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Breast Reconstruction Surgery for Mastectomy in Hospital Inpatient and Ambulatory Settings, 2009–2014

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Introduction

After a mastectomy (surgical removal of the breast), a woman faces a complex and emotional decision about whether to have breast reconstruction or live without a breast or breasts. There are usually three main considerations in the decision: medical, sexual, and physical. Medical considerations include concerns that breast reconstruction surgery lengthens recovery time and increases the chance for infection and other postoperative complications. Sexual considerations involve the impact of the mastectomy on future sexual encounters. Physical features include how breasts may define femininity and sense of self.[1]

Several previous studies have shown an increase in breast reconstruction for mastectomy.[2,3,4] One study used a 2007 national surgical database, another study used 2008 claims-based data of women insured through large private employers, and a third study used the Nationwide Inpatient Sample (NIS) for 2005–2011,[5,6,7] part of the Healthcare Cost and Utilization Project (HCUP)

This HCUP Statistical Brief presents data on reconstruction surgeries for mastectomy among adult women over a 5-year time period from 2009 through 2014, overall and by patient and hospital characteristics. Reconstructions are examined across two hospital settings: hospital inpatient and hospital-based ambulatory surgery.

Highlights

- From 2009 to 2014, in 22 States, the population rate of breast reconstruction for mastectomy increased by 62 percent, from 21.7 to 35.1 per 100,000 women aged 18 years or older.
- Increases occurred for all age groups, but disproportionately so for women aged 65 years and older, those covered by Medicare, and those who were uninsured.
- In 2014, women who lived in rural areas had fewer reconstructions (29 per 100 mastectomies) compared with urban-dwelling women (41 reconstructions per 100 mastectomies).
- Growth in breast reconstructive surgery was primarily attributable to the following factors:
  - Ambulatory surgeries increased more than 150 percent. Inpatient reconstructions were stable.
  - Reconstructions performed at a separate stay or visit following mastectomy, which constituted 61 percent of reconstructions in 2009 and grew to 71 percent in 2014.
- Compared with White and Hispanic women, Black women were more likely to receive breast reconstruction surgery as an inpatient procedure and with simultaneous mastectomy.

[1] Weiss MC. Choosing Between Reconstruction and "Going Flat" After Breast Cancer. US News and World Report. December 13, 2016. http://health.usnews.com/health-care/for-better/articles/2016-12-13/choosing-between-reconstruction-and-going-flat-after-breast-cancer. Accessed April 18, 2017.
[2] Lucas DJ, Sabino J, Shriver CD, Pawlik TM, Singh DP, Vertrees AE. Doing more: trends in breast cancer surgery, 2005 to 2011. American Surgeon. 2015;81(1):74–80.
[3] Jagsi R, Jiang J, Momoh AO, Alderman A, Giordano SH, Buchholz TA, et al. Trends and variation in use of breast reconstruction in patients with breast cancer undergoing mastectomy in the United States. Journal of Clinical Oncology. 2014;32(9):919–26.
[4] Wexelman B, Schwartz JA, Lee D, Estabrook A, Thu Ma AM. Socioeconomic and geographic differences in immediate reconstruction after mastectomy in the United States. 2014;20(4):339–46.
[5] Lucas DJ et al., 2015. Op. cit.
[6] Jagsi R et al., 2014. Op. cit.
[7] Wexelman B et al., 2014. Op. cit.

Reconstructions that occurred during the same surgical stay or visit as the mastectomy are examined separately from those that occurred during another stay or visit following the mastectomy. The total number of mastectomies in each year is also presented for reference. Reconstructive surgeries are examined as a rate per 100,000 adult females in the population and as a ratio relative to the total number of mastectomies in the calendar year in these data.

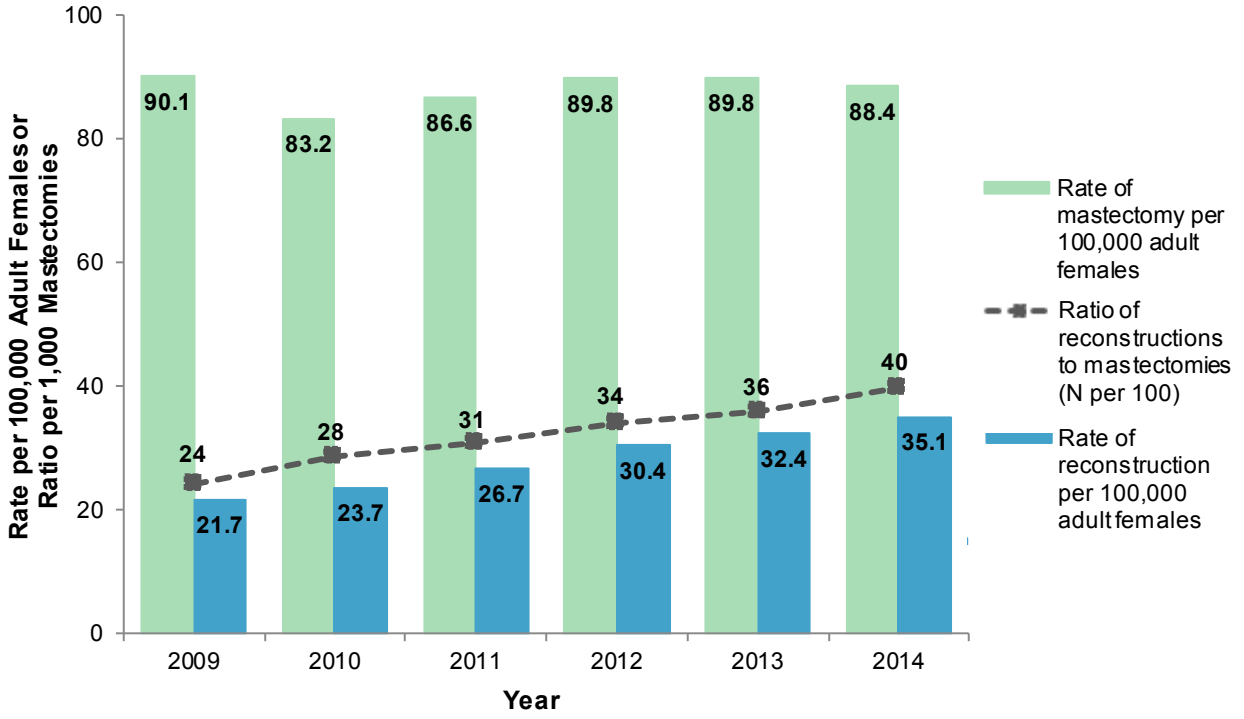
For women who had breast reconstruction at a separate stay or visit following their mastectomy, we use the denominator of mastectomies for that calendar year, although the mastectomy may have occurred in previous years. This approach provides a stable denominator for both simultaneous and nonsimultaneous breast reconstructions for each calendar year.

The analysis is limited to hospitals and ambulatory surgery centers within 22 States—representing 59 percent of the U.S. population—for which reconstructions and mastectomies could be identified in both the inpatient and ambulatory surgery settings. All differences between estimates noted in the text are at least 10 percent.

Findings

Trends in breast reconstructive surgeries for mastectomy, 2009–2014
Figure 1 displays the rate of mastectomy (unilateral and bilateral combined) and the rate of reconstructive surgery for mastectomy per 100,000 females in the population aged 18 years or older from 2009 through 2014. Inpatient and ambulatory surgeries are combined. The ratio of reconstructions to mastectomies also is shown. A higher ratio in one year, compared with another suggests that a greater number of women who underwent mastectomy had reconstructive surgery, regardless of whether the mastectomy was in the same year.

Figure 1. Rates of mastectomy and breast reconstructive surgery for mastectomy, 2009–2014



Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Ambulatory Surgery and Services Databases (SASD) from 22 States, 2009–2014

- **There was a 62 percent increase in the population rate of breast reconstruction for mastectomy from 2009 to 2014.**

  For these 22 States, there were 21.7 breast reconstructions per 100,000 women in 2009. The rate steadily increased to 35.1 per 100,000 in 2014, a 62 percent increase over this 6-year period.

- **There was a 67 percent increase in the ratio of breast reconstructions to mastectomies between 2009 and 2014.**

  In 2009, for every 100 mastectomies there were 24 breast reconstructions performed. This increased to 40 breast reconstructions per 100 mastectomies in 2014, a 67 percent increase.

- **The trend in the rate of mastectomy surgeries between 2009 and 2014 remained relatively stable.**

  The rate of mastectomy varied less than 10 percent over this time period, from a low of 83.2 per 100,000 women to a high of 90.1 per 100,000 women.

Table 1 presents the ratio of breast reconstructions to mastectomies in 2009 and 2014, by patient and hospital characteristics. Inpatient and ambulatory surgeries are combined. The rate of mastectomy and the rate of breast reconstructive surgery for mastectomy per 100,000 females aged 18 years or older also are presented where population data are available. The population-based rates are presented for reference but are not discussed because they reflect rates of both cancer and mastectomy.

Table 1. Rates of mastectomy and reconstruction, ratio of all reconstructive surgeries to all mastectomies, and percent change, by patient and hospital characteristics, 2009 and 2014

Characteristic	Rate of mastectomy per 100,000 adult females		Rate of reconstruction per 100,000 adult females		Ratio of all reconstructive surgeries to all mastectomies, N per 100		Percent change in ratio, 2009–2014
	2009	2014	2009	2014	2009	2014	
Total	90.1	88.4	21.7	35.1	24	40	65
Patient characteristic							
Age, years							
18–34	8.9	11.6	3.1	5.6	35	48	37
35–44	65.3	75.1	24.4	41.2	37	55	47
45–54	119.9	122.8	44.2	70.4	37	57	56
55–64	143.8	130.0	38.7	55.1	27	42	57
65+	163.4	142.5	11.7	24.3	7	17	140
Community income quartile							
Quartile 1 (poorest)	78.1	77.4	13.3	22.9	17	30	74
Quartile 2	84.0	82.7	17.4	29.3	21	35	71
Quartile 3	88.8	89.4	22.0	37.2	25	42	68
Quartile 4 (wealthiest)	101.5	98.4	31.5	48.2	31	49	58
Patient residence							
Urban	89.5	88.0	22.6	36.2	25	41	63
Rural	92.0	90.3	15.9	26.5	17	29	70
Expected payer[a]							
Medicare	—[b]	—[b]	—[b]	—[b]	8	19	130
Medicaid	—[b]	—[b]	—[b]	—[b]	19	37	91
Private	—[b]	—[b]	—[b]	—[b]	35	52	51
Uninsured	—[b]	—[b]	—[b]	—[b]	21	44	104
Hospital characteristic							
Hospital location							
Urban	—[b]	—[b]	—[b]	—[b]	25	41	62
Rural	—[b]	—[b]	—[b]	—[b]	6	12	99
Teaching status							
Nonteaching	—[b]	—[b]	—[b]	—[b]	20	26	26
Teaching	—[b]	—[b]	—[b]	—[b]	27	45	65

[a] Other payers are not shown.

[b] Population denominator data were unavailable to calculate rate. The ratio is calculated from the number of reconstructions and mastectomies.

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Ambulatory Surgery and Services Databases (SASD) from 22 States, 2009 and 2014

- **Women aged 35–44 and 45–54 years had the largest number of reconstructions for mastectomy, but the fastest growth in reconstructive surgery was for women aged 65 years and older.**

  In 2009, women aged 35–44 years had 37 reconstructive surgeries per 100 mastectomies. This ratio increased to 55 in 2014, a 47 percent increase over this 6-year period. Similarly, women aged 45–54 years had 37 reconstructive surgeries in 2009 and 57 in 2014, a 56 percent increase.

  Although women aged 65 years and older had a lower ratio of reconstructions to mastectomies in 2009 and 2014, they experienced the fastest growth in reconstructions. In 2009, among women aged 65 years and older, seven reconstructions were performed for every 100 mastectomies. This increased to 17 reconstructions per 100 mastectomies in 2014, a 140 percent increase.

- **Women in the highest quartile of community income had the most breast reconstructive surgeries relative to mastectomies, but the fastest growth in reconstructive surgery was for women in the lowest community income quartile.**

  In 2009, women in the highest quartile of community income had 31 reconstructive surgeries per 100 mastectomies, increasing to 49 in 2014, a 58 percent increase over this 6-year period.

  Even though women in the lowest quartile of community income had fewer reconstructions (i.e., a lower ratio of reconstructions to mastectomies) in 2009 and 2014, they experienced the fastest growth in reconstructions. In 2009, there were 17 reconstructions for every 100 mastectomies for women in the lowest income quartile. This increased to 30 reconstructions for every 100 mastectomies in 2014, a 74 percent increase.

- **Women residing in rural areas had a lower rate of reconstructions relative to mastectomies than did women in urban areas in both 2009 and 2014.**

  Women residing in rural areas had 17 reconstructive surgeries for every 100 mastectomies in 2009 and 29 in 2014. In comparison, women residing in urban areas had 25 reconstructions per 100 mastectomies in 2009 and 41 in 2014.

  Similarly, urban hospitals performed more reconstructions than did rural hospitals in both time periods. The number of reconstructions for every 100 mastectomies performed in rural hospitals increased from 6 in 2009 to 12 in 2014. In comparison, the number of reconstructions for every 100 mastectomies performed in urban hospitals increased from 25 in 2009 to 41 in 2014.

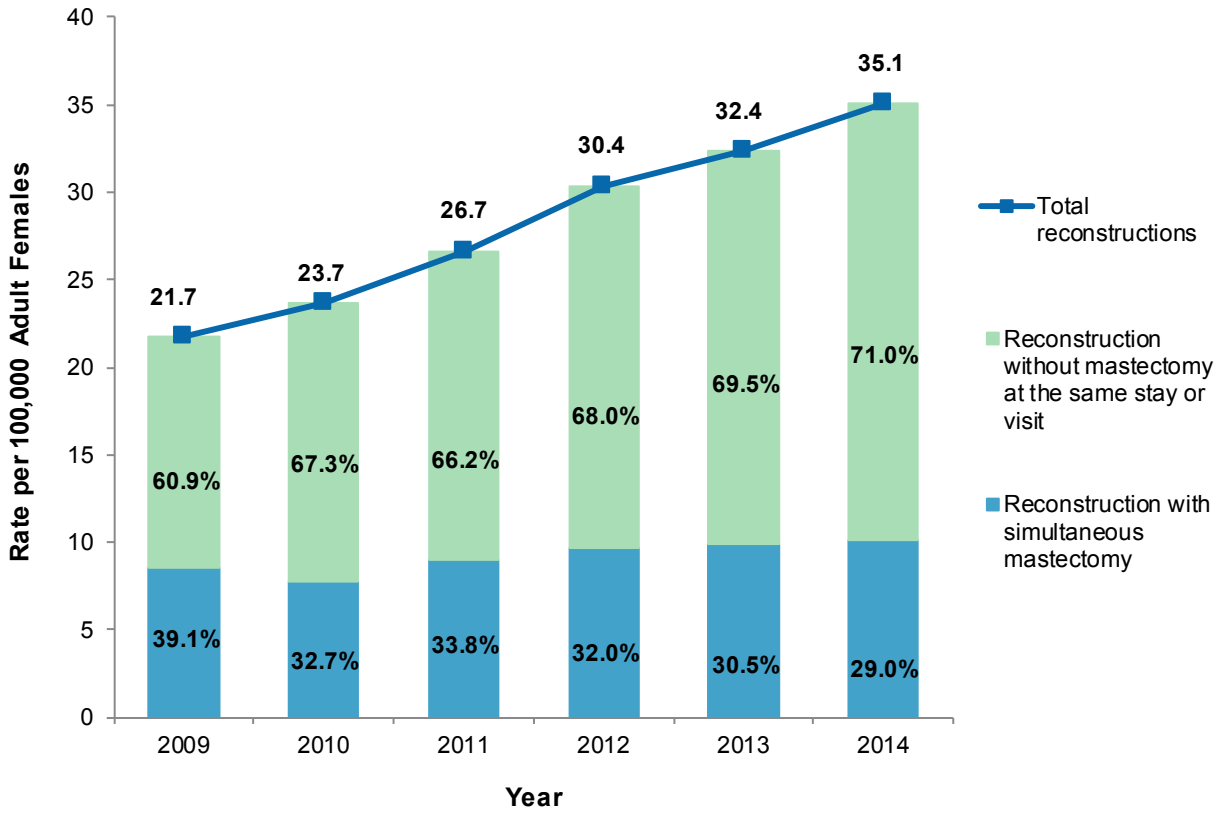
- **Compared with 2009, twice as many women with no insurance and twice as many women covered by Medicare received breast reconstruction for mastectomy in 2014.**

  The ratio of breast reconstruction to mastectomy for women with Medicare was 8 in 2009 and 19 in 2014, a 130 percent increase. The ratio of breast reconstruction to mastectomy for women without insurance more than doubled—from 21 per 100 mastectomies in 2009 to 44 in 2014, a 104 percent increase.

  Women covered by Medicaid or private insurance also saw increases in breast reconstruction, though to a lesser extent. Among Medicaid-covered women there was a 91 percent increase, from 19 reconstructions per 100 mastectomies in 2009 to 37 in 2014. Women with private insurance had the highest rates of reconstructions in both time periods, increasing 51 percent from 35 reconstructions per 100 mastectomies in 2009 to 52 in 2014.

Figure 2 displays the rate of breast reconstructive surgery for mastectomy per 100,000 females aged 18 years or older from 2009 through 2014 and shows whether the breast reconstruction was performed at the same stay or visit as the mastectomy. Inpatient and ambulatory surgeries are combined.

Figure 2. Rate of reconstructive surgery for mastectomy and the percentage performed at the same stay or visit as the mastectomy, 2009–2014



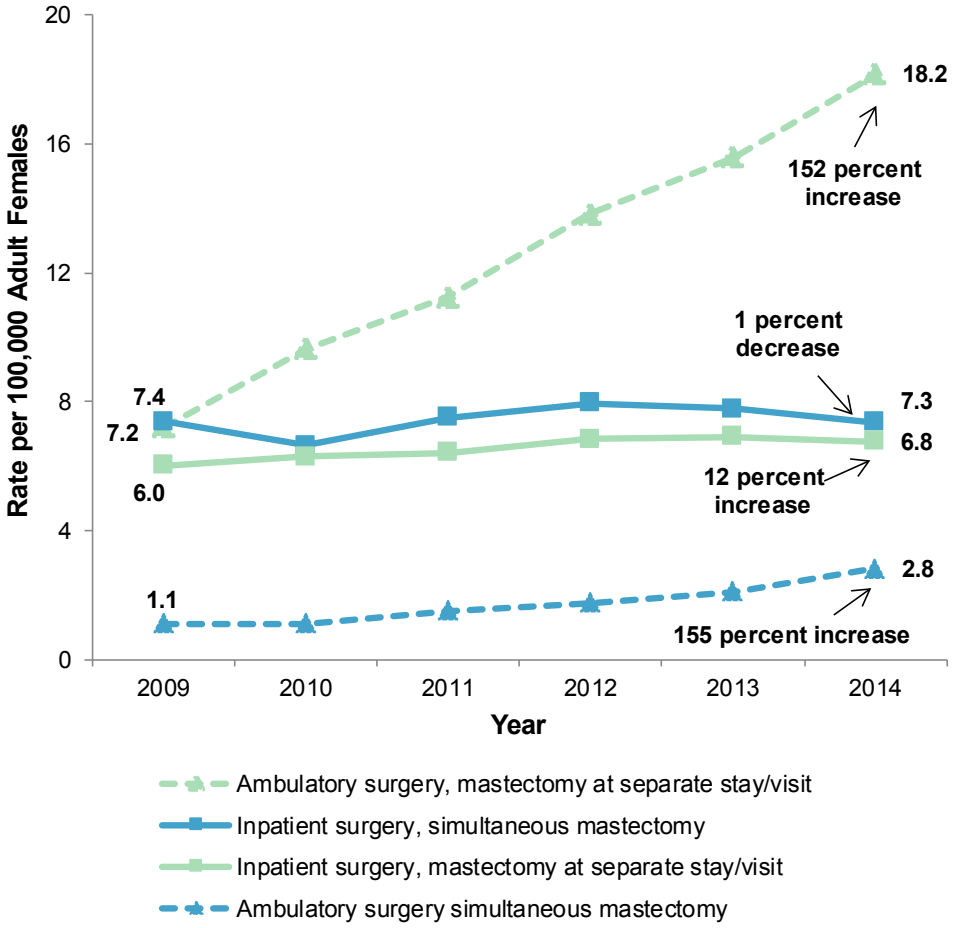
Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Ambulatory Surgery and Services Databases (SASD) from 22 States, 2009–2014

- **The growth in reconstructive surgeries from 2009 through 2014 was due to growth in breast reconstructions performed after mastectomy at a separate stay or visit.**

  In 2009, among women receiving reconstruction, 39.1 percent received simultaneous mastectomy and reconstruction while 60.9 percent received breast reconstruction without mastectomy at the same time. By 2014, only 29.0 percent received simultaneous reconstruction and the percentage receiving reconstruction separately from mastectomy increased to 71.0 percent. The growth in total reconstructions over this time period was entirely due to nonsimultaneous reconstructions.

Figure 3 examines the population rate of breast reconstructions in the inpatient and ambulatory surgery settings from 2009 to 2014.

Figure 3. Population rate of reconstructive surgery for mastectomy, by surgical setting and whether the reconstruction was performed at the same stay or visit as the mastectomy, 2009–2014



Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Ambulatory Surgery and Services Databases (SASD) from 22 States, 2009–2014

- **Most of the growth in breast reconstructive surgery was in the ambulatory surgery setting.**

  In the ambulatory surgery setting, there was a 152 percent increase in the rate of breast reconstruction performed after a mastectomy at a separate visit between 2009 and 2014; the rate increased from 7.2 to 18.2 per 100,000 women.

  Although the rate was lower than that of breast reconstruction performed at a separate visit in the ambulatory surgery setting, there was also a 155 percent increase in the rate of breast reconstruction with simultaneous mastectomy in the ambulatory surgery setting between 2009 and 2014. The rate increased from 1.1 per 100,000 women in 2009 to 2.8 per 100,000 women in 2014.

- **There was minimal to no growth in rates of inpatient breast reconstructive surgery between 2009 and 2004.**

  In the inpatient setting, there was only a 12 percent increase in the rate of breast reconstruction following a mastectomy at a separate stay between 2009 and 2014; the rate increased slightly from 6.0 per 100,000 women in 2009 to 6.8 per 100,000 in 2014.

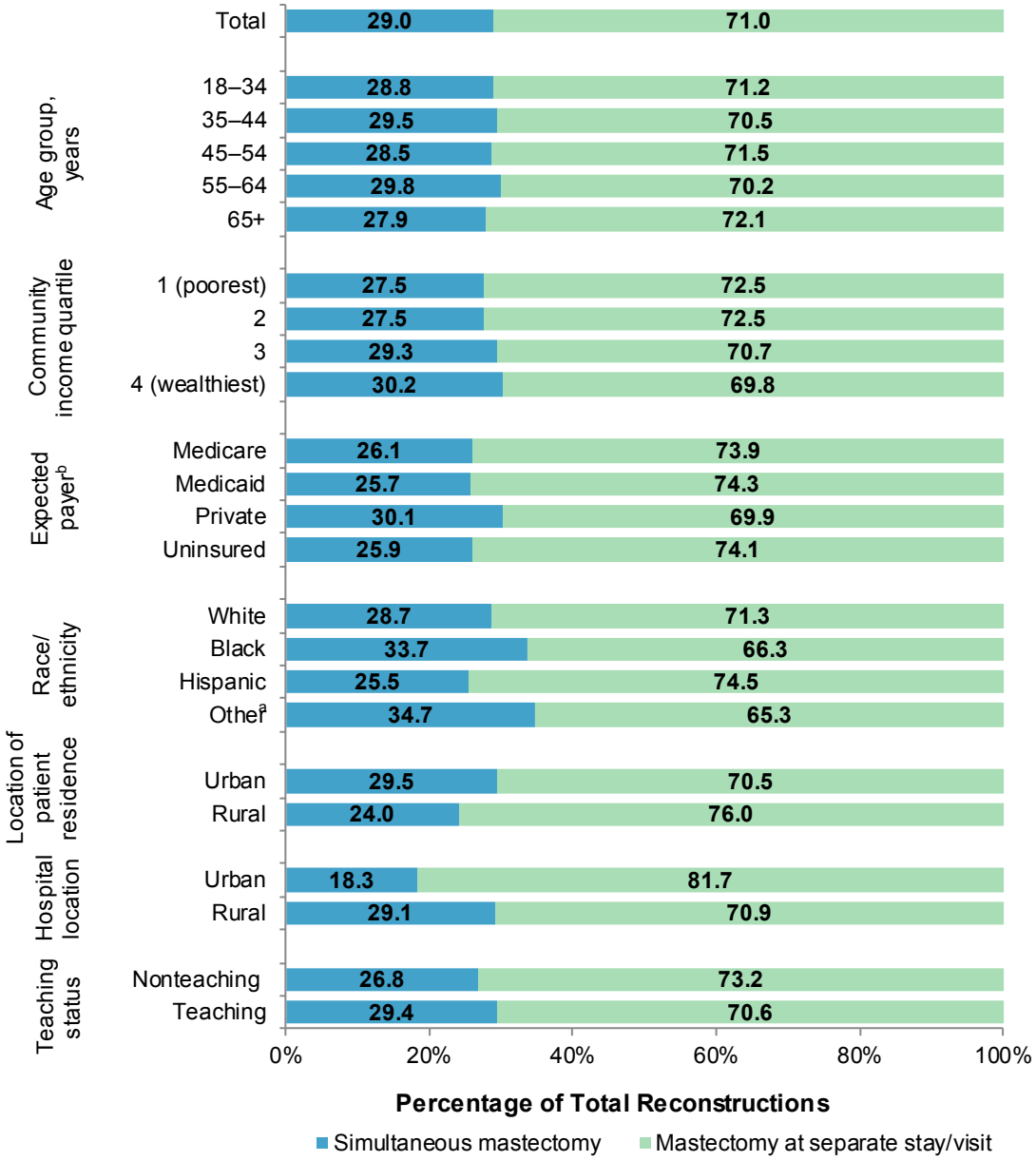
  There was no change in the rate of breast reconstruction with simultaneous mastectomy in the inpatient setting between 2009 and 2014 (7.4 per 100,000 women in 2009 and 7.3 per 100,000 in 2014).

- **Breast reconstruction with simultaneous mastectomy is primarily an inpatient procedure, whereas breast reconstruction without simultaneous mastectomy is primarily performed on an outpatient basis.**

  In 2014, the rate of inpatient reconstruction was 6.8 per 100,000 women without a simultaneous mastectomy and 7.3 per 100,000 women for simultaneous mastectomy. In contrast, in 2014 the rate of outpatient reconstruction was 18.2 per 100,000 women without a simultaneous mastectomy compared with 2.8 per 100,000 women for simultaneous mastectomy. Thus, 87 percent of all nonsimultaneous reconstructions are performed on an outpatient basis.

Patient and hospital characteristics of breast reconstructive surgeries for mastectomy, 2014
Figure 4 displays patient and hospital characteristics for reconstructive surgeries (simultaneous and subsequent) across all settings in 2014.

Figure 4. Percentage of reconstructions performed at the same or a different encounter as the mastectomy, by patient and hospital characteristics, 2014



[a] Other races/ethnicities include non-Hispanic Asian/Pacific Islanders, Native Americans/Alaska Natives, and other races/ethnicities.

[b] Other payers are not shown.

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Ambulatory Surgery and Services Databases (SASD) from 22 States, 2014

- **In 2014, across the 22 States included in this study, fewer than one-third of women received breast reconstruction with simultaneous mastectomy.**

  In 2014, 71 percent of women had breast reconstructive surgery at a separate stay or visit as the mastectomy and 29 percent had breast reconstruction with a simultaneous mastectomy.

- **Black women were more likely to receive breast reconstruction with simultaneous mastectomy, compared with Hispanic women.**

  In 2014, 33.7 percent of Black women received breast reconstruction with simultaneous mastectomy, compared with 25.5 percent of Hispanic women.

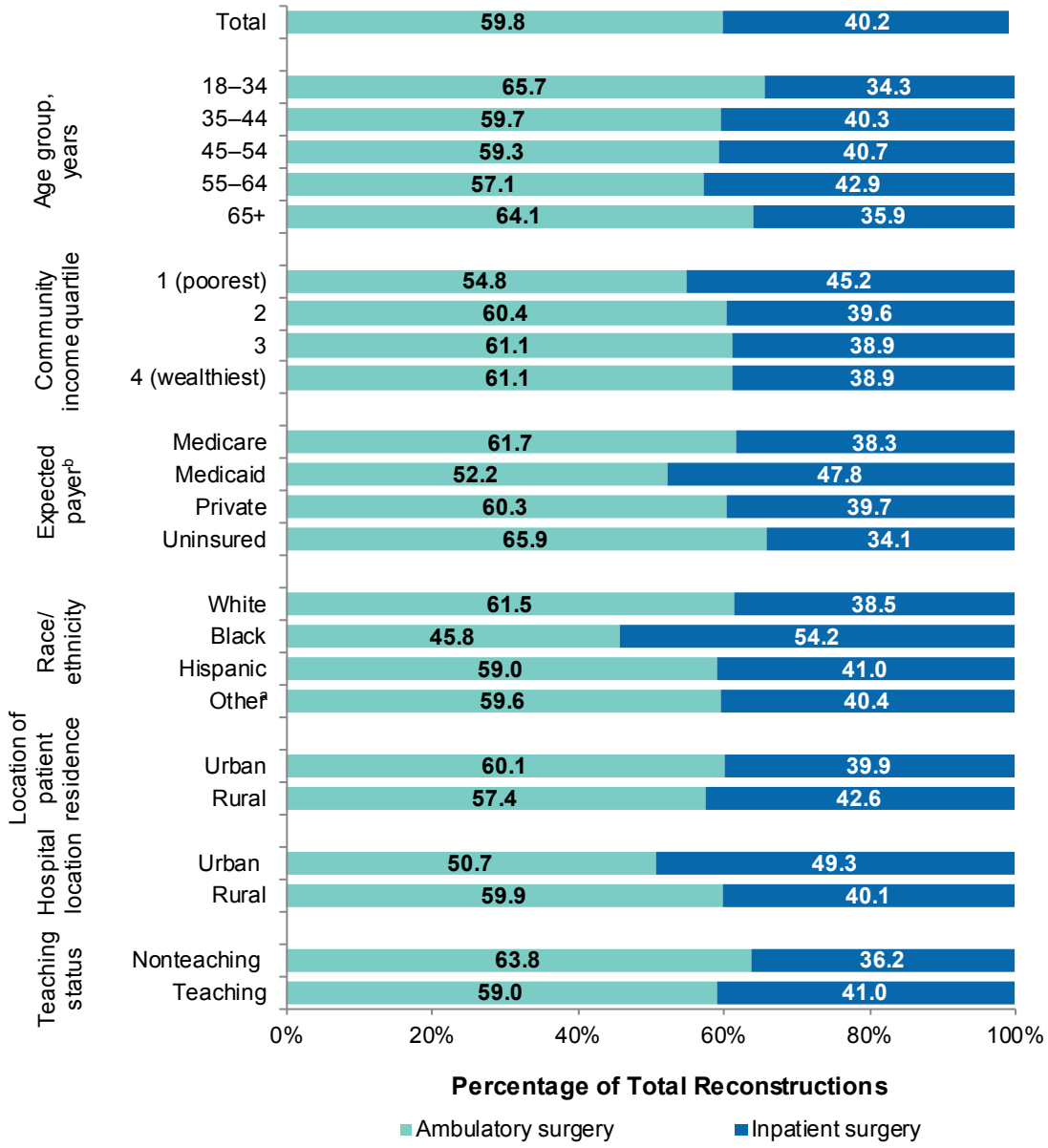
- **Women treated in rural hospitals were 59 percent more likely than women treated in urban hospitals to have a breast reconstruction with simultaneous mastectomy.**

  Of women treated in rural hospitals, 29.1 percent had breast reconstruction with simultaneous mastectomy compared with 18.3 percent of women treated in an urban hospital.

  There was not a substantial difference across age groups, community income quartiles, patient residence, expected payer, or teaching status in the percentage of women who had breast reconstructive surgery with simultaneous mastectomy versus mastectomy at a separate stay or visit.

Figure 5 displays patient and hospital characteristics for reconstructions across ambulatory surgery and inpatient settings in 2014. Those with a simultaneous and nonsimultaneous mastectomy are combined.

Figure 5. Percentage of reconstructions performed as ambulatory or inpatient surgeries, by patient and hospital characteristics, 2014



[a] Other races/ethnicities include non-Hispanic Asian/Pacific Islanders, Native Americans/Alaska Natives, and other races/ethnicities.

[b] Other payers are not shown.

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) and State Ambulatory Surgery and Services Databases (SASD) from 22 States, 2014

- **In 2014, across the 22 States included in this study, the majority of women received breast reconstruction in an ambulatory setting.**

  Most breast reconstruction was performed in an ambulatory setting—59.8 percent of women had breast reconstructive surgery in an ambulatory setting, and the remaining 40.2 percent had breast reconstruction in an inpatient hospital setting.

- **Women aged 18–34 years and those aged 65 years and older were more likely than those in the other three age groups to receive breast reconstruction surgeries in an ambulatory setting.**

  Among women 18–34 years of age with breast reconstructive surgery, 65.7 percent were performed in an ambulatory surgery setting. Similarly, for women aged 65 years and older, 64.1 percent of reconstructions were performed outpatient. Among women aged 35–64 years undergoing reconstruction, less than 60 percent were ambulatory surgeries.

- **Women in the wealthiest communities were more likely to receive breast reconstructive surgery in an ambulatory setting compared with women in the poorest communities.**

  In 2014, 61.1 percent of women in the wealthiest communities (income quartiles 3 and 4) had breast reconstruction as an ambulatory surgery compared with 54.8 percent of women in the poorest communities (income quartile 1).

- **Women who had Medicaid as their primary payer were less likely to receive breast reconstruction as an ambulatory surgery compared with women with no insurance and those covered by Medicare or private insurance.**

  Among women covered by Medicaid, 52.2 percent had reconstructive surgery in an ambulatory setting compared with 60.3 percent of women with private insurance, 61.7 percent with Medicare, and 65.9 of those with no insurance.

- **Black women were less likely to receive breast reconstructive surgery in an ambulatory setting, compared with Hispanic and White women.**

  Only 45.8 percent of Black women received breast reconstruction as an ambulatory surgery—29 percent less likely than Hispanic women (59.0 percent of whom received ambulatory reconstruction) and 34 percent less likely than White women (61.5 percent of whom received ambulatory reconstruction).

- **Women who were treated in rural hospitals were more likely to receive breast reconstruction as an ambulatory surgery compared with women treated in urban hospitals.**

  Sixty percent of women treated in rural hospitals received breast reconstruction as an ambulatory surgery compared with 50.7 percent of women treated in an urban hospital.

  There were no differences by location of patient residence or hospital teaching status in the percentage of breast reconstructive surgeries performed in the ambulatory setting versus the inpatient setting.

About Statistical Briefs

HCUP Statistical Briefs provide basic descriptive statistics on a variety of topics using HCUP administrative health care data. Topics include hospital inpatient, ambulatory surgery, and emergency department use and costs, quality of care, access to care, medical conditions, procedures, and patient populations, among other topics. The reports are intended to generate hypotheses that can be further explored in other research; the reports are not designed to answer in-depth research questions using multivariate methods.

Data Source

The volumes and rates in this Statistical Brief are based upon data from the Healthcare Cost and Utilization Project (HCUP) 2009–2014 State Inpatient Databases (SID) and State Ambulatory Surgery and Services Databases (SASD). This report evaluates inpatient and outpatient procedure data from 22 States that contributed to the 2009–2014 SID and SASD: California, Colorado, Connecticut, Florida, Georgia, Iowa, Indiana, Maryland, Michigan, Minnesota, Missouri, Nebraska, New Jersey, New York, North Carolina, Ohio, South Carolina, South Dakota, Tennessee, Utah, Vermont, and Wisconsin. Analysis was limited to hospitals within the 22 States that had cases in the inpatient and ambulatory surgery settings in each data year and for which reconstructions and mastectomies could be identified by International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) procedure codes; by Current Procedural Terminology (CPT®) procedure codes; or by both.

Supplemental sources included population denominator data for use with HCUP databases, derived from information available from Claritas.[8]

Definitions

Diagnoses, procedures, ICD-9-CM, and Current Procedural Terminology (CPT®)
The *principal diagnosis* is that condition established after study to be chiefly responsible for the patient's admission to the hospital. *Secondary diagnoses* are concomitant conditions that coexist at the time of admission or develop during the stay. *All-listed diagnoses* include the principal diagnosis plus these additional secondary conditions.

All-listed procedures include all procedures performed during the hospital stay, whether for definitive treatment or for diagnostic or exploratory purposes.

ICD-9-CM is the International Classification of Diseases, Ninth Revision, Clinical Modification, which assigns numeric codes to diagnoses and procedures. There are approximately 14,000 ICD-9-CM diagnosis codes. There are approximately 4,000 ICD-9-CM procedure codes.

CPT assigns numeric codes to procedures. There are approximately 9,600 CPT procedure codes.

Procedures on inpatient hospitalization records are coded using the ICD-9-CM; procedures on ambulatory surgery and services records can be coded using either the ICD-9-CM or the CPT.

[8] Claritas. Claritas Demographic Profile. www.claritas.com. Accessed June 26, 2017.

Case definition
The ICD-9-CM and CPT procedure codes defining mastectomies are shown in Table 2.

Table 2. ICD-9-CM and CPT procedure codes defining mastectomies

Code	Description
ICD-9-CM procedure codes	
8535	Bilateral subcutaneous mammectomy with synchronous implant
8536	Other bilateral subcutaneous mammectomy
8542	Bilateral simple mastectomy
8544	Bilateral extended simple mastectomy
8546	Bilateral radical mastectomy
8548	Bilateral extended radical mastectomy
8533	Unilateral subcutaneous mammectomy with synchronous implant
8534	Other unilateral subcutaneous mammectomy
8541	Unilateral simple mastectomy
8543	Unilateral extended simple mastectomy
8545	Unilateral radical mastectomy
8547	Unilateral extended radical mastectomy
CPT procedure codes	
19303	Mastectomy, simple complete
19304	Mastectomy, subcutaneous
19305	Mastectomy, radical
19306	Mastectomy, radical, urban type
19307	Mastectomy, modified radical

Abbreviations: CPT, Current Procedural Terminology; ICD-9-CM, International Classification of Diseases, Ninth Revision, Clinical Modification

The codes used to define reconstructive surgeries for mastectomy are shown in Table 3. We did not verify that reconstruction occurred after mastectomy by linking records across patients. However, we can assume that all women included did have a mastectomy because we included codes for total breast reconstruction. These procedures would be done following a mastectomy but not following a lumpectomy or for cosmetic reasons unrelated to cancer, which would entail only a partial reconstruction. We also included select codes for partial reconstructions that were unique to ambulatory surgery records, if a code for total breast reconstruction was not present but a diagnosis of V510, *Encounter for breast reconstruction following mastectomy*, was present in any position.

Table 3. ICD-9-CM and CPT procedure codes defining reconstructions for mastectomies

Code	Description
ICD-9-CM procedure codes	
8570	Total reconstruction of breast, not otherwise specified
8571	Latissimus dorsi myocutaneous flap
8572	Transverse rectus abdominis myocutaneous (TRAM) flap, pedicled
8573	Transverse rectus abdominis myocutaneous (TRAM) flap, free
8574	Deep inferior epigastric artery perforator (DIEP) flap, free
8575	Superficial inferior epigastric artery (SIEA) flap, free
8576	Gluteal artery perforator (GAP) flap, free
8579	Other total reconstruction of breast
CPT procedure codes, if a mastectomy code in Table 2 was found on the record	
19361	Breast reconstruction with latissimus dorsi flap, without prosthetic implant
19364	Breast reconstruction with free flap
19366	Breast reconstruction with other technique
19367	Breast reconstruction with TRAM, single pedicle, including closure of donor site
19368	Breast reconstruction with TRAM, single pedicle, including closure of donor site; with microvascular anastomosis (supercharging)
19369	Breast reconstruction with TRAM, double pedicle, including closure of donor site
19340	Immediate insertion of breast prosthesis following mastopexy, mastectomy or in reconstruction
CPT procedure codes, if a mastectomy code in Table 2 was NOT found on the record	
19361	Breast reconstruction with latissimus dorsi flap, without prosthetic implant
19364	Breast reconstruction with free flap
19366	Breast reconstruction with other technique
19367	Breast reconstruction with TRAM, single pedicle, including closure of donor site
19368	Breast reconstruction with TRAM, single pedicle, including closure of donor site; with microvascular anastomosis (supercharging)
19369	Breast reconstruction with TRAM, double pedicle, including closure of donor site
11970[a]	Replacement of tissue expander with permanent prosthesis
19340[a]	Immediate insertion of breast prosthesis following mastopexy, mastectomy or in reconstruction
19342[a]	Delayed insertion of breast prosthesis following mastopexy, mastectomy or in reconstruction

Abbreviation: CPT, Current Procedural Terminology; ICD-9-CM, International Classification of Diseases, Ninth Revision, Clinical Modification

[a] If any of these three CPT codes were found on the record (without a CPT in the range 1936n), then the record was only counted as having reconstruction for mastectomy if there was also a diagnosis of V510, *Encounter for breast reconstruction following mastectomy*, in any position.

Types of hospitals included in HCUP State Inpatient Databases

This analysis used State Inpatient Databases (SID) limited to data from community hospitals, which are defined as short-term, non-Federal, general, and other hospitals, excluding hospital units of other institutions (e.g., prisons). Community hospitals include obstetrics and gynecology, otolaryngology, orthopedic, cancer, pediatric, public, and academic medical hospitals. Excluded for this analysis are long-term care facilities such as rehabilitation, psychiatric, and alcoholism and chemical dependency hospitals. However, if a patient received long-term care, rehabilitation, or treatment for a psychiatric or chemical dependency condition in a community hospital, the discharge record for that stay was included in the analysis.

Types of hospitals included in HCUP State Ambulatory Surgery and Services Databases

This analysis used State Ambulatory Surgery and Services Databases (SASD) limited to data from hospital-owned ambulatory surgery facilities. Although some SASD include data from facilities not owned by a hospital, those facilities were excluded from this analysis. The designation of a facility as hospital-

owned is specific to its financial relationship with a hospital that provides inpatient care and is not related to its physical location. Ambulatory surgery performed in hospital-owned facilities may be performed within the hospital, in a facility attached to the hospital, or in a facility physically separated from the hospital. The analysis was further limited to ambulatory surgeries performed at facilities owned by community hospitals. Community hospitals are defined as short-term, non-Federal, general, and other specialty hospitals, excluding hospital units of other institutions (e.g., prisons). The analysis was limited to hospitals that had at least one mastectomy procedure performed in both the SID and the SASD in each data year.

Unit of analysis
The unit of analysis is the hospital discharge (i.e., the hospital stay or ambulatory surgery visit), not a person or patient. This means that a person who is admitted to or visits the hospital multiple times in 1 year will be counted each time as a separate discharge or visit from the hospital.

Location of patients' residence
Place of residence is based on the Urban Influence Codes (UIC) urban-rural classification scheme for U.S. counties developed by the U.S. Department of Agriculture's Economic Research Service, as a refinement of the Office of Management and Budget Metropolitan Service Area definition. For this Statistical Brief, we collapsed the UIC categories into either urban or rural according to the following:

Urban:

- Large Metropolitan: includes metropolitan areas with 1 million or more residents
- Small Metropolitan: includes metropolitan areas with fewer than 1 million residents

Rural:

- Micropolitan and Noncore: includes nonmetropolitan counties.

Community-level income
Community-level income is based on the median household income of the patient's ZIP Code of residence. Quartiles are defined so that the total U.S. population is evenly distributed. Cut-offs for the quartiles are determined annually using ZIP Code demographic data obtained from Claritas, a vendor that adds value to data from the U.S. Census Bureau.[9] The value ranges for the income quartiles vary by year. The income quartile is missing for patients who are homeless or foreign.

Payer
Payer is the expected payer for the hospital stay. To make coding uniform across all HCUP data sources, payer combines detailed categories into general groups:

- Medicare: includes patients covered by fee-for-service and managed care Medicare
- Medicaid: includes patients covered by fee-for-service and managed care Medicaid
- Private Insurance: includes Blue Cross, commercial carriers, and private health maintenance organizations (HMOs) and preferred provider organizations (PPOs)
- Uninsured: includes an insurance status of *self-pay* and *no charge*
- Other: includes Workers' Compensation, TRICARE/CHAMPUS, CHAMPVA, Title V, and other government programs

Hospital stays billed to the State Children's Health Insurance Program (SCHIP) may be classified as Medicaid, Private Insurance, or Other, depending on the structure of the State program. Because most State data do not identify patients in SCHIP specifically, it is not possible to present this information separately.

For this Statistical Brief, when more than one payer is listed for a hospital discharge, the first-listed payer is used.

[9] Claritas. Claritas Demographic Profile. www.claritas.com. Accessed June 23, 2017.

Reporting of race and ethnicity
Data on Hispanic ethnicity are collected differently among the States and also can differ from the Census methodology of collecting information on race (White, Black, Asian/Pacific Islander, American Indian/Alaska Native, Other (including mixed race)) separately from ethnicity (Hispanic, non-Hispanic). State data organizations often collect Hispanic ethnicity as one of several categories that include race. Therefore, for multistate analyses, HCUP creates the combined categorization of race and ethnicity for data from States that report ethnicity separately. When a State data organization collects Hispanic ethnicity separately from race, HCUP uses Hispanic ethnicity to override any other race category to create a Hispanic category for the uniformly coded race/ethnicity data element, while also retaining the original race and ethnicity data. This Statistical Brief reports race/ethnicity for the following categories: Hispanic, non-Hispanic White, non-Hispanic Black, and non-Hispanic Other, including Asian/Pacific Islander, American Indian/Alaska Native, and Other.

Trends were not reported because a higher percentage of records for reconstructive surgeries had missing data on race/ethnicity in 2009 (15.2 percent) than in 2014 (7.4 percent). In 2014, two States (Minnesota and Nebraska) did not provide data on race/ethnicity.

Reporting of hospital location
Hospital location is based on the Core Based Statistical Area (CBSA) urban-rural classification scheme for U.S. counties developed by the Office of Management and Budget. Hospitals residing in counties with a CBSA type of metropolitan were considered urban, whereas hospitals with a CBSA type of micropolitan or noncore were classified as rural.

Reporting of hospital teaching status
The hospital's teaching status was obtained from information included in the American Hospital Association Annual Survey of Hospitals. A hospital is considered to be a teaching hospital if it has an approved American Medical Association residency program, is a member of the Council of Teaching Hospitals, or has a ratio of full-time equivalent interns and residents to beds of .25 or higher.

About HCUP

The Healthcare Cost and Utilization Project (HCUP, pronounced "H-Cup") is a family of health care databases and related software tools and products developed through a Federal-State-Industry partnership and sponsored by the Agency for Healthcare Research and Quality (AHRQ). HCUP databases bring together the data collection efforts of State data organizations, hospital associations, and private data organizations (HCUP Partners) and the Federal government to create a national information resource of encounter-level health care data. HCUP includes the largest collection of longitudinal hospital care data in the United States, with all-payer, encounter-level information beginning in 1988. These databases enable research on a broad range of health policy issues, including cost and quality of health services, medical practice patterns, access to health care programs, and outcomes of treatments at the national, State, and local market levels.

HCUP would not be possible without the contributions of the following data collection Partners from across the United States:

Alaska Department of Health and Social Services
Alaska State Hospital and Nursing Home Association
Arizona Department of Health Services
Arkansas Department of Health
California Office of Statewide Health Planning and Development
Colorado Hospital Association
Connecticut Hospital Association
District of Columbia Hospital Association
Florida Agency for Health Care Administration
Georgia Hospital Association
Hawaii Health Information Corporation
Illinois Department of Public Health

Indiana Hospital Association
Iowa Hospital Association
Kansas Hospital Association
Kentucky Cabinet for Health and Family Services
Louisiana Department of Health
Maine Health Data Organization
Maryland Health Services Cost Review Commission
Massachusetts Center for Health Information and Analysis
Michigan Health & Hospital Association
Minnesota Hospital Association
Mississippi State Department of Health
Missouri Hospital Industry Data Institute
Montana Hospital Association
Nebraska Hospital Association
Nevada Department of Health and Human Services
New Hampshire Department of Health & Human Services
New Jersey Department of Health
New Mexico Department of Health
New York State Department of Health
North Carolina Department of Health and Human Services
North Dakota (data provided by the Minnesota Hospital Association)
Ohio Hospital Association
Oklahoma State Department of Health
Oregon Association of Hospitals and Health Systems
Oregon Office of Health Analytics
Pennsylvania Health Care Cost Containment Council
Rhode Island Department of Health
South Carolina Revenue and Fiscal Affairs Office
South Dakota Association of Healthcare Organizations
Tennessee Hospital Association
Texas Department of State Health Services
Utah Department of Health
Vermont Association of Hospitals and Health Systems
Virginia Health Information
Washington State Department of Health
West Virginia Department of Health and Human Resources, West Virginia Health Care Authority
Wisconsin Department of Health Services
Wyoming Hospital Association

About the SID

The HCUP State Inpatient Databases (SID) are hospital inpatient databases from data organizations participating in HCUP. The SID contain the universe of the inpatient discharge abstracts in the participating HCUP States, translated into a uniform format to facilitate multistate comparisons and analyses. Together, the SID encompass more than 95 percent of all U.S. community hospital discharges. The SID can be used to investigate questions unique to one State, to compare data from two or more States, to conduct market-area variation analyses, and to identify State-specific trends in inpatient care utilization, access, charges, and outcomes.

About the SASD

The HCUP State Ambulatory Surgery and Services Databases (SASD) include encounter-level data for ambulatory surgeries and may also include various types of outpatient services such as observation stays, lithotripsy, radiation therapy, imaging, chemotherapy, and labor and delivery. The specific types of ambulatory surgery and outpatient services included in each SASD vary by State and data year. All SASD include data from hospital-owned ambulatory surgery facilities. In addition, some States include data from facilities not owned by a hospital. The designation of a facility as hospital-owned is specific to

its financial relationship with a hospital that provides inpatient care and is not related to its physical location. Hospital-owned ambulatory surgery and other outpatient care facilities may be contained within the hospital, physically attached to the hospital, or located in a different geographic area. In order to provide information that is comparable across all States, analysis was restricted to hospital-owned ambulatory surgery.

For More Information

For other information on mastectomies, including reconstructive surgeries following mastectomy, refer to the HCUP Statistical Briefs located at www.hcup-us.ahrq.gov/reports/statbriefs/sb_womens.jsp.

For additional HCUP statistics, visit:

- HCUP Fast Stats at www.hcup-us.ahrq.gov/faststats/landing.jsp for easy access to the latest HCUP-based statistics for health information topics
- HCUPnet, HCUP's interactive query system, at www.hcupnet.ahrq.gov/

For more information about HCUP, visit www.hcup-us.ahrq.gov/.

For a detailed description of HCUP and more information on the design of the State Inpatient Databases (SID) and the State Ambulatory Surgery and Services Databases (SASD), please refer to the following database documentation:

Agency for Healthcare Research and Quality. Overview of the State Inpatient Databases (SID). Healthcare Cost and Utilization Project (HCUP). Rockville, MD: Agency for Healthcare Research and Quality. Updated June 2016. www.hcup-us.ahrq.gov/sidoverview.jsp. Accessed January 31, 2017.

Agency for Healthcare Research and Quality. Overview of the State Ambulatory Surgery and Services Databases (SASD). Healthcare Cost and Utilization Project (HCUP). Rockville, MD: Agency for Healthcare Research and Quality. Updated June 2016. www.hcup-us.ahrq.gov/sasdoverview.jsp. Accessed January 31, 2017.

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AHRQ welcomes questions and comments from readers of this publication who are interested in obtaining more information about access, cost, use, financing, and quality of health care in the United States. We also invite you to tell us how you are using this Statistical Brief and other HCUP data and tools, and to share suggestions on how HCUP products might be enhanced to further meet your needs. Please e-mail us at hcup@ahrq.gov or send a letter to the address below:

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