

STATISTICAL BRIEF #206

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HIV Hospital Stays in the United States, 2006–2013

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Introduction

Human immunodeficiency virus (HIV) is a global health problem, causing over 34 million deaths since the virus was first identified in the early 1980s. In the United States, approximately 675,000 people with HIV have died.¹ Currently, 1.2 million people in the United States are living with HIV, and an estimated 50,000 new infections occur each year.² Since 1996, the availability of combination antiretroviral therapy to suppress the virus has allowed more people with HIV to live healthier and longer lives. By mid-2015, over 15 million people worldwide were receiving these medications.³ Between 2000 and 2015, new HIV infections decreased worldwide by 35 percent and HIV-related deaths decreased by 24 percent.⁴

These improvements in care are helping to transform HIV disease from a rapidly fatal illness to a chronic condition—leading, in turn, to the growth of an aging HIV-positive population. By 2020, it is expected that the majority of people with HIV disease in the United States will be aged 50 years or older—compared with 2009, when only one-third of people with HIV were that age.⁵

Access to medications for HIV disease has been supported by a number of health policies and programs. Since 1990, the Ryan White Program has served as a “payer of last resort” for people with HIV who are under- or uninsured, providing HIV medications to people with minimal or no prescription drug coverage through the AIDS Drug Assistance Programs in all 50 states.⁶ Historically, Medicaid has been the most common source of coverage for people with HIV,⁷ and the 2010 Patient Protection and Affordable Care Act called for expanding Medicaid to nearly all adults with incomes of up to 138 percent of the Federal Poverty Level. In June

Highlights

- Hospital stays with a principal HIV diagnosis decreased by 49 percent between 2006 and 2013, from 72,486 to 36,970.
- The rate of stays per 100,000 population rose for patients aged 55 years and older, increasing by 27 percent among patients aged 55–64 years and by 57 percent among patients aged 65 years and older. For all other age groups, hospitalization rates decreased.
- Aggregate costs of stays involving HIV decreased by 12 percent between 2006 and 2013, from \$3.20 billion to \$2.83 billion.
- Between 2006 and 2013, substance-related disorders among hospitalized HIV patients decreased by 27 percent, from 72,527 to 52,705.
- Disorders of lipid metabolism became one of the 15 most common diagnoses among hospitalized HIV patients in 2013 (32,930 stays). These disorders were not among the top 15 diagnoses in 2006 or in 2010.

¹ Centers for Disease Control and Prevention. Diagnoses of HIV Infection in the United States and Dependent Areas, 2014. HIV Surveillance Report, Vol. 26. November 2015. <http://www.cdc.gov/hiv/pdf/library/reports/surveillance/cdc-hiv-surveillance-report-us.pdf>. Accessed January 26, 2016.

² Centers for Disease Control and Prevention. HIV in the United States: *At a Glance*. 2015. <http://www.cdc.gov/hiv/statistics/overview/ata glance.html>. Accessed January 25, 2016.

³ UNAIDS. 15 by 15: A Global Target Achieved. Geneva, Switzerland: UNAIDS; 2015.

⁴ World Health Organization (WHO). HIV/AIDS. Fact Sheet #360. Updated November 2015. <http://www.who.int/mediacentre/factsheets/fs360/en/>. Accessed January 25, 2016.

⁵ Goldman TR. Living with HIV and growing old. *Health Affairs*. 2014;33:3:359–61

⁶ Kaiser Family Foundation. The Ryan White Program. Menlo Park, CA: Kaiser Family Foundation; March 2013.

<http://kff.org/hiv/aids/fact-sheet/the-ryan-white-program/>. Accessed May 17, 2016.

⁷ Kates J. How the ACA changes pathways to insurance coverage for people with HIV. Menlo Park, CA: Kaiser Family Foundation; September 18, 2012. <http://kff.org/hiv/aids/perspective/how-the-aca-changes-pathways-to-insurance-coverage-for-people-with-hiv/>. Accessed January 25, 2016.

2012, the U.S. Supreme Court ruled that States could decide whether to participate in the Patient Protection and Affordable Care Act Medicaid expansion.

In States that have expanded Medicaid, previously uninsured people with HIV who were not eligible through the traditional income and disability criteria of the Social Security Income program have obtained coverage. A recent analysis using six Healthcare Cost and Utilization Project (HCUP) State Inpatient Databases found that the percentage of uninsured hospital stays among HIV patients fell from 13.7 percent to 5.5 percent between 2012 through 2014 in four Medicaid expansion States, while increasing from 14.5 percent to 15.7 percent in two comparison States that did not expand Medicaid.⁸

The Patient Protection and Affordable Care Act will eliminate the gap in prescription drug coverage (the “donut hole”) in Medicare Part D by 2020, which will reduce copayments on expensive medications for Medicare beneficiaries with HIV. For people who are not eligible for Medicaid or Medicare, the Patient Protection and Affordable Care Act has increased access to private insurance through the State health insurance exchanges that were introduced in late 2014. Insurance plans offered on the exchanges must cover an essential benefits package and cannot include lifetime or annual coverage caps or provisions that limit coverage for pre-existing conditions such as HIV disease.

Despite the progress that has been made in available treatments and coverage expansions, it has been estimated that only 25 percent of people with HIV disease in the United States achieve the viral suppression necessary to maintain long-term health.⁹ People with HIV disease continue to experience opportunistic infections, cancers, and other serious conditions more often than do demographically similar people without HIV. Historically, the most common HIV-related opportunistic infections have been pneumocystis pneumonia and esophageal candidiasis.¹⁰ Other opportunistic infections that rarely occur in patients with intact immune systems include those caused by organisms such as mycobacteria, cryptococcus, and cytomegalovirus. Cancers related to HIV include Kaposi's sarcoma, primary cerebral lymphoma, and non-Hodgkin's lymphoma.¹¹

Because people with HIV disease are living longer, noninfectious complications and comorbid diseases have increased in frequency.¹² Antiretroviral therapy for HIV also involves side effects and long-term toxicities, which may occur more frequently in older patients who have greater risks of pharmacological interactions with non-HIV medications. Antiretroviral therapy is associated with disorders of lipid metabolism.¹³ By accelerating atherosclerosis, HIV medications may also increase the risk of hypertension and stroke.¹⁴ These conditions contribute to disability and mortality among people with HIV disease, and their treatment often involves hospitalization.

This HCUP Statistical Brief updates a previous Brief on hospital stays that included diagnoses of HIV disease from 1998 through 2005.¹⁵ The current Brief presents data from the National (Nationwide) Inpatient Sample from the 2006–2013 period to examine trends in hospital stays that include principal and secondary diagnoses of HIV, as well as age-specific trends in hospitalization rates per 100,000 population. Differences of 10 percent or greater are noted in the text.

As in the previous Statistical Brief on HIV hospitalizations, we report on major HIV-related conditions that usually do not occur in people whose immune systems are not compromised. These conditions are cited

⁸ Hellinger FJ. In four ACA expansion States, the percentage of uninsured hospitalizations for people with HIV declined, 2012–2014. *Health Affairs*. 2015;34(12):2061–8.

⁹ Hall HI, Frazier EL, Rhodes P, Holtgrave DR, Furlow-Parmley C, Tang T, et al. Differences in human immunodeficiency virus care and treatment among subpopulations in the United States. *Journal of the American Medical Association*. 2013;173(14):1337–44.

¹⁰ Beers MH, Jones TV. Human Immunodeficiency Virus Infection. In: *The Merck Manual of Geriatrics*, 3rd ed. Whitehouse Station, NJ: Merck Research Laboratories; 2005:1378–82.

¹¹ Sterling TR, Chaisson RE. General Clinical Manifestations of Human Immunodeficiency Virus Infection. In: Mandell, Douglas, and Bennett's *Principles and Practice of Infectious Diseases*, 6th ed. Philadelphia, PA: Elsevier Churchill Livingstone; 2004:1546–66.

¹² Crum NF, Riffenburgh RH, Wegner S, Agan BK, Tasker SA, Spooner KM, et al. Comparisons of causes of death and mortality rates among HIV-infected persons: analysis of the pre-, early, and late HAART (highly active antiretroviral therapy) eras. *Journal of the Acquired Immune Deficiency Syndromes*. 2006;41:194–200.

¹³ Wohl DA. Considering metabolic issues when initiating HIV therapy. *Current HIV/AIDS Reports*. 2007;4(3):119–25.

¹⁴ Benjamin LA, Bryer A, Emsley HC, Khoo S, Solomon T, Connor MD. HIV infection and stroke: current perspectives and future directions. *Lancet Neurology*. 2012;11(10):878–90.

¹⁵ Zhao Y, Encinosa W, Hellinger F. HIV Hospitalizations in 1998 and 2005. HCUP Statistical Brief #41. November 2007. Agency for Healthcare Research and Quality, Rockville, MD. <http://www.hcup-us.ahrq.gov/reports/statbriefs/sb41.pdf>.

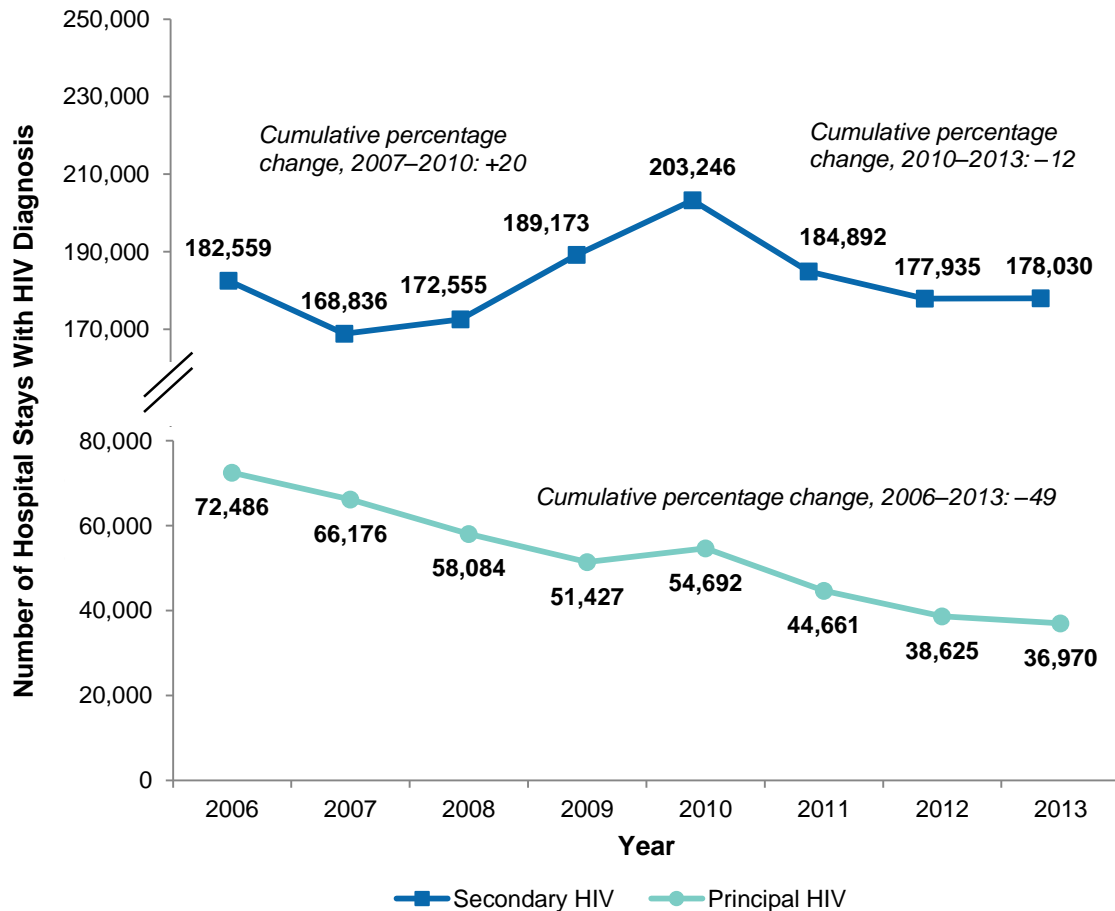
in the 2014 HIV infection surveillance case definition by the Centers for Disease Control and Prevention.¹⁶ Finally, we provide information on the 15 most common diagnoses (principal and secondary) among stays that include any diagnosis of HIV disease for 2006, 2010, and 2013.

Findings

Changes in hospital stays that involve HIV disease, 2006–2013

Figure 1 presents the number of hospital stays that included a principal diagnosis of HIV disease, as well as the number of stays with a secondary HIV diagnosis, for each year between 2006 and 2013.

Figure 1. Hospital stays including a principal or secondary diagnosis of HIV, 2006–2013



Abbreviation: HIV, human immunodeficiency virus

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), Nationwide Inpatient Sample (NIS) 2006–2011, National Inpatient Sample (NIS), 2012–2013.

- **Hospital stays involving a principal HIV diagnosis decreased steadily between 2006 and 2013, whereas stays with a secondary HIV diagnosis increased until 2010, and then decreased.**

Cumulatively, hospital stays with a principal HIV diagnosis decreased by 49 percent between 2006 and 2013 (from 72,486 to 36,970).

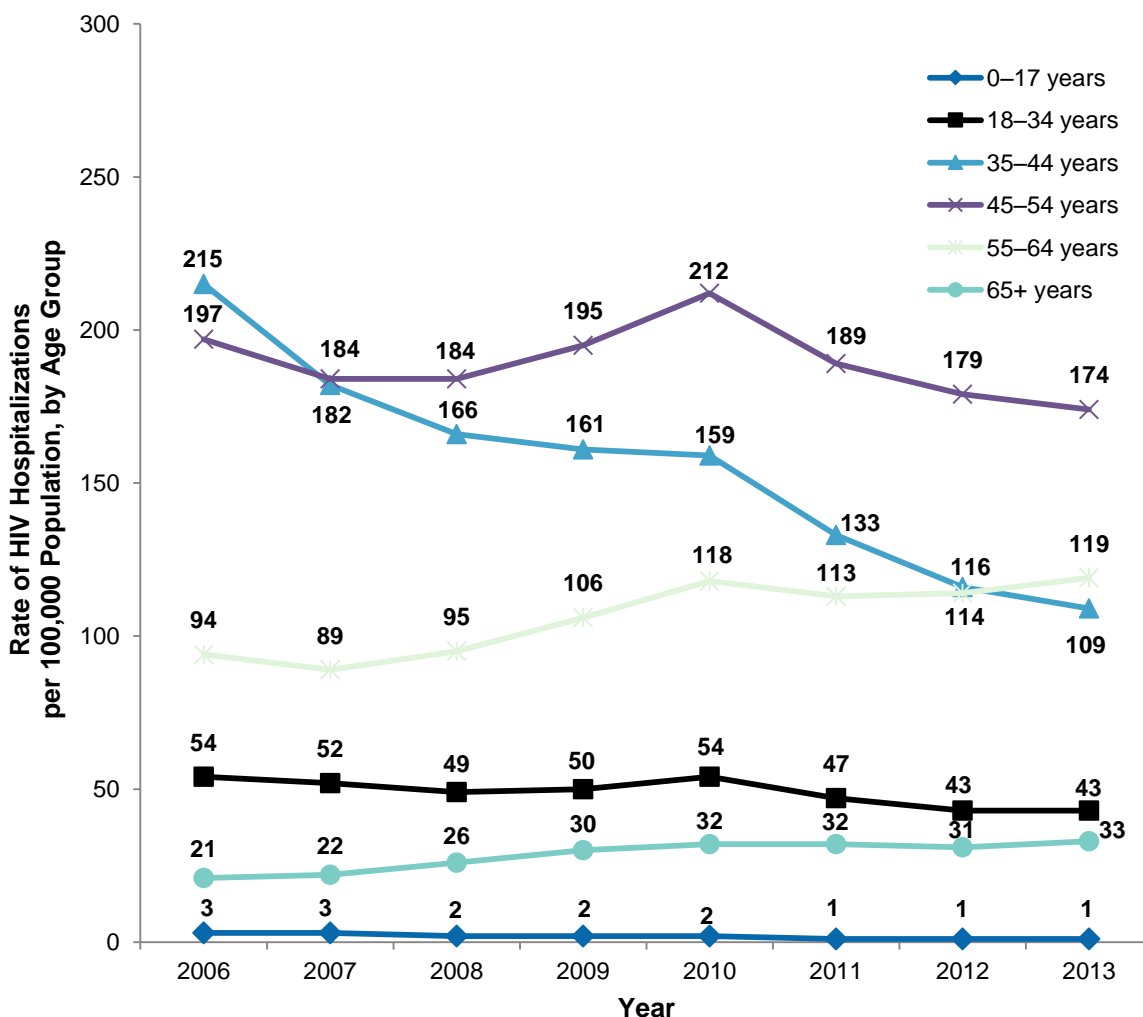
Over the 2006–2013 period, the number of hospital stays with a secondary HIV diagnosis was more volatile than stays with a principal HIV diagnosis. Specifically, the number of stays with a secondary

¹⁶ Selik RM, Mokotoff ED, Branson B, Owen SM, Whitmore S, Hall HI. Revised Surveillance Case Definition for HIV Infection—United States, 2014. *MMWR*. 2014;63(3):1–10.

diagnosis cumulatively increased by 20 percent between 2007 and 2010. This peak of 203,246 stays in 2010 was followed by a 12 percent decrease to 178,030 stays in 2013.

Figure 2 presents the rate of hospital stays that included any diagnosis of HIV disease (principal or secondary) per 100,000 population for six separate age groups, for each year between 2006 and 2013.

Figure 2. Rate of hospital inpatient stays including HIV per 100,000 population by age group, 2006–2013



Abbreviation: HIV, human immunodeficiency virus

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), Nationwide Inpatient Sample (NIS) 2006–2011, National Inpatient Sample (NIS), 2012–2013

- **The rate of hospital stays that included an HIV diagnosis (principal or secondary) per 100,000 population decreased for all groups under age 55, but increased for patients aged 55 years and over.**

Cumulatively, the rate of stays that included an HIV diagnosis decreased for all groups under age 55 years. Decreases in rate of stays by age group were as follows:

- 68 percent among patients under age 18 years (2006: 3 per 100,000 population; 2013: 1 per 100,000 population)
- 20 percent among patients aged 18–34 years (2006: 54 per 100,000 population; 2013: 43 per 100,000 population)

- 49 percent among patients aged 35–44 years (2006: 215 per 100,000 population; 2013: 109 per 100,000 population)

Patients aged 45 to 54 years had rates that peaked in 2010 at 212 per 100,000 population but then decreased by 18 percent to 174 per 100,000 population in 2013.

The rate of hospital stays among patients aged 55 years and over increased between 2006 and 2013 as follows:

- 27 percent among patients aged 55–64 years old (2006: 94 per 100,000; 2013: 119 per 100,000); and
- 57 percent among patients aged 65 years and older (2006: 21 per 100,000 population; 2013: 33 per 100,000 population).

Patient characteristics and resource use for hospital stays involving HIV disease, 2006, 2010, and 2013
 For 2006, 2010, and 2013, Table 1 presents stays with a principal or secondary HIV diagnosis by patient characteristics and resource use, as well as the cumulative percentage change between 2006 and 2013.

Table 1. National estimates of hospital stays that included an HIV diagnosis, 2006, 2010, and 2013

Characteristic/Outcome	2006		2010		2013		Percent change, 2006–2013
	Number of stays	% of stays	Number of stays	% of stays	Number of stays	% of stays	
Total stays (all-listed)	255,035	100.0	257,938	100.0	215,000	100.0	–16
Died during inpatient stay	8,357	3.3	7,689	3.0	5,400	2.5	–35
Patient characteristics							
Sex							
Female	88,511	34.7	90,191	35.0	73,110	34.0	–17
Male	166,524	65.3	167,737	65.0	141,860	66.0	–15
Payer							
Medicare	69,424	27.2	74,319	28.9	71,770	33.4	3
Medicaid	108,356	42.5	106,464	41.5	81,965	38.2	–24
Private	39,450	15.5	37,182	14.5	34,070	15.9	–14
Other	11,095	4.4	8,124	3.2	6,955	3.2	–37
Uninsured	26,522	10.4	30,741	12.0	19,965	9.3	–25
HIV-related conditions^a							
Cytomegaloviral disease	3,699	1.5	3,938	1.5	3,195	1.5	–14
Mycobacterial disease	5,561	2.2	4,926	1.9	3,450	1.6	–38
Toxoplasmosis	3,356	1.3	2,921	1.1	1,515	0.7	–55
Pneumocystosis	13,611	5.3	10,870	4.2	7,790	3.6	–43
Pulmonary tuberculosis	1,768	0.7	1,308	0.5	780	0.4	–56
Candidiasis	34,586	13.6	30,313	11.8	21,865	10.2	–37
Kaposi's sarcoma	2,991	1.2	3,242	1.3	2,500	1.2	–16
History of recurrent pneumonia ^b	1,003	0.4	2,596	1.0	2,535	1.2	153
Weight loss	2,536	1.0	4,833	1.9	5,000	2.3	97
	Mean		Mean		Mean		
Resource use							
Length of stay, mean days	6.8		6.5		6.1		–10
Inflation-adjusted cost per stay, mean, U.S. \$ ^c	12,589		12,719		13,300		6
Inflation-adjusted hospital costs, total, \$ billions ^c	3.20		3.09		2.83		–12

Abbreviations: HIV, human immunodeficiency virus

^a The list of HIV-related conditions is taken from Selik RM, Mokotoff ED, Branson B, Owen SM, Whitmore S, Hall HI. Revised Surveillance Case Definition for HIV Infection—United States, 2014. *MMWR*. 2014;63(3):1–10.

^b This diagnosis is based on a “V code” that specifically indicates a personal history of recurrent pneumonia and may not necessarily indicate active pneumonia during the hospital stay.

^c Costs in 2006 and 2010 were adjusted for inflation to the 2013 level using Gross Domestic Product price indices for those years.

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), Nationwide Inpatient Sample (NIS) 2006–2011, National Inpatient Sample (NIS), 2012–2013

- **Between 2006 and 2013, the number of hospital stays that included HIV diagnoses decreased, as did the number of in-hospital deaths among patients with HIV.**

In 2013, there were 215,000 hospital stays that included a principal or secondary diagnosis of HIV disease, compared with 255,035 in 2006 (16 percent decrease). There were 5,400 in-hospital deaths among HIV patients in 2013, compared with 8,357 deaths in 2006 (35 percent decrease).

- **With the exception of Medicare, hospital stays involving HIV disease decreased for all payer groups.**

Comparing 2006 and 2013, the number of stays including HIV disease that were covered by Medicare was essentially stable.

By contrast, hospital stays involving HIV disease decreased for all other payer groups as follows:

- 24 percent among Medicaid-covered stays
- 14 percent among privately insured stays
- 37 percent among stays with other types of coverage
- 25 percent among uninsured stays

- **HIV-related clinical conditions decreased between 2006 and 2013, with the exception of a history of recurrent pneumonia and weight loss—both of which increased.**

Between 2006 and 2013, diagnoses of weight loss among patient stays with HIV increased by 97 percent and history of recurrent pneumonia increased by 153 percent.

By contrast, diagnoses of other HIV-related clinical conditions decreased between 2006 and 2013 as follows:

- 56 percent for pulmonary tuberculosis
- 55 percent for toxoplasmosis
- 43 percent for pneumocystosis
- 38 percent for mycobacterial disease
- 37 percent for candidiasis
- 16 percent for Kaposi's sarcoma
- 14 percent for cytomegaloviral disease

- **The two most common HIV-related complications in 2006—candidiasis and pneumocystosis—also were the most common complications in 2013.**

Candidiasis and pneumocystosis were the two most common HIV-related complications among HIV hospital stays. In 2006, 13.6 percent of stays involved candidiasis (34,586) and 5.3 percent of stays involved pneumocystosis (13,611). Although the number of stays including these diagnoses decreased by 2013, they continued to be the two most common HIV-related complications: 10.2 percent of HIV stays involved candidiasis (21,865), and 3.6 percent involved pneumocystosis (7,790).

- **Between 2006 and 2013, mean length of stay and aggregate costs of HIV-related stays decreased.**

Mean length of stay of HIV hospital stays decreased by 10 percent between 2006 and 2013, from 6.8 to 6.1 days. Inflation-adjusted aggregate costs for all hospital stays including an HIV diagnosis decreased by 12 percent, from \$3.20 billion in 2006 to \$2.83 billion in 2013.

Table 2 presents the 15 most common all-listed diagnoses for hospital stays that included any diagnosis of HIV disease in 2006, 2010, and 2013.

Table 2. Fifteen most common all-listed diagnoses (principal or secondary) for HIV hospital stays in 2006, 2010, and 2013

Rank	All-listed diagnoses, 2006	Number of stays	% of stays	All-listed diagnoses, 2010	Number of stays	% of stays	All-listed diagnoses, 2013	Number of stays	% of stays
1	HIV disease	255,035	100.0	HIV disease	257,938	100.0	HIV disease	215,000	100.0
2	Hypertension	76,318	29.9	Hypertension	97,595	37.8	Hypertension	93,555	43.5
3	Substance-related disorders	72,527	28.4	Screening and history of mental health and substance abuse codes	87,675	34.0	Screening and history of mental health and substance abuse codes	86,945	40.4
4	Fluid and electrolyte disorders	67,828	26.6	Deficiency and other anemia	77,974	30.2	Fluid and electrolyte disorders	72,125	33.6
5	Deficiency and other anemia	66,129	25.9	Fluid and electrolyte disorders	76,740	29.8	Deficiency and other anemia	69,850	32.5
6	Screening and history of mental health and substance abuse codes	61,668	24.2	Substance-related disorders	64,040	24.8	Renal failure	59,640	27.7
7	Hepatitis	51,618	20.2	Hepatitis	60,493	23.5	Asthma and COPD	54,405	25.3
8	Pneumonia	50,326	19.7	Asthma and COPD	59,885	23.2	Mood disorders	55,245	25.7
9	Asthma and COPD	49,950	19.6	Renal failure	59,084	22.9	Substance-related disorders	52,705	24.5
10	Mood disorders	47,070	18.5	Mood disorders	57,963	22.5	Hepatitis	47,785	22.2
11	Renal failure	42,949	16.8	Pneumonia	46,306	18.0	Diabetes	40,330	18.8
12	Mycoses	40,859	16.0	Diabetes	42,312	16.4	Pneumonia	36,660	17.1
13	Alcohol-related disorders	32,967	12.9	Mycoses	35,697	13.8	Disorders of lipid metabolism	32,930	15.3
14	Diabetes	32,203	12.6	Alcohol-related disorders	32,837	12.7	Nutritional deficiencies	27,570	12.8
15	Bacterial infections, unspecified	24,079	9.4	Nutritional deficiencies	27,530	0.7	Mycoses	25,175	11.7

Abbreviation: COPD, chronic obstructive pulmonary disease; HIV, human immunodeficiency virus

Note: Diagnoses were identified using AHRQ's Clinical Classifications Software (CCS).

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), Nationwide Inpatient Sample (NIS) 2006-2011, National Inpatient Sample (NIS), 2012-2013

■ **Hypertension was the second most common all-listed diagnosis among HIV-related hospital stays, after HIV disease, in 2006, 2010, and 2013.**

Hypertension diagnoses among hospitalized HIV patients increased by 23 percent between 2006 and 2013 (2006: 76,318 stays; 2013: 93,555 stays). Among non-HIV stays, hypertension also was the most common all-listed diagnosis in 2006, 2010, and 2013 (data not shown in table).

- **Renal failure became more common among hospitalized HIV patients between 2006 and 2013, moving up in rank from 11th to 6th in the top 15 all-listed diagnoses.**

Between 2006 and 2013, the number of HIV stays that had an all-listed diagnosis of renal failure increased by 39 percent (2006: 42,949; 2013: 59,640). Among non-HIV stays, renal failure also increased in prevalence between 2006 and 2013 (data not shown in table).

- **Substance-related disorders became less common among hospitalized HIV patients between 2006 and 2013, dropping in rank from third to ninth in the top 15 all-listed diagnoses.**

Between 2006 and 2013, the number of HIV stays that had an all-listed diagnosis of a substance-related disorder decreased by 27 percent (2006: 72,527; 2013: 52,705). For non-HIV stays, substance-related disorders did not appear among the top 15 all-listed diagnoses in 2006, 2010, or 2013 (data not shown in table).

- **Disorders of lipid metabolism ranked as one of the top 15 all-listed diagnoses for hospitalized HIV patients in 2013, but not in 2006 or in 2010.**

The 13th most common all-listed diagnosis in 2013 was disorders of lipid metabolism, involving 32,930 hospital stays (15.3 percent). By contrast, the 15 most common diagnoses for 2006 and 2010 did not include disorders of lipid metabolism. For non-HIV stays, disorders of lipid metabolism ranked among the top 15 conditions in 2006, 2010, and 2013 (data not shown in table).

- **Pneumonia diagnoses became less common among hospitalized HIV patients between 2006 and 2013, dropping in rank from 8th to 12th in the top 15 all-listed diagnoses.**

Between 2006 and 2013, the number of HIV stays that had an all-listed diagnosis of pneumonia decreased by 27 percent (2006: 50,326; 2013: 36,660). For non-HIV stays, pneumonia did not appear among the top 15 all-listed diagnoses in 2006, 2010, or 2013 (data not shown in table).

- **Mycoses became less common among hospitalized HIV patients between 2006 and 2013, dropping in rank from 12th to 15th in the top 15 all-listed diagnoses.**

The number of HIV stays that had an all-listed diagnosis of mycoses decreased from 40,859 in 2006 to 25,175 in 2013—a decrease of 38 percent. For non-HIV stays, mycoses did not appear among the top 15 all-listed diagnoses in 2006, 2010, or 2013 (data not shown in table).

Data Source

The estimates in this Statistical Brief are based upon data from the Healthcare Cost and Utilization Project (HCUP) National Inpatient Sample (NIS) for 2012 and 2013 and the Nationwide Inpatient Sample (NIS) for 2006–2011. Supplemental sources included population denominator data for use with HCUP databases, derived from information available from the Bureau of the Census.¹⁷

Definitions

Diagnoses, ICD-9-CM, Clinical Classifications Software (CCS)

The *principal diagnosis* is the 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.

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

CCS categorizes ICD-9-CM diagnosis codes into a manageable number of clinically meaningful categories.¹⁸ 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

In this report, a hospital stay was designated as including HIV disease if the relevant CCS code for HIV (i.e., CCS #5: ICD-9-CM codes: 042 0420 0421 0422 0429 0430 0431 0432 0433 0439 0440 0449 07953 27910 27919 79571 7958 V08) appeared as any all-listed diagnosis on the patient record.

The ICD-9-CM diagnosis codes used to define HIV-related conditions are listed in Table 3.

Table 3. ICD-9-CM diagnosis codes defining HIV-related conditions

ICD-9-CM code	Definition
Cytomegaloviral disease	
078.5	Cytomegaloviral disease
Mycobacterial disease	
031.0	Pulmonary mycobacterial disease
031.1	Cutaneous mycobacterial disease
031.2	Disseminated mycobacterial disease
031.8	Other specified mycobacterial diseases
031.9	Unspecified diseases due to mycobacteria
Toxoplasmosis	
130.0	Meningoencephalitis due to toxoplasmosis
130.1	Conjunctivitis due to toxoplasmosis
130.2	Chorioretinitis due to toxoplasmosis
130.3	Myocarditis due to toxoplasmosis
130.4	Pneumonitis due to toxoplasmosis
130.5	Hepatitis due to toxoplasmosis
130.7	Toxoplasmosis of other specified sites
130.8	Multisystemic disseminated toxoplasmosis
130.9	Toxoplasmosis, unspecified

¹⁷ 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://www.hcup-us.ahrq.gov/reports/methods/2015-07.pdf>. Accessed February 17, 2016.

¹⁸ 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.

ICD-9-CM code	Definition
Pneumocystosis	
136.3	Pneumocystosis
Pulmonary tuberculosis	
011.0	Tuberculosis of lung, infiltrative
011.1	Tuberculosis of lung, nodular
011.2	Tuberculosis of lung with cavitation
011.3	Tuberculosis of bronchus
011.4	Tuberculous fibrosis of lung
011.5	Tuberculous bronchiectasis
011.6	Tuberculous pneumonia
011.7	Tuberculous pneumothorax
011.8	Other specified pulmonary tuberculosis
011.9	Pulmonary tuberculosis, unspecified
Candidiasis	
112.0	Candidiasis of mouth
112.1	Candidiasis of vulva and vagina
112.2	Candidiasis of urogenital sites
112.3	Candidiasis of skin and nails
112.4	Candidiasis of lung
112.5	Candidiasis, disseminated
112.8	Candidiasis of other specified sites
112.9	Candidiasis of unspecified site
Kaposi's sarcoma	
176.0	Kaposi's sarcoma, skin
176.1	Kaposi's sarcoma, soft tissue
176.2	Kaposi's sarcoma, palate
176.3	Kaposi's sarcoma, gastrointestinal sites
176.4	Kaposi's sarcoma, lung
176.5	Kaposi's sarcoma, lymph nodes
176.8	Kaposi's sarcoma, other specified sites
176.9	Kaposi's sarcoma, unspecified
History of recurrent pneumonia	
V12.61	Personal history of recurrent pneumonia
Weight loss	
783.21	Loss of weight
783.22	Underweight

Types of hospitals included in the HCUP National (Nationwide) Inpatient Sample

The National (Nationwide) Inpatient Sample (NIS) is based on 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). The NIS includes obstetrics and gynecology, otolaryngology, orthopedic, cancer, pediatric, public, and academic medical hospitals. Excluded are long-term care facilities such as rehabilitation, psychiatric, and alcoholism and chemical dependency hospitals. Beginning in 2012, long-term acute care hospitals are also excluded. 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 will be included in the NIS.

Unit of analysis

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

Costs and charges

Total hospital charges were converted to costs using HCUP Cost-to-Charge Ratios based on hospital accounting reports from the Centers for Medicare & Medicaid Services (CMS).¹⁹ *Costs* reflect the actual expenses incurred in the production of hospital services, such as wages, supplies, and utility costs; *charges* represent the amount a hospital billed for the case. For each hospital, a hospital-wide cost-to-charge ratio is used. Hospital charges reflect the amount the hospital billed for the entire hospital stay and do not include professional (physician) fees.

In this Statistical Brief, costs in 2006 and 2010 are adjusted for inflation to the 2013 level using the Gross Domestic Product (GDP) Price Index from the U.S. Department of Commerce, Bureau of Economic Analysis (BEA) for those years.²⁰ That is, all costs are expressed in 2013 dollars. Mean cost per day is calculated as the cost per stay divided by the length of stay and is reported to the nearest hundred.

How HCUP estimates of costs differ from National Health Expenditure Accounts

There are a number of differences between the costs cited in this Statistical Brief and spending as measured in the National Health Expenditure Accounts (NHEA), which are produced annually by CMS.²¹ The largest source of difference comes from the HCUP coverage of inpatient treatment only in contrast to the NHEA inclusion of outpatient costs associated with emergency departments and other hospital-based outpatient clinics and departments as well. The outpatient portion of hospitals' activities has been growing steadily and may exceed half of all hospital revenue in recent years. On the basis of the American Hospital Association Annual Survey, 2012 outpatient gross revenues (or charges) were about 44 percent of total hospital gross revenues.²²

Smaller sources of differences come from the inclusion in the NHEA of hospitals that are excluded from HCUP. These include Federal hospitals (Department of Defense, Veterans Administration, Indian Health Services, and Department of Justice [prison] hospitals) as well as psychiatric, substance abuse, and long-term care hospitals. A third source of difference lies in the HCUP reliance on billed charges from hospitals to payers, adjusted to provide estimates of costs using hospital-wide cost-to-charge ratios, in contrast to the NHEA measurement of spending or revenue. HCUP costs estimate the amount of money required to produce hospital services, including expenses for wages, salaries, and benefits paid to staff as well as utilities, maintenance, and other similar expenses required to run a hospital. NHEA spending or revenue measures the amount of income received by the hospital for treatment and other services provided, including payments by insurers, patients, or government programs. The difference between revenues and costs include profit for for-profit hospitals or surpluses for nonprofit hospitals.

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.

¹⁹ Agency for Healthcare Research and Quality. HCUP Cost-to-Charge Ratio (CCR) Files. Healthcare Cost and Utilization Project (HCUP). 2001–2012. Rockville, MD: Agency for Healthcare Research and Quality. Updated December 2014. <http://www.hcup-us.ahrq.gov/db/state/costtocharge.jsp>. Accessed February 17, 2016.

²⁰ U.S. Bureau of Economic Analysis. National Income and Product Account Tables, Table 1.1.4 Price Indexes for Gross Domestic Product. <http://www.bea.gov/iTable/iTable.cfm?ReqID=9&step=1#reqid=9&step=1&isuri=1>. Accessed February 17, 2016.

²¹ For additional information about the NHEA, see Centers for Medicare & Medicaid Services (CMS). National Health Expenditure Data. CMS Web site May 2014. <http://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/index.html?redirect=/NationalHealthExpendData/>. Accessed February 17, 2016.

²² American Hospital Association. TrendWatch Chartbook, 2014. Table 4.2. Distribution of Inpatient vs. Outpatient Revenues, 1992–2012. <http://www.aha.org/research/reports/tw/chartbook/2014/table4-2.pdf>. Accessed February 17, 2016.

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.

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 NIS

The HCUP National (Nationwide) Inpatient Sample (NIS) is a nationwide database of hospital inpatient stays. The NIS is nationally representative of all community hospitals (i.e., short-term, non-Federal, nonrehabilitation hospitals). The NIS includes all payers. It is drawn from a sampling frame that contains hospitals comprising more than 95 percent of all discharges in the United States. The vast size of the NIS allows the study of topics at the national and regional levels for specific subgroups of patients. In addition, NIS data are standardized across years to facilitate ease of use. Over time, the sampling frame for the NIS has changed; thus, the number of States contributing to the NIS varies from year to year. The NIS is intended for national estimates only; no State-level estimates can be produced.

The 2012 NIS was redesigned to optimize national estimates. The redesign incorporates two critical changes:

- Revisions to the sample design—starting with 2012, the NIS is now a *sample of discharge records from all HCUP-participating hospitals*, rather than a sample of hospitals from which all discharges were retained (as is the case for NIS years before 2012).
- Revisions to how hospitals are defined—the NIS now uses the *definition of hospitals and discharges supplied by the statewide data organizations* that contribute to HCUP, rather than the definitions used by the American Hospital Association (AHA) Annual Survey of Hospitals.

The new sampling strategy is expected to result in more precise estimates than those that resulted from the previous NIS design by reducing sampling error: for many estimates, confidence intervals under the new design are about half the length of confidence intervals under the previous design. The change in sample design for 2012 necessitates recomputation of prior years' NIS data to enable analysis of trends that uses the same definitions of discharges and hospitals.

For More Information

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

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, or visit HCUPnet, HCUP's interactive query system, at <http://hcupnet.ahrq.gov/>.

For information on other HIV hospitalizations in the United States, refer to the following HCUP Statistical Brief located at <http://www.hcup-us.ahrq.gov/reports/statbriefs/statbriefs.jsp>:

- Statistical Brief #41, HIV Hospitalizations in 1998 and 2005

For a detailed description of HCUP and more information on the design of the National (Nationwide) Inpatient Sample (NIS), please refer to the following database documentation:

Agency for Healthcare Research and Quality. Overview of the National (Nationwide) Inpatient Sample (NIS). Healthcare Cost and Utilization Project (HCUP). Rockville, MD: Agency for Healthcare Research and Quality. Updated November 2015. <http://www.hcup-us.ahrq.gov/nisoverview.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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