HIV/AIDS Hospitalizations

Improved medication regimens have led to better quality of life and increased longevity for people living with HIV disease (PLWHA). However, PLWHA continue to experience opportunistic infections, cancer, and other consequences of living with untreated disease. For PLWHA on treatment, long-term antiretroviral therapy can lead to side effects. With more than one third of PLWHA in the U.S. over the age of 50 years, aging-associated illnesses such as cardiovascular disease, arthritis and diabetes are now part of the experience for many people living with HIV disease.

Hospital discharge data allow us to understand the more severe health experiences of PLWHA. Hospitals use diagnostic codes to indicate the reasons for a patient's hospitalization. The primary diagnosis code is used to indicate the main reason for hospitalization. If a patient is admitted to the hospital for the treatment of an HIV-related illness, the primary diagnosis code will be for HIV and the hospitalization is considered a primary HIV hospitalization. If a PLWHA is admitted for treatment of an unrelated condition, the unrelated condition is listed as the primary diagnosis. Additional diagnostic codes are then used to indicate that the patient is living with HIV disease. These types of hospitalizations are considered secondary HIV hospitalizations.

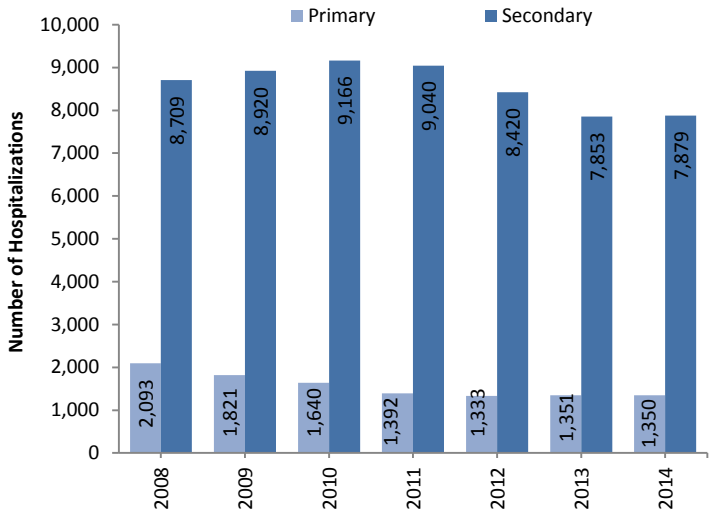
Data reported to the Illinois Department of Public Health's Division of Patient Safety and Quality were utilized to look at hospitalizations among PLWHA from 2008–2014.* Hospital discharge data are not de-duplicated therefore, hospitalizations do not represent unique individuals.

Hospitalizations with HIV as the Primary or Secondary Diagnoses

The annual number of primary HIV hospitalizations decreased by 35% from 2008–2014 (Figure 1). The annual number of secondary HIV hospitalizations also decreased from 2008–2014 from 8,709 to 7,879 hospitalizations (a 10% decrease).

*332 hospitalizations where the patient's ZIP code indicated that the patient did not reside in Illinois were excluded from all analyses

Figure 1. Number of Primary and Secondary HIV Hospitalizations by Year, Illinois, 2008–2014

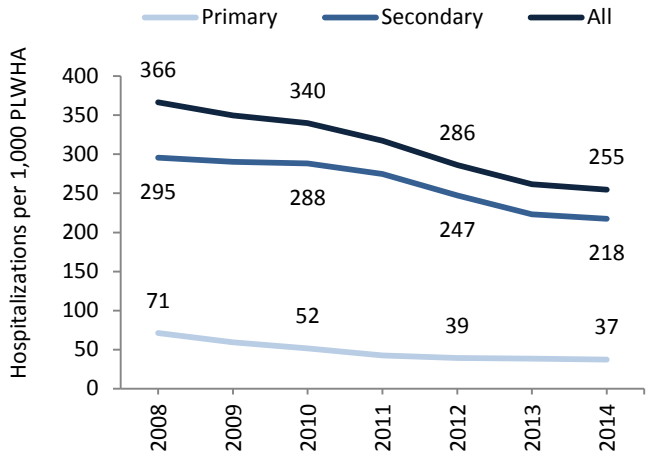


Source: Illinois Department of Public Health, Hospital Discharge Data, 2008–2014

To determine the annual rate of hospitalizations among PLWHA in Illinois, the annual number of hospitalizations was divided by the number of PLWHA (Figure 2) at the end of each calendar year (estimated from the Illinois HIV/AIDS registry). In 2014, there were 37 hospitalizations per 1,000 PLWHA with HIV as the primary reason for admission. The overall rate of hospitalizations (for primary and secondary HIV hospitalizations combined) was 255 per 1,000 PLWHA. By comparison, the overall U.S. hospitalization rate in 2012 was 116 per 1,000 population (AHRQ, 2014).

The rate of primary HIV hospitalizations among PLWHA declined by 48% from 2008–2014 (Figure 2). For secondary HIV hospitalizations, the rate for PLWHA declined by 26%. This decline corresponds with the nationwide trend of decreased hospitalizations. Nationally, overall hospitalizations declined by an average of 0.3% per year from 2003–2008 and by an average of 1.9% per year from 2008–2012 (AHRQ, 2014). Improved treatment of HIV disease and early detection of people infected with HIV have likely contributed to the steep decline in both primary and secondary HIV hospitalizations.

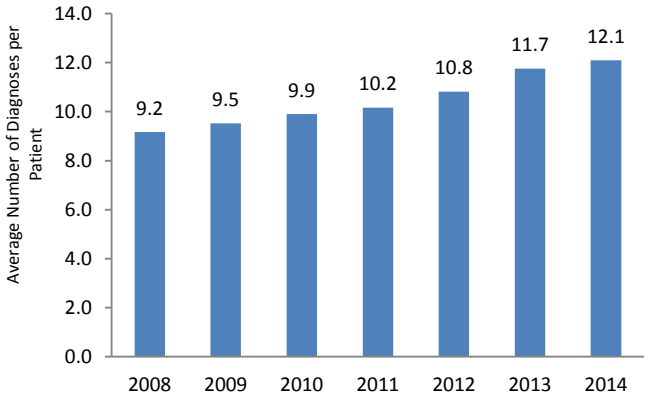
Figure 2. Hospitalization Rates among Persons Living with HIV Disease by Year, Illinois, 2008–2014



Source: Illinois Department of Public Health, Hospital Discharge Data and HIV Surveillance Data 2008–2014

The average number of diagnoses per patient hospitalized with any mention of HIV disease (primary and secondary diagnoses combined) increased from 9.2 diagnostic codes in 2008 to 12.1 diagnostic codes in 2014 (Figure 3). This likely reflects the aging of the population of PLWHA and the increased prevalence of multiple chronic conditions in this population (see Factsheet, "Persons 50 Years and Older").

Figure 3. Average Number of Diagnoses per Patient for Primary and Secondary HIV Hospitalizations Combined by Year, Illinois, 2008–2014



Source: Illinois Department of Public Health, Hospital Discharge Data, 2008–2014

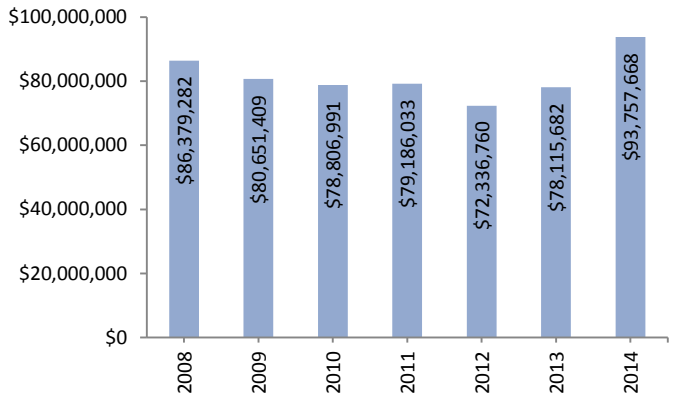
Primary HIV Diagnosis Hospitalizations

The following sections summarize characteristics of hospitalizations where HIV was listed as the primary diagnosis (i.e., HIV disease was the main reason why the patient was hospitalized).

Total Annual Charges

The total annual charges for primary HIV hospitalizations varied from 2008–2014 (Figure 4). In 2014, annual charges for primary HIV hospitalizations totaled almost about $94 million.

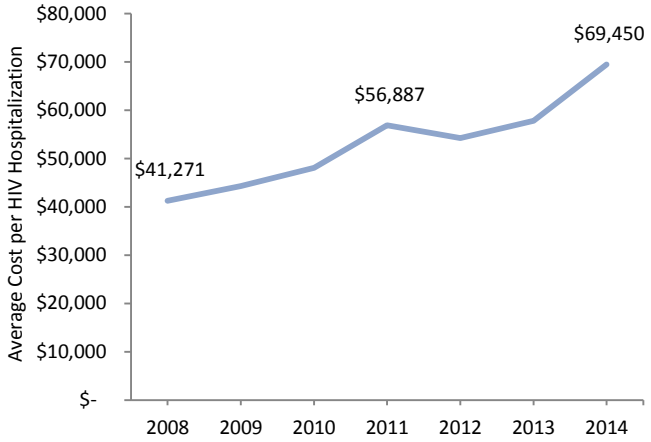
Figure 4. Total Annual Charges for Primary HIV Hospitalizations, Illinois, 2008–2014



Source: Illinois Department of Public Health, Hospital Discharge Data and HIV Surveillance Data 2008–2014

The average annual charges associated with a primary HIV hospitalization increased from $41,271 in 2014 to $69,450 in 2014 (not adjusted for inflation) (Figure 5).

Figure 5. Average Annual Charges per Primary HIV Hospitalization, Illinois, 2008–2014



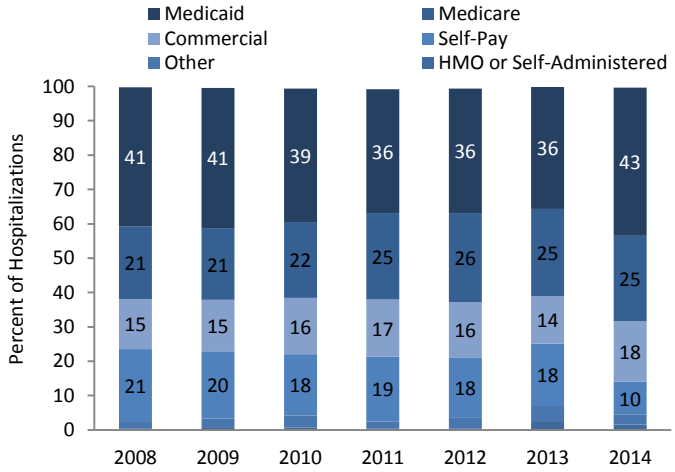
Source: Illinois Department of Public Health, Hospital Discharge Data, 2008–2014

Primary Payer

Medicaid was the largest primary payer of HIV hospitalizations from 2008–2014, followed by Medicare (Figure 6). The largest change from 2008–2014 was for hospitalizations which were self-paid; these decreased from 21% in 2008 to 10% in 2014. This may be a result of the introduction of the Patient Protection and Affordable Care Act (ACA) in

2010 which lowered the uninsured rate in Illinois (Barnett and Vornovitsky). The Medicaid program was expanded in Illinois under the ACA.

Figure 6. Primary Payer Distribution for Primary HIV Hospitalizations by Year, Illinois, 2008–2014

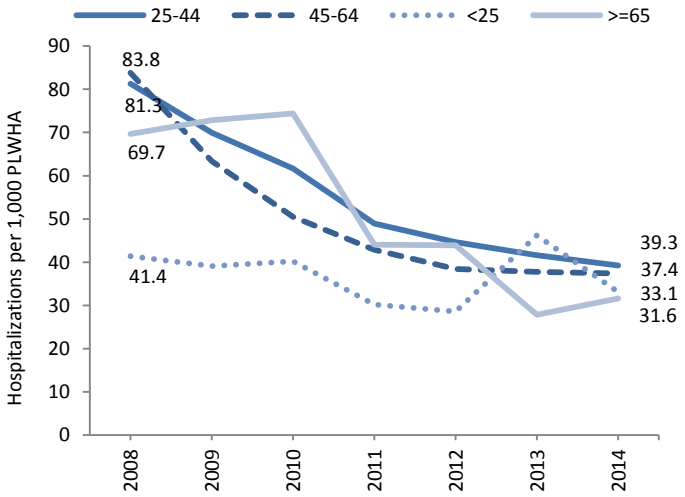


Source: Illinois Department of Public Health, Hospital Discharge Data and HIV Surveillance Data 2008–2014

Age Group

The rate of primary HIV hospitalizations declined across all age groups from 2008–2014 (Figure 7). The largest decline was among adults 45–64 years where the rate declined by 55% from 83.8 to 37.4 hospitalizations per 1,000 PLWHA. In 2008, the highest rate of HIV hospitalizations was among PLWHA 45–64 years. In 2014, the rate of HIV hospitalizations was highest among adults 25–44 years (39.3 hospitalizations per 1,000 PLWHA).

Figure 7. Rate of Primary HIV Hospitalizations by Age Group and Year, Illinois, 2008–2014

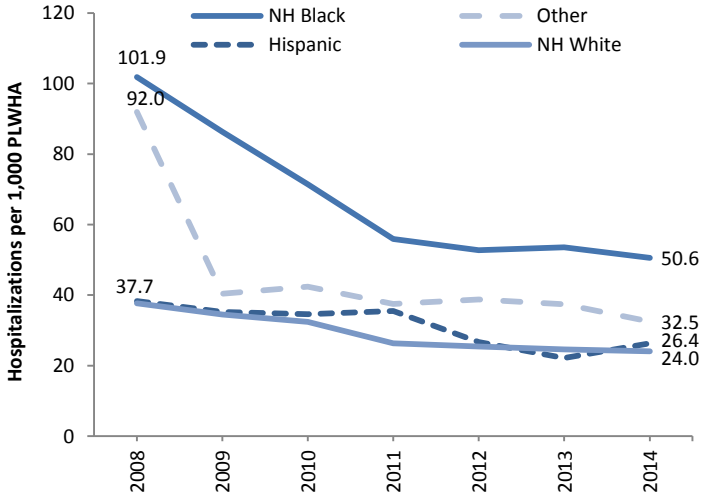


Source: Illinois Department of Public Health, Hospital Discharge Data and HIV Surveillance Data 2008–2014

Race/Ethnicity

Hospitalization rates among all racial/ethnic groups declined from 2008–2014 (Figure 8). Non-Hispanic (NH) blacks had the highest rate of hospitalizations compared to other racial/ethnic groups across this time range. Although there was a steep decline in the hospitalization rate among NH blacks from 2008–2014 (50%), the hospitalization rate for NH black PLWHA was more than double the rate of either NH white PLWHA or Hispanic PLWHA in 2014.

Figure 8. Rate of Primary HIV Hospitalizations by Race/Ethnicity and Year, Illinois, 2008–2014

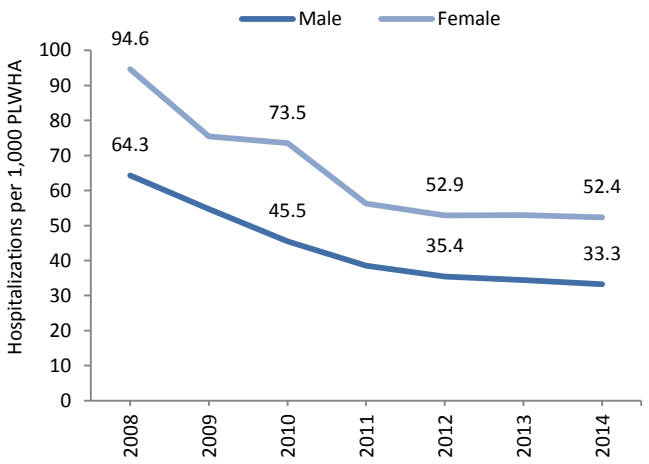


Source: Illinois Department of Public Health, Hospital Discharge Data and HIV Surveillance Data 2008–2014

Sex

The number of HIV hospitalizations was higher among males than females from 2008–2014, reflecting the higher prevalence of HIV disease among males (data not shown). However, the rate of HIV hospitalizations was higher among females than males across the entire time period (Figure 9). There was a similar level of decline in the hospitalization rate among females (45%) and males (48%) from 2008–2014.

Figure 9. Rate of Primary HIV Hospitalizations by Sex, Illinois, 2008–2014

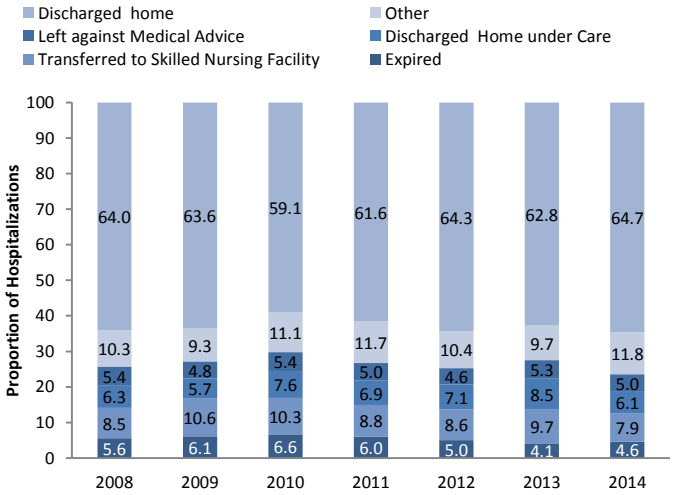


Source: Illinois Department of Public Health, Hospital Discharge Data and HIV Surveillance Data 2008–2014

Discharge Outcomes

The majority of primary HIV hospitalizations resulted in patients being discharged to their homes. Discharge outcomes for primary HIV hospitalizations remained relatively consistent from 2008–2014.

Figure 10. Discharge Outcomes for Primary HIV Hospitalizations, Illinois, 2008–2014

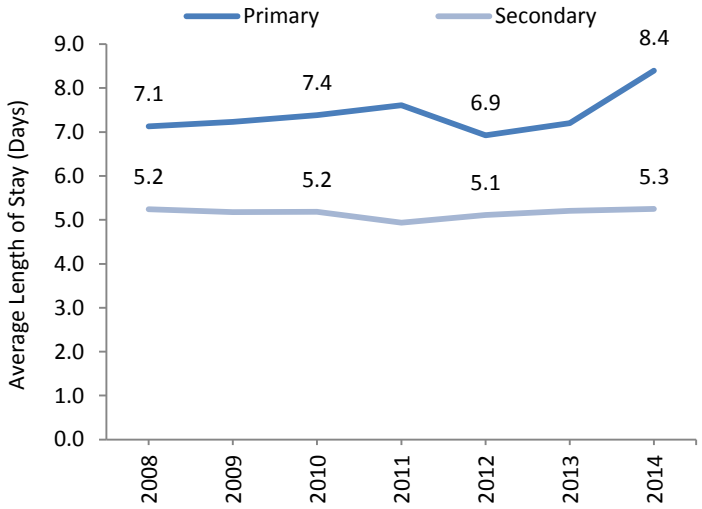


Source: Illinois Department of Public Health, Hospital Discharge Data, 2008–2014

Average Length of Stay

The average length of stay was consistently higher for primary HIV hospitalizations compared to secondary HIV hospitalizations (Figure 11). The average length of stay for primary HIV hospitalizations increased from 7.1 days in 2008 to 8.4 days in 2014. The reasons for this increase are unclear, but the increased number of comorbidities per patient may reflect increased patient complexity over this time period resulting in longer hospital stays (Figure 3).

Figure 11. Average Length of Stay for Primary and Secondary HIV Hospitalizations, Illinois, 2008–2014



Source: Illinois Department of Public Health, Hospital Discharge Data, 2008–2014

Comorbidities

The Agency for Healthcare Research and Quality has developed a system to collapse the large number of hospital diagnostic codes into a smaller number of clinically meaningful categories (AHRQ, 2016). This clinical classification scheme was utilized to look at comorbidities associated with HIV hospitalizations.

Primary Diagnostic Codes

Primary diagnostic codes are utilized to indicate the primary reason for a hospitalization. Among patients hospitalized with any mention of HIV disease, the primary reason for hospitalization in all years was HIV infection. However, from 2008–2014, the proportion of hospitalizations among PLWHA with HIV disease as the primary reason for hospitalization decreased (Table 1) from 19.4% to 14.6%. The second and third most commonly listed reasons for hospitalization among PLWHA were for mood disorders and substance-related issues. Schizophrenia was consistently the fourth most common reason for hospital admission among PLWHA.

Table 1. Fifteen Most Common Primary Diagnoses among Patients Hospitalized with any Diagnosis of HIV Disease, Illinois, 2008–2014

Rank	2008	%	2010	%	2012	%	2014	
1	HIV infection	19.4	HIV infection	15.2	HIV infection	13.7	HIV infection	14.6
2	Mood disorders	9.4	Substance-related	10.1	Mood disorders	8.7	Mood disorders	8.6
3	Substance-related	8.0	Mood disorders	7.3	Substance-related	8.0	Substance-related	4.8
4	Schizophrenia	4.0	Schizophrenia	4.6	Schizophrenia	4.5	Schizophrenia	4.2
5	Pneumonia	4.5	Pneumonia	4.1	Pneumonia	3.8	Septicemia	3.5
6	Septicemia	1.8	Skin infection	2.4	Septicemia	3.0	Pneumonia	3.0
7	Skin infection	2.6	Septicemia	2.4	Skin infection	2.3	Skin infection	2.1
8	Complications device	1.6	Congestive heart failure (non-high blood pressure)	2.0	Alcohol-related	1.7	Congestive heart failure (non-high blood pressure)	2.0
9	Congestive heart failure (non-high blood pressure)	1.6	Complications device	1.8	COPD	1.6	Alcohol-related	1.8
10	Alcohol-related	1.4	Fluid/electrolyte disorders	1.6	Congestive heart failure (non-high blood pressure)	1.6	Complications device	1.8
11	Fluid/electrolyte disorders	1.4	Asthma	1.5	Complications device	1.5	Fluid/electrolyte disorders	1.8
12	Asthma	1.3	Chest pain	1.5	Acute renal failure	1.4	COPD	1.6
13	COPD	0.9	Alcohol-related	1.5	Chest pain	1.3	Asthma	1.6
14	Chest pain	1.6	COPD	1.4	Fluid/electrolyte disorders	1.3	Maintenance chemo- or radiotherapy;	1.5
15	Acute renal failure	0.8	Acute renal failure	1.1	Asthma	1.2	Acute renal failure	1.5

Source: Illinois Department of Public Health, Hospital Discharge Data, 2008–2014

Table 2. Fifteen Most Common Diagnoses among Patients Hospitalized with any Diagnosis of HIV, Illinois, 2008–2014

Rank	2008	#	%	2010	#	%	2012	#	%	2014	#	%
1	HIV infection	10,802	100	HIV infection	10,806	100	HIV infection	9,752	100	HIV infection	9,227	100
2	Anemia	2,987	28	Anemia	3,113	29	Unclassified*	3,340	34	Unclassified*	3,728	40
3	Fluid/electrolyte disorders	2,671	25	Unclassified*	2,883	27	Anemia	2,878	30	Anemia	2,873	31
4	Hypertension	2,587	24	Hypertension	2,762	26	Hypertension	2,653	27	Fluid/electrolyte disorders	2,766	30
5	Unclassified*	2,581	24	Fluid/electrolyte disorders	2,756	26	Fluid/electrolyte disorders	2,578	26	Hypertension	2,614	28
6	Hepatitis	2,293	21	Hepatitis	2,221	21	Other aftercare	1,932	20	Other aftercare	1,941	21
7	Pneumonia	1,831	17	Asthma	1,831	17	Hepatitis	1,833	19	Hepatitis	1,775	19
8	Asthma	1,632	15	Chronic kidney disease	1,706	16	Asthma	1,755	18	Other nutritional dx	1,766	19
9	Other GI dx	1,479	14	Other GI dx	1,629	15	Other nutritional dx	1,571	16	Chronic kidney disease	1,744	19
10	Chronic kidney disease	1,478	14	Pneumonia	1,592	15	Other GI dx	1,568	16	Other nervous dx	1,706	18
11	Other nutritional dx	1,335	12	Hypertension complication	1,431	13	Chronic kidney disease	1,541	16	Asthma	1,694	18
12	Hypertension complication	1,268	12	Other nervous dx	1,390	13	Other nervous dx	1,439	15	Other GI dx	1,580	17
13	Other nervous dx	1,246	12	Other nutritional dx	1,376	13	Pneumonia	1,385	14	Hypertension complication	1,521	16
14	Mycoses	1,216	11	Diabetes, no complications	1,315	12	Hypertension complication	1,330	14	Hyperlipidemia	1,412	15
15	Diabetes, no complications	1,212	11	Other aftercare	1,264	12	Diabetes, no complications	1,228	13	Acute Renal Failure	1,395	15

*Unclassified hospitalizations represent a variety of diagnoses that don't fit into other clinical classification scheme categories

Source: Illinois Department of Public Health, Hospital Discharge Data, 2008–2014

All Diagnostic Codes

The hospital discharge data set includes up to 25 diagnostic codes per hospitalization. Looking across all diagnostic codes, after HIV, anemia, fluid/electrolyte disorders, and hypertension were the most common diagnoses among hospitalizations with any mention of HIV diagnosis from 2008–2014 (Table 2). In 2014, 31% of these hospitalizations included an anemia diagnosis, 30% a diagnosis of fluid/electrolyte disorders, and 28% a diagnosis of hypertension.

Summary

Although HIV hospitalization rates among PLWHA declined from 2008–2014, disparities remain with higher hospitalization rates among women and NH blacks. The increasing number of comorbid conditions and the high proportion of hospitalizations for mental health conditions provide insight into the complexity of providing medical care for this patient population.

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