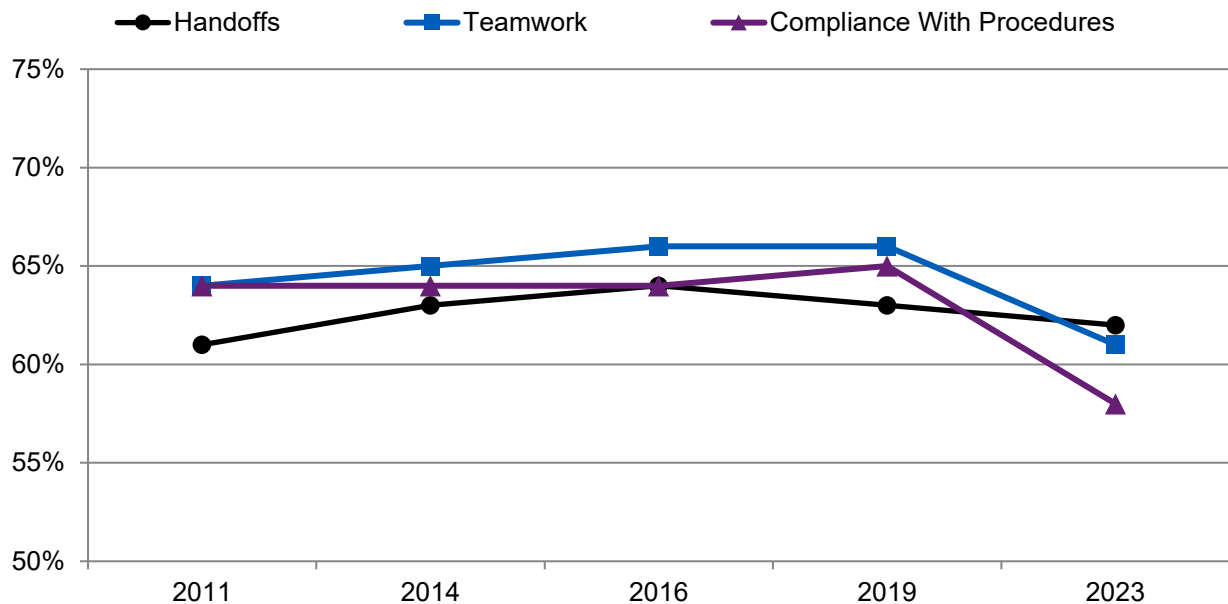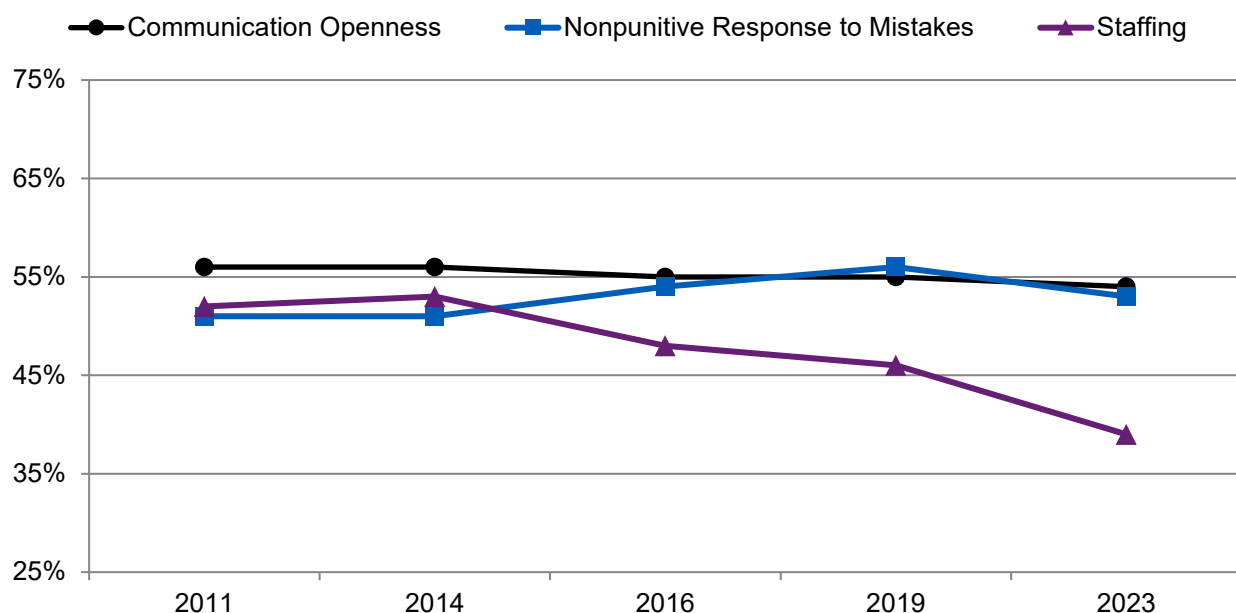**Lowest Nursing Home Results Over Time – 2011-2023**

Source: AHRQ SOPS Nursing Home Survey User Database Reports, 2011-2023.
Note: (1) Results show the patient safety culture percent positive scores where higher scores are better. (2) The results displayed only include the three lowest scoring patient safety culture measures.

- **Importance:** AHRQ started the SOPS Nursing Home Database in 2011, with data collection approximately every other year to assess the state of patient safety culture in the nursing home setting. It is important not only to examine scores at a given point in time, but also to identify areas that are improving or declining.
- **Results:**

  ■ Resident safety culture in medical offices was negatively impacted by the effects of the COVID-19 pandemic.
  ■ Resident safety culture in these areas within nursing homes generally decreased from 2011 to 2019, with the exception of Nonpunitive Response to Mistakes, which increased. However, resident safety culture in these areas decreased after the COVID-19 pandemic, with the largest decrease in Staffing.

Data Sources for Trending Nursing Home Survey Data

SOPS Nursing Home Database Report Year	2011	2014	2016	2019	2023
Survey Administration Dates	Jan. 2008-Feb. 2011	Jan. 2009-May 2014	Jan. 2014-Apr. 2016	Jan. 2016-Jul. 2018	Jan. 2022-Sept. 2022
Number of Nursing Homes	226	263	209	191	62
Number of Respondents	16,155	18,968	12,395	10,499	3,224

Source: AHRQ SOPS Nursing Home Survey User Database Reports, 2011-2023.

Patient Safety Organization Program

Infrastructure for patient safety improvement varies by state and healthcare facility. The AHRQ Patient Safety Organization (PSO) Program was created as a result of the Patient Safety and Quality Improvement Act of 2005 (PSQIA) (https://pso.ahrq.gov/legislation). AHRQ supports implementation of the PSQIA except for the confidentiality and related enforcement provisions delegated to the Office for Civil Rights.

PSOs have eight required patient safety activities:

- Efforts to improve patient safety and the quality of healthcare delivery
- Collection and analysis of patient safety work product
- Development and dissemination of information with respect to improving patient safety, such as recommendations, protocols, and information regarding best practices
- Utilization of patient safety work product for the purposes of encouraging a culture of safety and providing feedback and assistance to effectively minimize patient risk
- Maintenance of procedures to preserve confidentiality with respect to patient safety work product
- Provision of appropriate security measures with respect to patient safety work product
- Use of qualified staff
- Activities related to the operation of a patient safety evaluation system and provision of feedback to participants in a patient safety evaluation system

PSOs engage with healthcare providers in patient safety and healthcare quality improvement activities. When a provider works with a PSO, many of the following long-recognized impediments to successful improvement projects can be overcome:

- **Provider fear of increased liability from participating in quality initiatives:** The law provides confidentiality protections and privilege protections (inability to introduce the protected information in a legal proceeding) when certain requirements are met.
- **Inability of all licensed or certified healthcare facilities and clinicians to participate:** Unlike state protections that often target hospitals or physicians, these protections are broad.
- **Lack of nationwide and uniform protections:** These protections are especially valuable for systems with facilities in multiple states; a corporate system can share its protected data systemwide with all of its affiliated providers if it chooses to do so.
- **Insufficient volume:** Patient safety events are often too rare for a facility to identify causal factors with certainty. Each provider benefits from the insights it can obtain from a PSO that aggregates large volumes of event data from multiple providers. Moreover, their data remain protected even when the PSO aggregates them with data from other providers.
- **Inability to protect deliberations or analyses at a facility:** The law permits providers to undertake deliberations and analyses at their facilities that become protected as patient safety work product immediately as long as they are conducted in the provider's Patient Safety Evaluation System.

More information on how to become a Patient Safety Organization is available at https://pso.ahrq.gov/become_PSO.

Number of Patient Safety Organizations

Total number of Patient Safety Organizations by year, 2008-2022
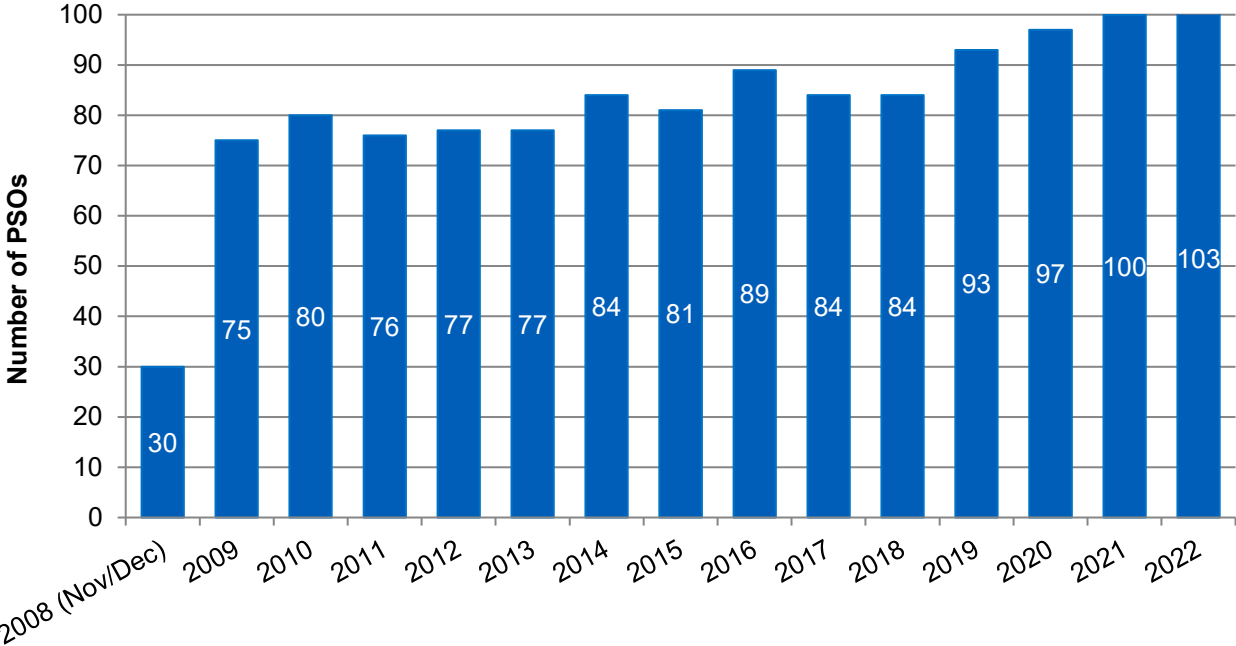
Source: Agency for Healthcare Research and Quality, Patient Safety Organizations Program, 2008-2022.
Note: The counts represent the total number of listed PSOs recorded by December 31 each year.

- **Importance:** The PSO program has grown over time, and most participating PSOs have remained continuously listed since their initial listing dates. This continuity allows the PSOs to work closely with contracted providers to support quality and safety activities to fulfill the eight required patient safety activities noted above.
- **Past Data on the Number of New PSOs Listed Each Year:** The number of new PSOs that have joined the program has differed annually, and some PSOs have left the program. Over the past 14 years, these were the total number of new PSOs each year:

  - 2008: 30 PSOs
  - 2009: 45 PSOs
  - 2010: 19 PSOs
  - 2011: 13 PSOs
  - 2012: 13 PSOs
  - 2013: 8 PSOs
  - 2014: 12 PSOs
  - 2015: 6 PSOs
  - 2016: 12 PSOs
  - 2017: 5 PSOs
  - 2018: 4 PSOs
  - 2019: 9 PSOs
  - 2020: 4 PSOs
  - 2021: 3 PSOs
  - 2022: 3 PSOs

Most Frequent PSO Specialties Reported on the 2022 PSO Profile

PSO Specialty	Frequency	Percentage
All Medical Specialties	36	58.1%
Other	13	21.0%
Surgery	9	14.5%
Radiology (diagnostic and interventional)	6	9.7%
Anesthesiology	4	6.5%
Neurology	4	6.5%
Physical medicine and rehabilitation	4	6.5%

Source: PSO Privacy Protection Center analysis of 2022 AHRQ PSO Profile data.
Note: Each of the PSO specialties included in this list was identified by a total of four or more PSOs, representing at least 6.5% of the PSOs reporting. This PSO Profile question is a check all that apply question; therefore, the sum of percentages may exceed 100%. Sixty-two PSOs reported specialty focus in the 2022 PSO Profile. A PSO can report more than one specialty focus.

- PSO specialties cover the full spectrum of medical specialties, with about 60% (36/62) of PSOs providing data reporting that they work with all medical specialties. PSOs may report more than one specialty.
- The following PSO specialties are available in the 2022 PSO Profile: Anesthesiology, Cardiology (new for 2022), Dentistry, Dermatology, Emergency Medicine/EMS, Family Medicine, Internal Medicine, Neonatal Care (new for 2022), Neurology, Neurological Surgery, Nuclear Medicine, Nursing, Obstetrics/Gynecology, Ophthalmology, Oral and Maxillofacial Surgery, Oncology, Pathology, Pediatrics, Pharmacology/Pharmacy, Physical Medicine and Rehabilitation, Psychiatry, Pulmonology (new for 2022), Radiology (diagnostic and interventional), Surgery, Urology, and Vascular Surgery.

Types of Providers Contracted With PSOs, by Provider Type, 2018-2021

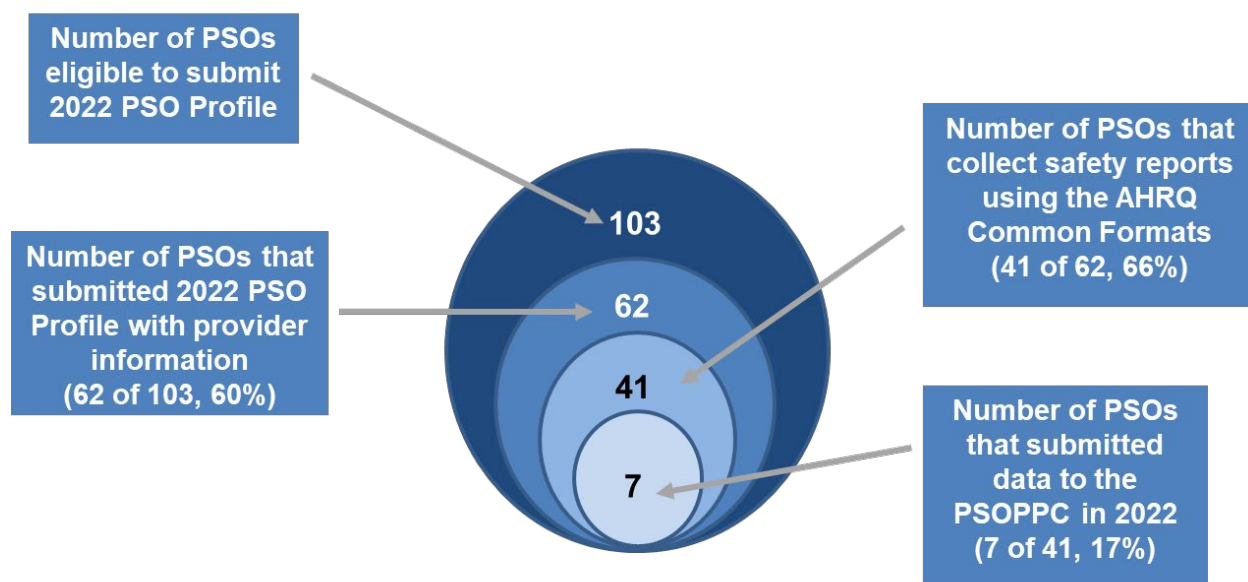| Provider Type	2018 (N = 5,088)	2019 (N = 8,330)	2020 (N = 64,448)	2021 (N = 68,718)	2022 (N=24,276)
General Hospitals	2,001 (39.3%)	2,158 (25.9%)	2,509 (3.9%)	2,810 (4.1%)	2,975 (12.3%)
Specialty Hospitals	520 (10.2%)	523 (6.3%)	664 (1.0%)	111 (0.2%)	152 (0.6%)
Critical Access Hospitals	157 (3.1%)	176 (2.1%)	362 (0.6%)	359 (0.5%)	317 (1.3%)
Licensed Practitioner Groups	1,610 (31.6%)	3,765 (45.2%)	5,948 (9.2%)	6,992 (10.2%)	6,416 (26.4%)
Specialized Treatment Facilities (e.g., Behavioral, Chemotherapy, Dialysis, Psychiatric)	69 (1.4%)	58 (0.7%)	205 (0.3%)	342 (0.5%)	252 (1.0%)
Long-Term Care (Skilled Nursing Facilities or Intermediate/Long-Term Care Facilities, and Assisted Living Facilities)	77 (1.5%)	43 (0.5%)	233 (0.4%)	220 (0.3%)	250 (1.0%)
Retail Pharmacy	15 (0.3%)	2 (0.0%)	5,245 (8.1%)	3,547 (5.2%)	3,554 (14.6%)
Other*	639 (12.6%)	1,605 (19.3%)	49,282 (76.5%)	54,337 (79.1%)	10,360 (42.7%)

* Other includes all categories not specifically identified above (e.g., urgent care/emergency medicine).
Source: PSO Privacy Protection Center analysis of 2022 AHRQ PSO Profile data.
Note: Sixty-two PSOs reported provider type details in the 2022 PSO Profile. Percentages may not add to 100 due to rounding.

- While the PSO program continues to have a strong presence working with hospital providers, the providers contracted with PSOs span a large portion of the continuum of care.
- The trend presents the diversity of the types of providers that are contracted with the PSOs and shows that the patient safety events reported are not limited to those that occur in a hospital setting.
- Changes in the number of providers within each type occur for several reasons, including listing of new PSOs, delisting of PSOs no longer participating in the program, changes in what PSOs voluntarily provide these data, and changes in the composition of provider types among contracted providers.

PSO Data Submission

Number of PSOs eligible to submit 2022 PSO Profile

Number of PSOs that submitted 2022 PSO Profile with provider information (62 of 103, 60%)

Number of PSOs that collect safety reports using the AHRQ Common Formats (41 of 62, 66%)

Number of PSOs that submitted data to the PSOPPC in 2022 (7 of 41, 17%)

103

62

41

7

Source: PSO Privacy Protection Center (PSOPPC) analysis of 2022 AHRQ PSO Profile data.
Note: As of calendar year 2022, the PSOPPC dataset includes data submitted by 17 PSOs across Common Formats for Event Reporting-Hospital V1.1, V1.2, and V2.0.

- Forty-one PSOs have collected data using the AHRQ Common Formats for Event Reporting-Hospital (CFER-H) V1.1, V1.2, and V2.0.
- Seven PSOs submitted data to the PSO Privacy Protection Center (PSOPPC) during calendar year 2022.

Through 2022, only CFER-H-compliant data were submitted to the PSOPPC. Currently, the PSOPPC accepts data that comply with the AHRQ Common Formats for Event Reporting for diagnostic safety (CFER-DS), nursing home (CFER-NH), and community pharmacy (CFER-CP) events.

Although only a small percentage of PSOs submit the data to the PSOPPC using the CFER-H specifications, 66% of PSOs collect patient safety reports. These data indicate that opportunities remain to improve the collection and reporting of patient safety data in hospitals and other settings.

Network of Patient Safety Databases and the National Learning System

The Patient Safety and Quality Improvement Act of 2005: A National Learning System

- The Network of Patient Safety Databases (NPSD) is part of the national learning system of providers, AHRQ-listed PSOs, and providers (see figure below). It serves as a learning system for the public.
- The data collected by the PSOPPC are designed to support measurement and improvement of patient safety in hospitals.
- Once data are collected, aggregated, deidentified, and submitted to the NPSD, they can provide insights about improvements in patient care, which in turn can advance patient safety. More information is available on AHRQ's website at https://www.ahrq.gov/npsd/ quality-patient-safety/index.html.

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Appendix: Data Methods and Analysis

Data Preparation

- Metrics were aligned so that a lower rate is "better" (i.e., lower rate implies a healthier status).
- Measures were categorized by NHQDR dimension, NHQDR priority area, and setting.
- Reference groups were determined as noted below.

Variable	Reference Group
Age	18-44 years
Gender	Male
Race/Ethnicity	Non-Hispanic White
Income	400% or more of poverty guideline
Education	Any college education
Metropolitan status	Large fringe metropolitan (suburb) or metropolitan (urban)
Insurance	Any private insurance
Disability status	Adults without any disability

Methods: Trends

To determine quality, change of measure trends over time was assessed for at least four time points between 2000 and the most recent year. Meaningful differences between two groups were determined based on two criteria:

- Magnitude of change
- Statistical significance

Average annual percentage change was estimated using unweighted log-linear regression to be more consistent with Centers for Medicare & Medicaid Services methods. This approach differs from previous chartbooks, which used weighted log-linear regression.

Interpretation of Trends

Measures are interpreted in three categories:

- **Improving** = Average annual percentage change >1% per year in a favorable direction and $p<0.10$.
- **Not Changing** = Average annual percentage change ≤1% per year or $p ≥0.10$.
- **Worsening** = Average annual percentage change >1% per year in an unfavorable direction and $p<0.10$.

Measures that are not changing over time are not necessarily performing well. Each measure's performance requires further exploration of the data.

Methods: Size of Disparities

The NHQDR also assesses whether access or quality differs between two subpopulations for the most recent data year. Comparisons are typically made between a priority population group and a reference group within a population characteristic (e.g., Blacks vs. Whites within the race characteristic). The best performing subgroup is typically used as the reference group.

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

- The absolute difference between the priority population group and the reference group must be statistically significant with $p < 0.05$ on a two-tailed test.
- The relative difference between the priority population group and the reference group must be at least 10% when framed positively or negatively ($[p1 - p2]/p2 > 0.1$), where p1 is priority group's aligned rate and p2 is reference group's aligned rate.

Interpretation of Size of Disparities

Measures are interpreted in three categories:

- **Better** = Priority population estimate more favorable than reference group estimate by at least 10% and $p < 0.05$.
- **Same** = Priority population and reference group estimates differ by less than 10% or $p \geq 0.05$.
- **Worse** = Priority population estimate less favorable than reference group estimate by at least 10% and $p < 0.05$.

Measures that are performing the same do not necessarily indicate that those measures are performing well. Each measure's performance requires further exploration of the data.

Methods: Trends in Disparities Between Two Subpopulations

The NHQDR also observes whether the difference in access or quality between two subpopulations has changed over time. Meaningful differences between two groups are determined based on two criteria:

- Estimates for at least four time points between 2000 and the most recent data year for both the priority population and reference group are used to calculate the trend.
- **Model:** $M = \beta_0 + \beta_1 Y_1$ where M is the aligned rate of a subgroup, β_0 is the intercept or constant, and β_1 is the coefficient corresponding to year Y. The coefficient is the average annual change (AAC). We calculate the difference in the AAC and in the standard error values between the priority population group and reference group.
- We use standard errors from the regression coefficients to calculate the standard error of the absolute difference.

Interpretation of Trends in Disparities Between Two Subpopulations

Measures are interpreted in three categories:

- **Improving** = The difference in the AAC of the priority population and reference group is < -1 (in a favorable direction) and p <0.10 for testing that regression coefficients are the same.
- **Not Changing** = Absolute value of the difference in the AAC of the priority population and reference group is <1 or the absolute value of the difference in the AAC of the priority population and reference group is >1 and p ≥0.10 for testing that regression coefficients are the same.
- **Worsening** = The difference in the AAC of the priority population and reference group is >1 (in an unfavorable direction) and p <0.10 for testing that regression coefficients are the same.

Measures that are not changing are not necessarily performing well. Each measure's performance requires further exploration of the data.