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Trends in Hysterectomies and Oophorectomies in Hospital Inpatient and Ambulatory Settings, 2005–2013

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Introduction

Hysterectomy—removal of the uterus—is the second most common surgical procedure among women in the United States, with more than 265,000 hysterectomies performed annually in the inpatient setting.[1] Recent research has shown a decrease in the overall rate of hysterectomies and a large increase in the proportion of hysterectomies performed in an outpatient setting.[2,3] However, these studies were restricted to either commercially insured women without cancer or women receiving treatment for benign uterine fibroids.

Oophorectomy is a surgical procedure that removes one or both ovaries. Nearly 200,000 oophorectomies are performed annually in the inpatient setting among women in the United States.[4] Elective oophorectomy is routinely offered to older women at the time of hysterectomy to prevent the development of ovarian cancer.[5] Similar patterns of decreasing overall rates of oophorectomy with increasing proportions performed in an outpatient setting have been identified among commercially insured women.[6]

This Healthcare Cost and Utilization Project (HCUP) Statistical Brief presents data on hysterectomies and oophorectomies among adult women using all-payer data in two hospital settings:

Highlights

- In five States in 2013, there were 65,900 hospital visits in which a hysterectomy, an oophorectomy, or both surgeries were performed. Of these surgeries, 60.4 percent occurred in the outpatient setting.
- The rate of hysterectomy surgeries (across inpatient and ambulatory surgery settings) decreased 12.3 percent from 2005 to 2013. The trend varied depending on whether an oophorectomy was performed at the same time: the rate increased 14.8 percent when hysterectomy was performed alone and decreased 29.4 percent when the hysterectomy and oophorectomy were combined.
- The rate of oophorectomy alone decreased 11.9 percent from 2005 to 2013.
- In five States in 2013, 26,400 hysterectomy and oophorectomy surgeries were performed during the same hospital-based visit. These surgeries performed in combination were done slightly more often in the inpatient setting (53 percent) than in the outpatient setting (47 percent).
- In five States, benign neoplasms and other gynecological and maternal conditions were the most common conditions related to hysterectomy and oophorectomy surgeries in 2013.
- Regardless of the condition related to the surgery, women aged 55 years and older were more likely to have oophorectomy and hysterectomy surgeries performed in combination.

[1] HCUPnet. Healthcare Cost and Utilization Project (HCUP). 2013. Agency for Healthcare Research and Quality, Rockville, MD. http://hcupnet.ahrq.gov/. Accessed June 23, 2016.
[2] Barrett ML, Weiss AJ, Stocks C, Steiner CA, Myers ER. Procedures to Treat Benign Uterine Fibroids in Hospital Inpatient and Hospital-Based Ambulatory Surgery Settings, 2013. HCUP Statistical Brief #200. January 2016. Agency for Healthcare Research and Quality, Rockville, MD. http://www.hcup-us.ahrq.gov/reports/statbriefs/sb200-Procedures-Treat-Uterine-Fibroids.pdf. Accessed October 17, 2016.
[3] Doll KM, Dusetzina SB, Robinson W. Trends in inpatient and outpatient hysterectomy and oophorectomy rates among commercially insured women in the United States, 2000-2014. JAMA Surgery. 2016;151(9):876–7.
[4] HCUPnet, 2013. Op. cit.
[5] Jacoby VL, Grady D, Wactawski-Wende J, Manson JE, Allison MA, Kuppermann M, et al. Oophorectomy vs ovarian conservation with hysterectomy: cardiovascular disease, hip fracture, and cancer in the Women's Health Initiative Observational Study. Archives of Internal Medicine. 2011;171(8):760–8.
[6] Doll KM et al., 2016. Op. cit.

hospital inpatient and hospital-based ambulatory surgery. The analysis is limited to adult women undergoing a hysterectomy, an oophorectomy, or both in combination in five States (Connecticut, Indiana, Kansas, Ohio, and South Carolina) for which hysterectomies and oophorectomies could be identified in both the inpatient and ambulatory surgery settings using International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM) codes.[7] These five States represented 9.3 percent of the total U.S. population in 2013.

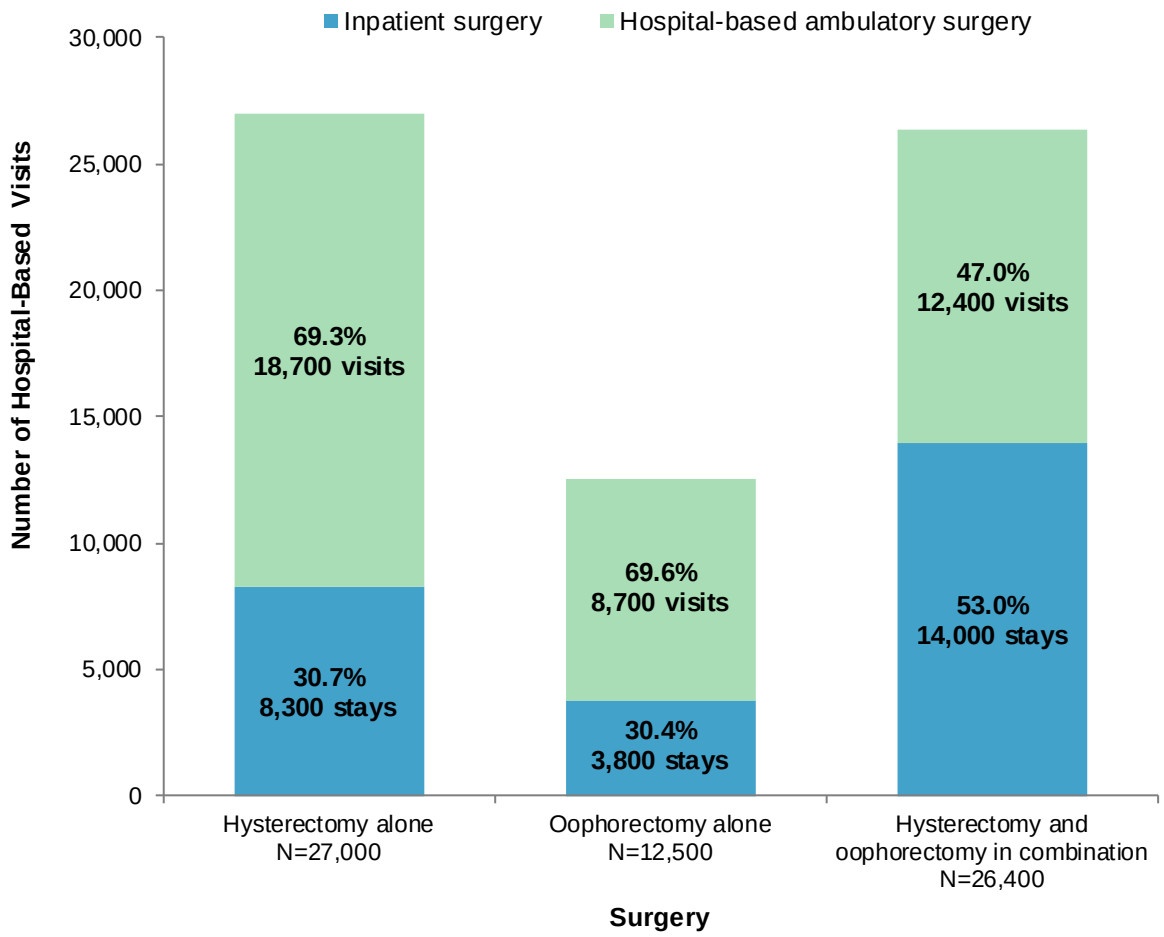
In this Statistical Brief we provide an overview of patient and hospital characteristics for hysterectomies alone, oophorectomies alone, and surgeries when both procedures were performed during the same hospital-based visit—hysterectomy and oophorectomy surgeries "in combination." Trends from 2005 through 2013 in the rates of hysterectomies and oophorectomies, overall and by hospital setting (inpatient and ambulatory surgery), are presented. The distribution in 2013 of surgeries performed by related condition and by age is also provided.

[7] Only ICD-9-CM procedure coding was used. Identification of these surgeries using Current Procedural Terminology (CPT®) procedure codes was not possible because of ambiguity in the reporting of oophorectomy procedures when a hysterectomy is performed. Some CPT codes for hysterectomy may or may not also include an oophorectomy.

Findings

Distribution of hospital-based hysterectomies and oophorectomies, 2013
Figure 1 presents the number of hospital-based visits for hysterectomy, oophorectomy, or both in combination, and the distribution by hospital setting—inpatient or ambulatory surgery—in five States in 2013.

Figure 1. Number and distribution of hysterectomy and oophorectomy surgeries by hospital setting, in five States, 2013



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 five States (Connecticut, Indiana, Kansas, Ohio, and South Carolina), 2013

- **Only 19 percent of inpatient hospitalizations involving hysterectomy, oophorectomy, or both in combination in 2013 were for oophorectomy alone (with no hysterectomy).**

  Of 65,900 hospital visits involving hysterectomy, oophorectomy, or both in combination in 2013, 27,000 hospital visits involved only a hysterectomy (41.0 percent), 26,400 hospital visits involved both a hysterectomy and an oophorectomy in combination (40.1 percent), and 12,500 hospital visits involved only an oophorectomy (19.0 percent).

- **Combined hysterectomy and oophorectomy surgeries were performed more often in the inpatient setting, whereas hysterectomy or oophorectomy surgeries performed alone took place more frequently in the outpatient setting.**

  Of the 26,400 hysterectomy and oophorectomy surgeries in combination, 53.0 percent were performed in the inpatient setting and 47.0 percent were performed as a hospital-based ambulatory surgery. Hospital-based operations for hysterectomy alone or oophorectomy alone were performed more frequently in the outpatient setting (69.3 and 69.6 percent outpatient, respectively). In total, 60.4 percent of the 65,900 hysterectomy or oophorectomy surgeries alone or in combination occurred in the outpatient setting in 2013.

Patient and hospital characteristics related to hysterectomy and oophorectomy surgeries, 2013
Table 1 presents characteristics related to hysterectomy and oophorectomy surgeries comparing surgeries performed in the hospital inpatient setting with those performed in the hospital-based ambulatory surgery setting in 2013.

Table 1. Patient characteristics and outcomes related to hysterectomy and oophorectomy surgeries by setting, in five States, 2013

Characteristics	Hysterectomy alone		Oophorectomy alone		Hysterectomy and oophorectomy in combination	
	Inpatient surgery	Hospital-based ambulatory surgery	Inpatient surgery	Hospital-based ambulatory surgery	Inpatient surgery	Hospital-based ambulatory surgery
Patient characteristics						
Age, mean years	44.6	43.6	49.1	45.0	52.9	49.4
Age, years, rate per 100,000 women[a]						
18–34	36.4	96.3	26.7	61.4	26.7	35.6
35–54	152.4	338.6	40.2	121.7	189.9	191.4
55+	26.0	50.3	31.4	43.9	128.7	83.5
Race/ethnicity, rate per 100,000 women[a]						
White	58.0	155.1	31.2	76.2	118.4	113.4
Black	143.7	206.1	43.3	61.7	136.9	55.3
Hispanic	69.2	71.8	18.2	38.4	58.5	36.5
Other[b]	46.6	73.8	20.3	50.8	85.6	54.3
Expected primary payer, %						
Medicare	10.3	8.1	26.3	12.7	23.6	14.5
Medicaid	17.9	14.3	15.3	14.8	10.9	10.7
Private insurance	62.7	70.2	46.7	64.6	56.8	68.8
Uninsured	5.0	2.9	7.8	4.3	5.7	3.2
Other	4.1	4.4	3.9	3.5	3.0	2.9
Outcomes of hospital stays						
Inpatient length of stay, mean days	2.3	—	4.7	—	3.2	—
Total hospital charges, mean $[c]	33,400	30,000	49,300	22,500	41,900	32,800

[a] The denominator for rates is the age- and race-specific female resident population aged 18 years and older in the five States.

[b] Other race/ethnicity includes Asian/Pacific Islander, American Indian, and Alaskan Native.

[c] We report hospital charges rather than costs because Cost-to-Charge Ratios are not available for ambulatory surgery data.

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 five States (Connecticut, Indiana, Kansas, Ohio, and South Carolina), 2013

- **Women aged 35–54 years had the highest rates of hysterectomy or oophorectomy surgeries per 100,000 women, both alone and in combination, in both inpatient and hospital-based ambulatory surgery settings.**

  Women aged 35–54 years had the highest rates of hysterectomy or oophorectomy alone or in combination in both the inpatient and ambulatory surgery settings in 2013. The rates of hysterectomy alone for women aged 35–54 years were 152.4 and 338.6 per 100,000 women in the inpatient and ambulatory surgery settings, respectively. The rates of oophorectomy alone for women aged 35–54 years were 40.2 and 121.7 per 100,000 women in the inpatient and ambulatory surgery settings, respectively. The rates of hysterectomy and oophorectomy surgeries in combination for women aged 35–54 years were 189.9 and 191.4 per 100,000 women in the inpatient and ambulatory surgery settings, respectively.

  The highest rate for women aged 18–34 years was 96.3 per 100,000 women for hysterectomy alone in the ambulatory surgery setting. The highest rate for women aged 55 years and older was 128.7 per 100,000 women for hysterectomy and oophorectomy surgeries in combination in the inpatient setting.

- **Black women had the highest rates of hysterectomy in both the inpatient and ambulatory settings. Black women had the highest rates of oophorectomy and oophorectomy and hysterectomy in combination in the inpatient setting only.**

  In 2013, Black women had the highest rate of inpatient surgeries for all three types of surgery and the highest rate of hysterectomy alone in the ambulatory surgery setting. For example, the rate of inpatient hysterectomy for Black women (143.7 per 100,000) was more than 2 times higher than for White (58.0 per 100,000) and Hispanic (69.2 per 100,000) women.

  White women had the highest rate of hospital-based ambulatory surgeries for oophorectomy alone (76.2 per 100,000) and hysterectomy and oophorectomy surgeries in combination (113.4 per 100,000) in 2013. For combined hysterectomy and oophorectomy, the rate for White women was more than twice as high as for Black (55.3 per 100,000) and Hispanic (36.5 per 100,000) women.

  In contrast, Hispanic women had the lowest rate for all procedures except for inpatient hysterectomy (69.2 per 100,000), which was slightly higher than the rate for White women (58.0 per 100,000) but still lower than that for Black women (143.7 per 100,000).

- **Private insurance accounted for the largest proportion of both inpatient and hospital-based ambulatory surgery visits with hysterectomy or oophorectomy or both in combination.**

  Private insurance was the expected primary payer for 70.2 percent of hospital-based ambulatory surgery visits with hysterectomy alone, 64.6 percent for oophorectomy alone, and 68.8 percent for combined hysterectomy and oophorectomy—covering more than 4 times as many hospital-based ambulatory surgery visits as the second most frequent payer for each type of surgery.

  Private insurance also accounted for the largest proportion of hospital inpatient stays with hysterectomy or oophorectomy or both in combination for each type of surgery. Medicare covered 26.3 percent of inpatient stays with oophorectomy alone and 23.6 percent of combined hysterectomy/oophorectomy inpatient stays. Medicaid was the expected primary payer for more than 10 percent of hysterectomy or oophorectomy procedures or both in combination for all three types of surgeries in both settings.

- **Inpatient hospital stays for oophorectomy alone had the longest mean length of stay and highest mean hospital charges. Outpatient hospital visits for oophorectomy alone had the lowest mean hospital charges.**

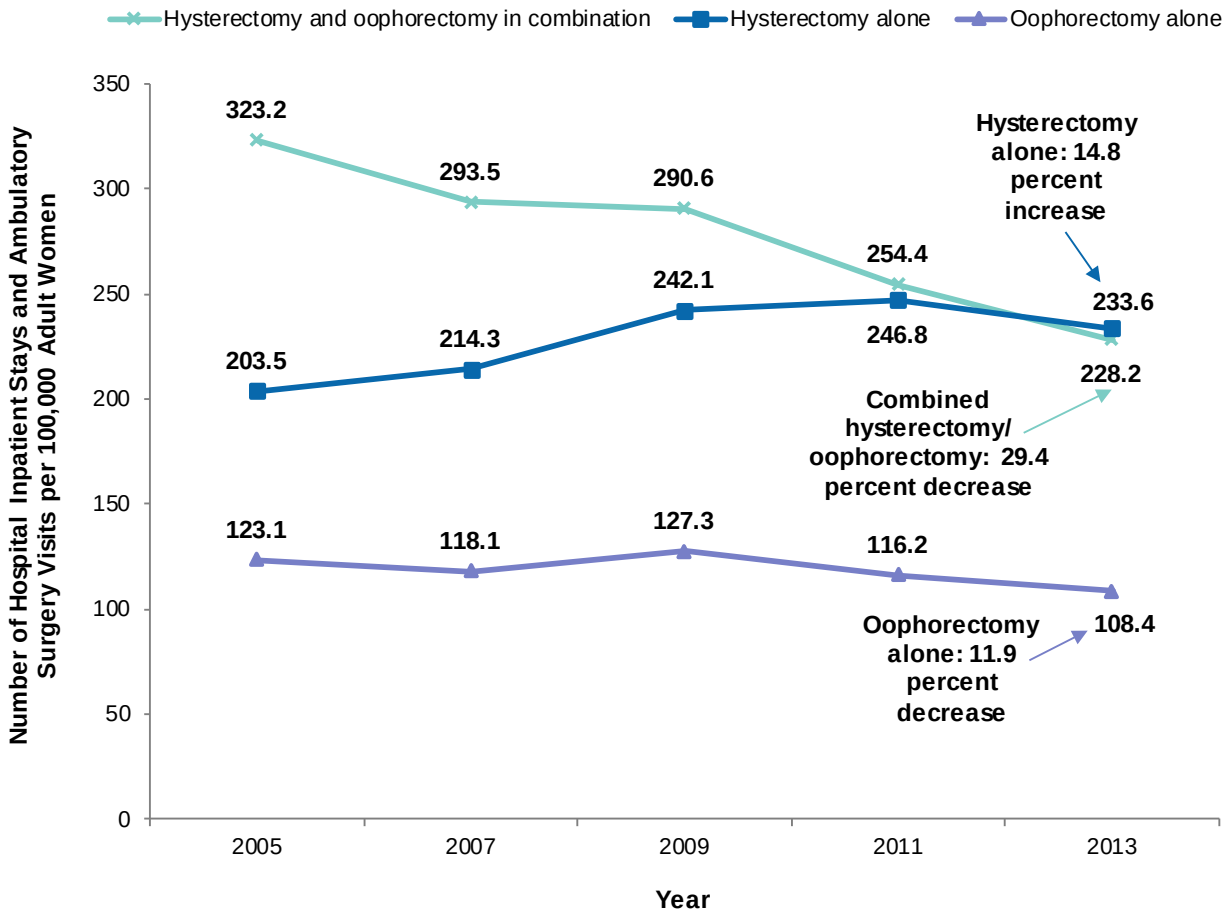
  Inpatient stays with an oophorectomy alone had a mean length of stay of 4.7 days and mean hospital charges of $49,300 in 2013. By comparison, inpatient stays with hysterectomy alone and with

hysterectomy and oophorectomy in combination had mean lengths of stay of 2.3 days and 3.2 days, respectively, and mean hospital charges of $33,400 and $41,900, respectively.

Mean hospital charges for outpatient oophorectomy alone were $22,500 in 2013 compared with $30,000 and $32,800 for outpatient hysterectomy alone and outpatient hysterectomy and oophorectomy surgeries in combination, respectively.

Trends in hospital-based hysterectomies and oophorectomies, 2005–2013
Figure 2 presents trends in the rates of hysterectomy and oophorectomy surgeries from 2005 through 2013 for inpatient and ambulatory surgery settings collectively.

Figure 2. Rates of hysterectomy and oophorectomy surgeries, in five States, 2005–2013



Note: Inpatient and ambulatory surgery settings have been added together in this figure.

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 five States (Connecticut, Indiana, Kansas, Ohio, and South Carolina), 2005, 2007, 2009, 2011, and 2013

- **The rate of hysterectomy alone increased from 2005 to 2013, whereas the rates of oophorectomy alone and combined hysterectomy/oophorectomy decreased.**

  Across both hospital inpatient stays and hospital-based ambulatory surgeries, the rate of hysterectomy alone increased 14.8 percent from 2005 to 2013 (from 203.5 to 233.6 hospital visits per 100,000 adult women). During the same time period, the rate of hospital-based surgery for oophorectomy alone decreased 11.9 percent (from 123.1 to 108.4 hospital visits per 100,000 adult women). The rate of hospital-based surgery for hysterectomy and oophorectomy surgeries in combination decreased 29.4 percent (from 323.2 to 228.2 hospital visits per 100,000 adult women).

- **Although the rate of hysterectomy alone increased, when all hysterectomies were examined (including those with oophorectomy), there was a decline from 2005 to 2013.**

  Across both hospital inpatient stays and hospital-based ambulatory surgeries, the rate of hysterectomy surgeries decreased 12.3 percent from 2005 to 2013 from 526.7 (rate of 323.2 in combination + 203.5 alone) to 461.8 (rate of 228.2 in combination + 233.6 alone) hospital visits per 100,000 adult women (calculation not shown in figure). The rate of oophorectomy surgeries decreased 11.9 percent from 2005 to 2013 from 446.3 (rate of 323.2 in combination + 123.1 alone) to 336.6 (228.2 in combination + 108.4 alone) hospital visits per 100,000 adult women (calculation not shown in figure).

Table 2 breaks down trends from Figure 2 across the hospital inpatient and ambulatory surgery settings from 2005 through 2013.

Table 2. Rates of hysterectomy and oophorectomy surgeries by hospital setting, in five States, 2005–2013

Characteristics	Hysterectomy alone		Oophorectomy alone		Hysterectomy and oophorectomy in combination	
	Inpatient surgery	Hospital-based ambulatory surgery	Inpatient surgery	Hospital-based ambulatory surgery	Inpatient surgery	Hospital-based ambulatory surgery
Rate per 100,000 adult women						
2005	172.1	31.4	67.3	55.8	294.7	28.5
2007	158.7	55.6	58.2	60.0	253.9	39.6
2009	150.9	91.2	56.5	70.8	230.8	59.8
2011	110.3	136.6	41.9	74.2	167.5	87.0
2013	72.1	161.6	33.1	75.3	121.2	107.0
Change in rate, %						
2005–2013	–58.1	414.4	–50.8	35.0	–58.9	275.9
Average annual change, %	–10.3	22.7	–8.5	3.8	–10.5	18.0

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 five States (Connecticut, Indiana, Kansas, Ohio, and South Carolina), 2005, 2007, 2009, 2011, and 2013

- **The overall rate of hospital inpatient stays for hysterectomy and oophorectomy surgeries, alone and in combination, per 100,000 adult women steadily decreased from 2005 to 2013.**

  Inpatient stays for hysterectomies alone decreased from 172.1 per 100,000 adult women in 2005 to 72.1 per 100,000 adult women in 2013, a 58.1 percent decrease and an average annual percentage decrease of 10.3. Inpatient stays for oophorectomy alone decreased from 67.3 per 100,000 adult women in 2005 to 33.1 per 100,000 adult women in 2013—a 50.8 percent decrease and an average annual percentage decrease of 8.5 percent. Inpatient stays for hysterectomy and oophorectomy surgeries in combination decreased from 294.7 per 100,000 adult women in 2005 to 121.2 per 100,000 adult women in 2013, a 58.9 percent decrease and an average annual percentage decrease of 10.5 percent.

- **The rate of hospital-based ambulatory surgeries for hysterectomy and oophorectomy, alone and in combination, steadily increased from 2005 to 2013.**

  Ambulatory surgeries for hysterectomy alone increased from 31.4 per 100,000 adult women in 2005 to 161.6 per 100,000 adult women in 2013, a 414.4 percent increase and an average annual percentage increase of 22.7. Ambulatory surgeries for oophorectomy alone increased from 55.8 per 100,000 adult women in 2005 to 75.3 per 100,000 adult women in 2013, a 35.0 percent increase and

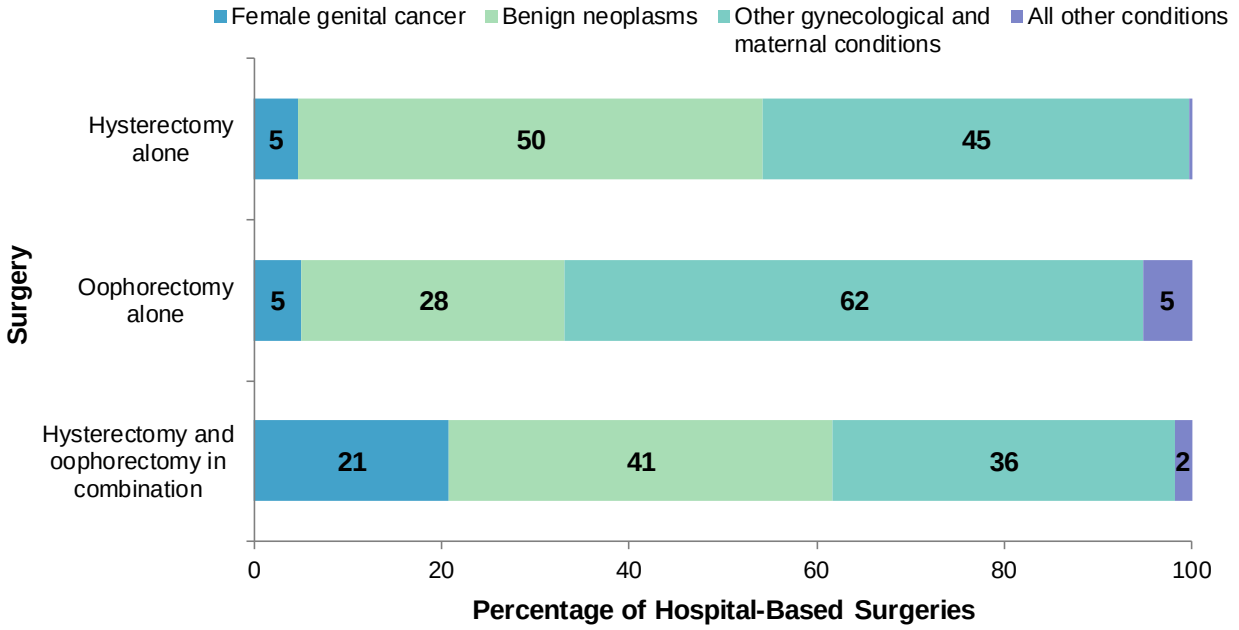
an average annual percentage increase of 3.8. Ambulatory surgeries for hysterectomy and oophorectomy surgeries in combination increased from 28.5 per 100,000 adult women in 2005 to 107.0 per 100,000 adult women in 2013—a 275.9 percent increase and an average annual percentage increase of 18.0.

Conditions related to hysterectomy and oophorectomy, 2013

Hospital inpatient stays and hospital-based ambulatory surgery visits were grouped using the most frequent conditions related to the surgeries. Three related condition groups were defined on the basis of their association with hysterectomy and oophorectomy—female genital cancer, benign neoplasms (e.g., leiomyoma or uterine fibroids), and other gynecological and maternal conditions (e.g., endometriosis, menstrual disorders, menopausal disorders, ectopic pregnancy, prolapse of female genital organs).[8] A fourth residual category comprised all other conditions, which included abdominal pain or hernia, diverticulosis, and other gastrointestinal disorders.

Figure 3 presents the distribution of groups of conditions most frequently related to hysterectomy and oophorectomy in 2013.

Figure 3. Percent distribution of groups of conditions most frequently related to hysterectomy and oophorectomy surgeries, in five States, 2013



Notes: Inpatient and ambulatory surgery settings have been added together in this figure. Surgeries are classified into related condition groups using all-listed diagnoses.

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 five States (Connecticut, Indiana, Kansas, Ohio, and South Carolina), 2013

- **Benign neoplasms and other gynecological and maternal conditions were the most common related conditions for hysterectomy and oophorectomy in 2013.**

  Benign neoplasms were the most common conditions for hysterectomy, alone and in combination with oophorectomy, representing 50 percent of hysterectomy alone, 28 percent of oophorectomy alone, and 41 percent of hysterectomy and oophorectomy in combination.

[8] For more details, see Case Definition Table 3 in the Definitions section.

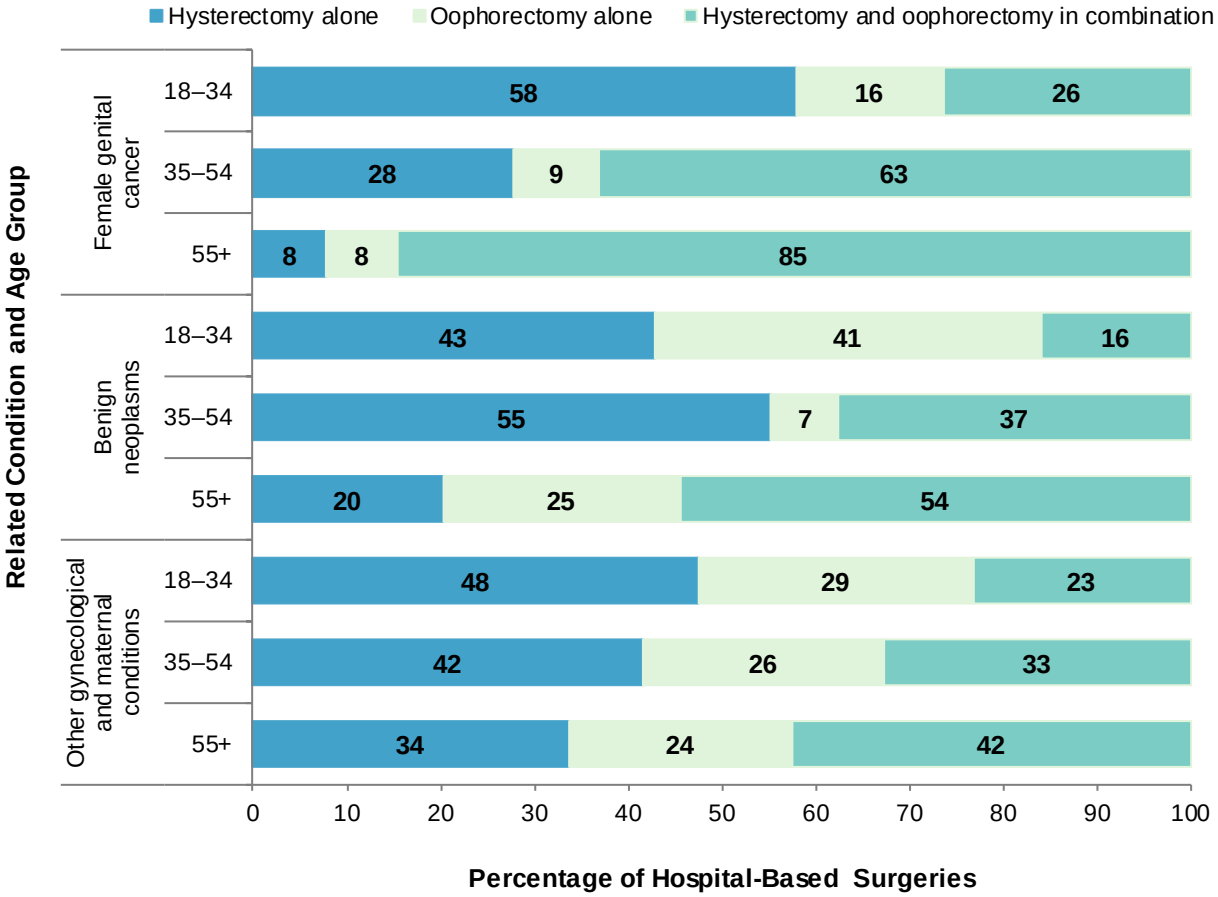
Other gynecological and maternal conditions were the most common related conditions for oophorectomy alone in 2013, at 62 percent. Other gynecological and maternal conditions also represented 45 percent of hysterectomy alone and 36 percent of hysterectomy and oophorectomy in combination.

Female genital cancer was the related condition in just 5 percent of hysterectomy and oophorectomy alone but represented 21 percent of hysterectomy and oophorectomy in combination.

Other remaining conditions, which included abdominal pain or hernia, diverticulosis, and other gastrointestinal disorders, represented less than 1 percent of conditions related to hysterectomy alone, 5 percent of oophorectomy alone, and 2 percent of hysterectomy and oophorectomy in combination.

Figure 4 presents the distribution of hysterectomy and oophorectomy by related condition and age group in 2013.

Figure 4. Percent distribution of hysterectomy and oophorectomy, alone and in combination, by related condition and patient age group, in five States, 2013



Notes: Inpatient and ambulatory surgery settings have been added together in this figure. Surgeries are classified into related condition groups using all-listed diagnoses.

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 five States (Connecticut, Indiana, Kansas, Ohio, and South Carolina), 2013

- **Women aged 55 years and older were less likely to have a hysterectomy alone and more likely to have a hysterectomy and oophorectomy in combination in 2013 across all three related conditions.**

  Regardless of the related conditions, women aged 55 years and older were less likely to have a hysterectomy alone and more likely to have a hysterectomy and oophorectomy in combination during the same hospital-based visit. Among women aged 55 years and older with a female genital cancer diagnosis, 85 percent had a hysterectomy and oophorectomy performed in combination. Among women aged 55 years and older with benign neoplasms or other gynecological and maternal conditions, 54 and 42 percent, respectively, had a hysterectomy and oophorectomy performed in combination.

- **Women under age 55 years with other gynecological and maternal conditions were more likely to have a hysterectomy alone compared with either an oophorectomy alone or hysterectomy and oophorectomy surgeries in combination.**

  Among women aged 18–34 years and 35–54 years with other gynecological and maternal conditions, 48 and 42 percent, respectively, had a hysterectomy alone. As women with other gynecological and maternal conditions became older, an increasing proportion had hysterectomy and oophorectomy surgeries in combination: 23 percent among women aged 18–34 years, 33 percent among women aged 35–54 years, and 42 percent among women aged 55 years and older.

- **Women aged 18–34 years with female genital cancer were more likely to have a hysterectomy alone than to have an oophorectomy, either alone or in combination with a hysterectomy.**

  Among women with female genital cancer, 18–34-year-olds were more likely to have a hysterectomy alone (58 percent) than an oophorectomy (16 percent for oophorectomy alone and 26 percent for hysterectomy and oophorectomy in combination).

- **Over 40 percent of women aged 18–34 years with related benign neoplasms had an oophorectomy alone.**

  Among women aged 18–34 years with a hysterectomy and/or oophorectomy and a related condition of benign neoplasms, 43 percent had a hysterectomy alone and 41 percent had an oophorectomy alone. In contrast, among women aged 35–54 years with related benign neoplasms, 55 percent had a hysterectomy alone and just 7 percent had an oophorectomy alone.

Data Source

The volumes and rates in this Statistical Brief are based upon data from the Healthcare Cost and Utilization Project (HCUP) 2013 State Inpatient Databases (SID) and State Ambulatory Surgery and Services Databases (SASD). This report evaluates inpatient and outpatient surgery data from five States that contributed to the 2013 SID and 2013 SASD: Connecticut, Indiana, Kansas, Ohio, and South Carolina. Historical data were drawn from the same five States in the 2005, 2007, 2009, and 2011 SID and SASD. Analysis was limited to hospitals within the five States that had cases in the inpatient and ambulatory surgery settings in each data year. States were included only if they provided complete outpatient procedure coding that would allow the identification of outpatient procedures by International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) procedure codes. Identification of these surgeries using Current Procedural Terminology (CPT®) procedure codes was not possible because of ambiguity in the reporting of oophorectomy procedures.

Supplemental sources included population denominator data for use with HCUP databases, derived from information available from the Nielsen Company.[9]

Definitions

Diagnoses, procedures, ICD-9-CM, and Clinical Classifications Software (CCS)
The *principal diagnosis* is that condition established after study to be chiefly responsible for the patient's hospital inpatient stay or outpatient visit. *Secondary diagnoses* are concomitant conditions that coexist at the time of the admission or visit or that develop during the stay.

All-listed procedures include all procedures performed during the hospital inpatient stay or outpatient visit, whether for definitive treatment or for diagnostic or exploratory purposes. The *first-listed procedure* is the procedure that is listed first on the discharge record. Inpatient data define this as the *principal procedure*—the procedure that is performed for definitive treatment rather than for diagnostic or exploratory purposes (i.e., the procedure that was necessary to take care of a complication).

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.

CCS categorizes ICD-9-CM diagnosis codes into a manageable number of clinically meaningful categories.[10] This clinical grouper makes it easier to quickly understand patterns of diagnoses. CCS categories identified as Other typically are not reported; these categories include miscellaneous, otherwise unclassifiable diagnoses that may be difficult to interpret as a group.

Case definition
Hospital discharge and ambulatory surgery records with a hysterectomy or oophorectomy were defined based on all-listed procedure codes as identified using the CCS categories for ICD-9-CM procedures. The hysterectomy and oophorectomy in combination category required procedures from both CCS categories on the same hospital-based visit.

- The CCS category defining hysterectomy is 124, Hysterectomy; abdominal and vaginal.
- The CCS category defining oophorectomy is 119, Oophorectomy; unilateral and bilateral.

The related conditions for hospital visits presented in Figures 3 and 4 were defined on the basis of the ICD-9-CM and CCS diagnosis codes in Table 3. Each related condition was defined using all-listed diagnoses (i.e., the principal diagnosis and up to 24 secondary diagnoses). The assignment was based

[9] Barrett M, Hickey K, Coffey R, Levit K. Population Denominator Data for Use with the HCUP Databases (Updated with 2014 Population Data). HCUP Methods Series Report #2015-07. September 1, 2015. U.S. Agency for Healthcare Research and Quality. http://hcup-us.ahrq.gov/reports/methods/2015-07.pdf. Accessed February 17, 2016.
[10] Agency for Healthcare Research and Quality. HCUP Clinical Classifications Software (CCS). Healthcare Cost and Utilization Project (HCUP). Rockville, MD: Agency for Healthcare Research and Quality. Updated June 2015. http://www.hcup-us.ahrq.gov/toolssoftware/ccs/ccs.jsp. Accessed February 17, 2016.

on a hierarchy that first looked for the presence of a female genital cancer diagnosis, then benign neoplasms, then other gynecological and maternal conditions, and finally all other conditions.

Table 3. ICD-9-CM and CCS diagnosis codes for defining related condition for hospital visit

Related condition for hospital visit	Definition
Female genital cancer	Any ICD-9-CM diagnosis codes: • 179. – Malignant neoplasm of uterus, part unspecified • 180.0 – Malignant neoplasm of endocervix • 180.1 – Malignant neoplasm of exocervix • 180.8 – Malignant neoplasm of other specified sites of cervix • 180.9 – Malignant neoplasm of cervix uteri, unspecified site • 181. – Malignant neoplasm of placenta • 182.0 – Malignant neoplasm of corpus uteri, except isthmus • 182.1 – Malignant neoplasm of isthmus • 182.8 – Malignant neoplasm of other specified sites of body of uterus • 183.0 – Malignant neoplasm of ovary • 183.2 – Malignant neoplasm of fallopian tube • 183.3 – Malignant neoplasm of broad ligament of uterus • 183.4 – Malignant neoplasm of parametrium • 183.5 – Malignant neoplasm of round ligament of uterus • 183.8 – Malignant neoplasm of other specified sites of uterine adnexa • 183.9 – Malignant neoplasm of uterine adnexa, unspecified site • 184.0 – Malignant neoplasm of vagina • 184.1 – Malignant neoplasm of labia majora • 184.2 – Malignant neoplasm of labia minora • 184.3 – Malignant neoplasm of clitoris • 184.4 – Malignant neoplasm of vulva, unspecified site • 184.8 – Malignant neoplasm of other specified sites of female genital organs • 184.9 – Malignant neoplasm of female genital organs, site unspecified • 233.1 – Carcinoma in situ of cervix uteri • 233.2 – Carcinoma in situ of other and unspecified parts of uterus • 233.3 – Carcinoma in situ, unspecified female genital, not elsewhere classified (for hospitalizations through 09/30/07) • 233.30 – Carcinoma in situ, unspecified female genital organ (for hospitalizations beginning 10/01/2007) • 233.31 – Carcinoma in situ, vagina (for hospitalizations beginning 10/01/2007) • 233.32 – Carcinoma in situ, vulva (for hospitalizations beginning 10/01/2007) • 233.39 – Carcinoma in situ, other female genital organ (for hospitalizations beginning 10/01/2007) • 236.0 – Neoplasm of uncertain behavior of uterus • 236.1 – Neoplasm of uncertain behavior of placenta • 236.2 – Neoplasm of uncertain behavior of ovary • 236.3 – Neoplasm of uncertain behavior of other and unspecified female genital organs

Related condition for hospital visit	Definition
Benign neoplasms	Any diagnosis for inpatient stays or ambulatory surgery visits with CCS diagnosis category: • 46: Benign neoplasm of uterus Or any ICD-9-CM diagnosis codes: • 220. – Benign neoplasm of ovary • 221.0 – Benign neoplasm of fallopian tube and uterine ligaments • 221.1 – Benign neoplasm of vagina • 221.2 – Benign neoplasm of vulva • 221.8 – Benign neoplasm of other specified sites of female genital organs • 221.9 – Benign neoplasm of female genital organ, site unspecified
Other gynecological and maternal conditions	Any diagnosis for inpatient stays or ambulatory surgery visits with CCS diagnosis categories: • 168: Inflammatory diseases of female pelvic organs • 169: Endometriosis • 170: Prolapse of female genital organs • 171: Menstrual disorders • 172: Ovarian cyst • 173: Menopausal disorders • 174: Female infertility • 175: Other female genital disorders • 176: Contraceptive and procreative management • 177: Spontaneous abortion • 178: Induced abortion • 179: Postabortion complications • 180: Ectopic pregnancy • 181: Other complications of pregnancy • 182: Hemorrhage during pregnancy; abruptio placenta; placenta previa • 183: Hypertension complicating pregnancy; childbirth and the puerperium • 184: Early or threatened labor • 185: Prolonged pregnancy • 186: Diabetes or abnormal glucose tolerance complicating pregnancy; childbirth; or the puerperium • 187: Malposition; malpresentation • 188: Fetopelvic disproportion; obstruction • 189: Previous C-section • 190: Fetal distress and abnormal forces of labor • 191: Polyhydramnios and other problems of amniotic cavity • 192: Umbilical cord complication • 193: OB-related trauma to perineum and vulva • 195: Other complications of birth; puerperium affecting management of mother
All other conditions	All other diagnoses including but not limited to cancer of breast (CCS category 24), cancer of colon (CCS category 14), other gastrointestinal disorders (CCS category 155), abdominal pain (CCS category 251), and diverticulosis and diverticulitis (CCS category 146).

Abbreviations: CCS, Clinical Classifications Software; ICD-9-CM, International Classification of Diseases, Ninth Revision, Clinical Modification; OB, obstetric.

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. The analysis was limited to hospitals that had at least one hysterectomy or oophorectomy performed in both the SID and the SASD in each data year.

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 hysterectomy or oophorectomy 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) for an inpatient stay or ambulatory surgery, not a person or patient. This means that a person who is admitted to the hospital to have surgery multiple times in 1 year will be counted each time as a separate discharge from the hospital.

Average annual percentage change
Average annual percentage change was calculated using the following formula:

$$\text{Average annual percentage change} = \left[\left(\frac{\text{End value}}{\text{Beginning value}}\right)^{\frac{1}{\text{change in years}}} - 1\right] \times 100$$

Charges
Charges represent what the hospital billed for the discharge. Hospital charges reflect the amount the hospital charged for the entire hospital stay and do not include professional (physician) fees. For the purposes of this Statistical Brief, charges are rounded to the nearest hundred dollars.

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

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

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. All of the States included in the analyses for this Statistical Brief report Hispanic ethnicity. This Statistical Brief reports race/ethnicity for the following categories: Hispanic, non-Hispanic White, non-Hispanic Black, and non-Hispanic Other (includes non-Hispanic Asian/Pacific Islander and non-Hispanic American Indian/Alaska Native).

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 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 and Hospitals
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 Department of Health
Missouri Hospital Industry Data Institute
Montana MHA - An Association of Montana Health Care Providers
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 Health Care Authority
Wisconsin Department of Health Services
Wyoming Hospital Association

About Statistical Briefs

HCUP Statistical Briefs are descriptive summary reports presenting statistics on hospital inpatient and emergency department use and costs, quality of care, access to care, medical conditions, procedures, patient populations, and other topics. The reports use HCUP administrative health care data.

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. This analysis was restricted to hospital-owned ambulatory surgery.

For More Information

For other information on women's health, including hysterectomies, refer to the HCUP Statistical Briefs located at http://www.hcup-us.ahrq.gov/reports/statbriefs/sb_womens.jsp.

For additional HCUP statistics, visit:

- HCUP Fast Stats at http://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 http://hcupnet.ahrq.gov/

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

For a detailed description of HCUP and more information on the design of the State Inpatient Databases (SID) and 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 January 2016. http://www.hcup-us.ahrq.gov/sidoverview.jsp. Accessed February 17, 2016.

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 November 2015. http://www.hcup-us.ahrq.gov/sasdoverview.jsp. Accessed February 17, 2016.

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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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