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Hospital Readmissions Involving Psychiatric Disorders, 2012

Kevin C. Heslin, Ph.D. and Audrey J. Weiss, Ph.D.

Introduction

In 2012, nearly one-fourth of adults in the United States experienced some form of mental or substance use disorder (M/SUD).[1] Many patients who experience M/SUDs are hospitalized for those conditions. Between 2003 and 2011, hospitalization for mental disorders increased at a faster rate than for any other type of hospitalization (i.e., medical, surgical, injury, maternal/neonatal).[2]

Mood disorders and schizophrenia (and other psychotic disorders) were the two most frequent principal diagnoses among hospitalizations involving M/SUD conditions in 2011.[3] Among all hospitalizations in 2011, the sixth most common diagnosis was mood disorders, accounting for nearly 900,000 hospital stays.[4] In addition, mood disorders was the most common reason for hospitalization among children aged 1–17 years.[5]

Mental disorders such as schizophrenia, bipolar disorder, and mood disorders are especially prevalent among Medicare beneficiaries who are under age 65 and eligible for Medicare based on their disability. In 2011, approximately 37 percent of all disabled Medicare beneficiaries had a severe mental disorder.[6]

Hospital readmission within 30 days of discharge usually represents a negative clinical outcome for patients with mental disorders and may be due to factors such as poor access to adequate community-based aftercare and challenges in

Highlights

- In 2012, there were approximately 847,000 hospital stays for mood disorders and 383,000 stays for schizophrenia.

- Within 30 days, 9.0 percent of initial inpatient stays for mood disorders were readmitted with a principal diagnosis of mood disorders, 12.6 percent were readmitted with any diagnosis of mood disorders, and 15.0 percent were readmitted for any cause.

- Within 30 days, 15.7 percent of initial inpatient stays for schizophrenia were readmitted with a principal diagnosis of schizophrenia, 18.6 percent were readmitted with any diagnosis of schizophrenia, and 22.4 percent were readmitted for any cause.

- Only 1.0–1.6 percent of stays for mood disorders or schizophrenia involved home health care following discharge compared with 14.1 percent of stays for conditions other than mental or substance use disorders (M/SUDs).

- Average hospital costs for mood disorders and schizophrenia were lower than average costs for non-M/SUD stays, for the initial stay and for 30-day readmissions.

- Compared with initial stays for mood disorders, average hospital costs were higher for readmissions involving mood disorders and for readmissions for any cause ($7,100 and $7,200, respectively, vs. $5,800).

- Patients covered by Medicare or Medicaid had higher rates of 30-day readmission involving mood disorders or schizophrenia than did privately insured and uninsured patients (approximately 40–75 percent higher).

[1] SAMHSA. Mental and substance use disorders. Updated October 9, 2014. http://www.samhsa.gov/disorders. Accessed March 13, 2015.
[2] Weiss AJ, Barrett ML, Steiner C. Trends and projections in inpatient hospital costs and utilization, 2003–2013. HCUP Statistical Brief #175. July 2014. Agency for Healthcare Research and Quality, Rockville, MD. http://www.hcup-us.ahrq.gov/reports/statbriefs/sb175-Hospital-Cost-Utilization-Projections-2013.pdf. Accessed March 13, 2015.
[3] Agency for Healthcare Research and Quality. HCUPnet Web site. http://hcupnet.ahrq.gov. Accessed March 13, 2015.
[4] Pfuntner A, Wier LM, Stocks C. Most frequent conditions in U.S. hospitals, 2011. HCUP Statistical Brief #162. September 2013. Agency for Healthcare Research and Quality, Rockville, MD. http://www.hcup-us.ahrq.gov/reports/statbriefs/sb162.pdf. Accessed March 13, 2015.
[5] Ibid.
[6] Social Security Administration. SSI Annual Statistical Report, 2011. (Table 6, p. 25.) SSA Publication No. 13-11827. Released September 2012. http://www.ssa.gov/policy/docs/statcomps/ssi_asr/2011/ssi_asr11.pdf. Accessed April 14, 2015.

psychiatric medication adherence and self-care.[7] In 2011, mood disorders and schizophrenia had the highest number of all-cause 30-day hospital readmissions among adult Medicaid patients, reflecting the chronic, relapsing course of these conditions.[8]

This Healthcare Cost and Utilization Project (HCUP) Statistical Brief presents data on hospital readmissions for mood disorders and for schizophrenia and other psychotic disorders (hereafter referred to in the text as *schizophrenia* for brevity). The Brief provides statistics on utilization and costs for hospital inpatient stays for mood disorders and schizophrenia compared with stays for non-M/SUD conditions, along with the rate and cost of readmissions occurring within 30 days of initial hospitalization. The most frequent reasons for 30-day readmission after an initial hospitalization for mood disorders or schizophrenia are also presented. Finally, patient demographic characteristics for readmissions involving mood disorders and schizophrenia are provided. Differences greater than 20 percent between weighted estimates are noted in the text.

Findings

Hospital inpatient stays for mood disorders and schizophrenia, 2012
Table 1 presents utilization and aggregate costs for hospital stays with a principal diagnosis of mood disorders or schizophrenia in 2012. A comparison is provided with all other hospital stays that were unrelated to an M/SUD condition, excluding maternal and neonatal stays.

Table 1. Characteristics of hospital inpatient stays for mood disorders and schizophrenia, 2012

Characteristic	Mood disorders	Schizophrenia	All other non-M/SUD conditions
Number of stays	847,000	383,000	26,441,000
Rate of stays per 100,000 population	269.8	121.9	8,424.1
Average length of stay, days	6.6	10.4	4.8
Aggregate costs, $ (billions)	4.5	3.1	330.7
Discharge disposition, %			
Discharged to home or self-care	88.6	77.7	62.4
Transfer: short-term hospital	2.1	3.0	2.3
Transfer: other type of facility	6.5	16.2	17.6
Home health care	1.0	1.6	14.1
Against medical advice	1.7	1.3	1.1
Died in hospital	0.0	0.0	2.5

Abbreviation: M/SUD, mental or substance use disorder

Note: Categorization of hospital stays was based on the principal diagnosis using Clinical Classifications Software (CCS) as the determining reason for the hospitalization: mood disorders, schizophrenia and other psychotic disorders, or other non-M/SUD conditions (which excluded stays with a principal diagnosis indicating the reason for the visit was maternal or neonatal or an M/SUD).

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

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[7] Vigod SN, Kurdyak PA, Dennis CL, Leszcz T, Taylor VH, Blumberger DM, et al. Transitional interventions to reduce early psychiatric readmissions in adults: systematic review. British Journal of Psychiatry. 2013 Mar;202(3):187-94.
[8] Ibid.

■ **Hospital stays for mood disorders or schizophrenia were substantially longer than stays for non-M/SUD conditions.**

Compared with hospital stays for non-M/SUD conditions, stays for mood disorders were 39 percent longer and stays for schizophrenia were more than twice as long (6.6 and 10.4 days, respectively, vs. 4.8 days).

■ **Hospital stays for mood disorders or schizophrenia were more likely to have a discharge disposition of home or self-care than were stays for non-M/SUD conditions.**

Nearly 89 percent of hospital stays for mood disorders and 78 percent of stays for schizophrenia had a discharge disposition of home or self-care. In contrast, only about 62 percent of stays for non-M/SUD conditions had a home or self-care discharge disposition.

Only 1.0–1.6 percent of hospital stays with a principal diagnosis of mood disorders or schizophrenia had a discharge disposition of home health care compared with 14.1 percent of non-M/SUD stays.

Hospital readmissions for mood disorders and schizophrenia, 2012
Table 2 presents the percentage of readmissions and average costs for initial stays and readmissions after an initial hospitalization with a principal diagnosis of mood disorders or schizophrenia in 2012. Readmissions are categorized based on whether the principal or secondary diagnoses for the readmission included the same principal diagnosis as the initial stay. A comparison is provided for all other hospital stays that were unrelated to an M/SUD condition, excluding maternal and neonatal stays.

Table 2. Readmissions within 30 days after hospitalization for mood disorders and schizophrenia, 2012

Characteristic	Initial stay, principal diagnosis		
	Mood disorders	Schizophrenia	All other non-M/SUD conditions
Readmissions within 30 days, %			
Readmissions with the same condition as a principal diagnosis	9.0	15.7	3.8
Readmissions with the same condition as a principal or secondary diagnosis	12.6	18.6	8.7
Readmissions for any cause	15.0	22.4	15.4
Average costs per stay, $			
Initial hospital stay	5,800	8,800	12,600
Readmissions with the same condition as a principal diagnosis	6,500	8,600	13,600
Readmissions with the same condition as a principal or secondary diagnosis	7,100	8,800	14,600
Readmissions for any cause	7,200	8,600	13,800

Abbreviation: M/SUD, mental or substance use disorder

Note: Categorization of hospital stays was based on the principal diagnosis using Clinical Classifications Software (CCS) as the determining reason for the hospitalization: mood disorders, schizophrenia and other psychotic disorders, or other non-M/SUD conditions, which excluded stays with a principal diagnosis indicating the reason for the visit was maternal or neonatal or an M/SUD. Patients under age 1 year were excluded from the analysis because of limited availability of patient linkage numbers.

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), weighted national estimates from a readmissions analysis file derived from the State Inpatient Databases (SID), 2012

- **Hospital stays for mood disorders or schizophrenia were more likely to be followed by readmission involving those same conditions compared with stays for non-M/SUD conditions.**

  Patients admitted for mood disorders were more than twice as likely to return to the hospital within 30 days for the same principal diagnosis, compared with those with an initial stay for a non-M/SUD condition (9.0 vs. 3.8 percent). Similarly, when the definition of readmission was expanded to include mood disorders as either a principal or a secondary diagnosis, 12.6 percent of patients experienced a readmission within 30 days—46 percent higher than for non-M/SUD stays (8.7 percent).

  Among patients with an initial hospital stay for schizophrenia, the 30-day readmission rate was over four times higher than for a non-M/SUD condition (15.7 vs. 3.8 percent), when only stays with a principal diagnosis of schizophrenia are counted. When the definition of readmissions was expanded to include stays with schizophrenia as a principal or secondary diagnosis, 18.6 percent of patients experienced a 30-day readmission—115 percent higher than for non-M/SUD stays (8.7 percent).

  Considering any cause of readmission, patients with an initial hospital stay for schizophrenia were more likely to be readmitted to the hospital within 30 days (22.4 percent) than were patients with an initial stay for either mood disorders (15.0 percent) or other non-M/SUD conditions (15.4 percent).

- **For both initial hospital stays and readmissions, the average costs per stay were lower for mood disorders and schizophrenia than for non-M/SUD conditions.**

  The average costs of initial hospital stays for mood disorders and subsequent readmissions were approximately 50 percent lower than for non-M/SUD conditions. Similarly, average hospital costs for initial stays for schizophrenia and subsequent readmissions were approximately 35 percent lower than for non-M/SUD conditions. For example, average costs for 30-day readmissions for any cause were $7,200 for mood disorders and $8,600 for schizophrenia versus $13,800 for non-M/SUD conditions.

- **For mood disorders, readmissions involving mood disorders and readmissions for any cause were more expensive than initial hospital stays.**

  Compared with initial hospital stays for mood disorders, average hospital costs were higher for readmissions involving mood disorders and readmissions for any cause ($7,100 and $7,200, respectively, vs. $5,800).

Most common reasons for readmission after hospitalization for mood disorders and schizophrenia, 2012
Table 3 presents the five most frequent reasons for all-cause 30-day readmission after an initial hospitalization for mood disorders or schizophrenia in 2012.

Table 3. Most common principal diagnosis for all-cause 30-day readmissions among patients with a principal diagnosis of mood disorders or schizophrenia at initial admission, 2012

Principal diagnosis at 30-day readmission	Rank	Readmissions for any cause, %
Mood disorders as principal diagnosis at initial admission		
Mood disorders	1	60.1
Schizophrenia	2	9.0
Alcohol-related disorders	3	3.4
Substance-related disorders	4	3.1
Poisoning by psychotropic agents	5	1.4
Schizophrenia as principal diagnosis at initial admission		
Schizophrenia	1	70.3
Mood disorders	2	11.3
Substance-related disorders	3	1.4
Alcohol-related disorders	4	1.1
Fluid and electrolyte disorders	5	0.6

Note: Hospital stays were identified based on the principal diagnosis using Clinical Classifications Software (CCS). The principal diagnosis for readmissions also was identified using CCS categories. Patients under age 1 year were excluded from the analysis because of limited availability of patient linkage numbers.

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), weighted national estimates from a readmissions analysis file derived from the State Inpatient Databases (SID), 2012

- **After an initial hospital stay for mood disorders, the four most common reasons for readmission involved mood disorders or another type of M/SUD diagnosis.**

  For patients with an initial hospital stay for mood disorders, 60.1 percent had a principal diagnosis of mood disorders on readmission. The remaining top four principal diagnoses for readmission after an initial stay for mood disorders were other M/SUD conditions (schizophrenia or substance- or alcohol-related disorders) or poisoning by psychotropic agents.

- **After an initial hospital stay for schizophrenia, the four most common reasons for readmission involved schizophrenia or another type of M/SUD diagnosis.**

  For patients with an initial hospital stay for schizophrenia, 70.3 percent had a principal diagnosis of schizophrenia on readmission. The remaining top four principal diagnoses for readmission after an initial stay for schizophrenia were other M/SUD conditions (mood disorders or substance- or alcohol-related disorders) or fluid and electrolyte disorders.

Patient characteristics of readmissions after hospital stays for mood disorders and schizophrenia, 2012
Among initial hospital stays in 2012 with a principal diagnosis of mood disorders, 12.6 percent were followed by readmissions with mood disorders as either a principal or secondary diagnosis within 30 days. Figure 1 presents the percentage of 30-day readmissions with mood disorders as either a principal or secondary diagnosis after an initial hospitalization for mood disorders, by select patient characteristics in 2012.

Figure 1. Percentage of 30-day readmissions involving mood disorders after an initial stay for mood disorders, by patient characteristics, 2012
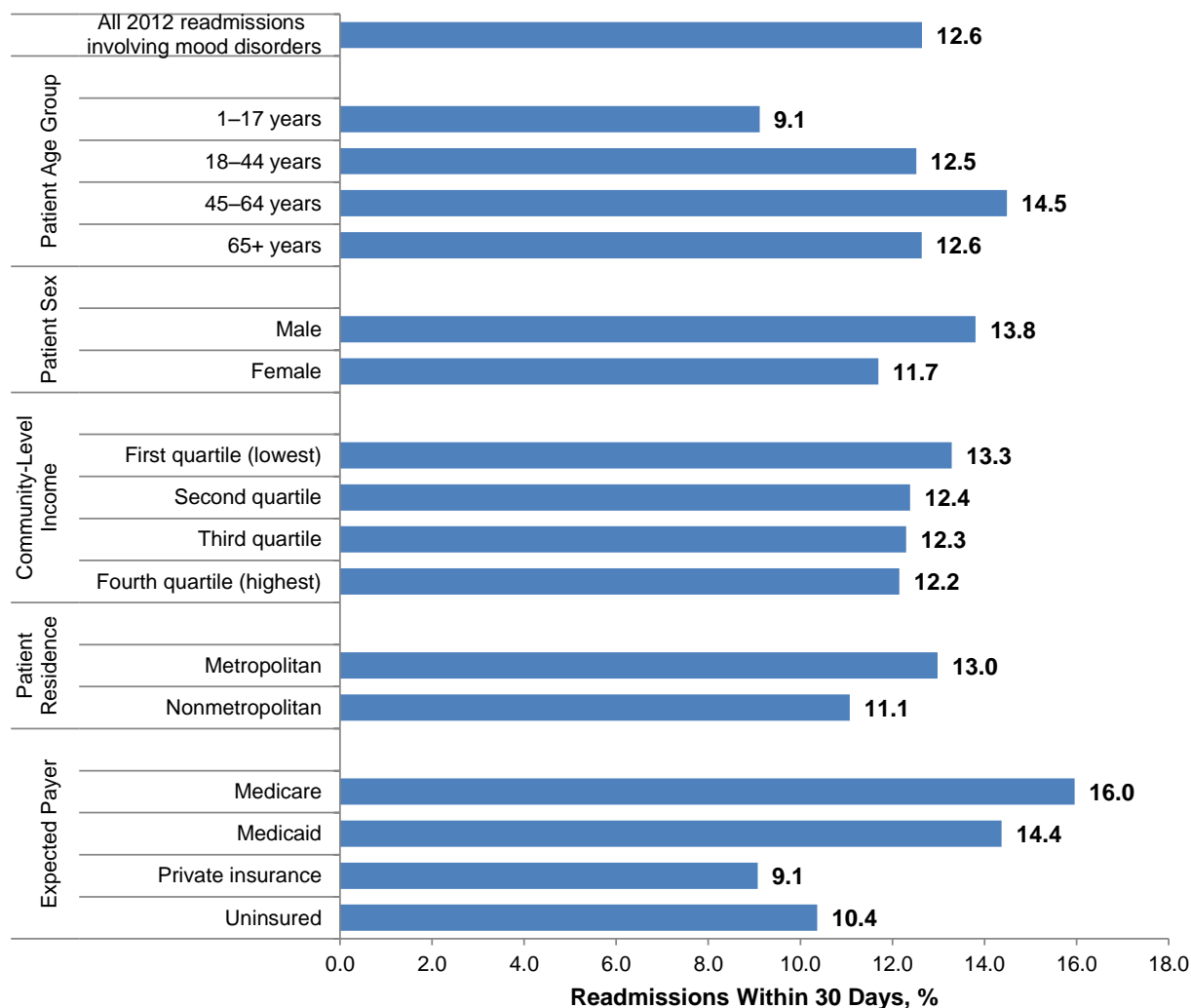
Note: Hospital stays for mood disorders were identified using Clinical Classifications Software (CCS). Readmissions involving mood disorders included those with either a principal or secondary diagnosis of mood disorders. Patients under age 1 year were excluded from the analysis because of limited availability of patient linkage numbers.

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), weighted national estimates from a readmissions analysis file derived from the State Inpatient Databases (SID), 2012

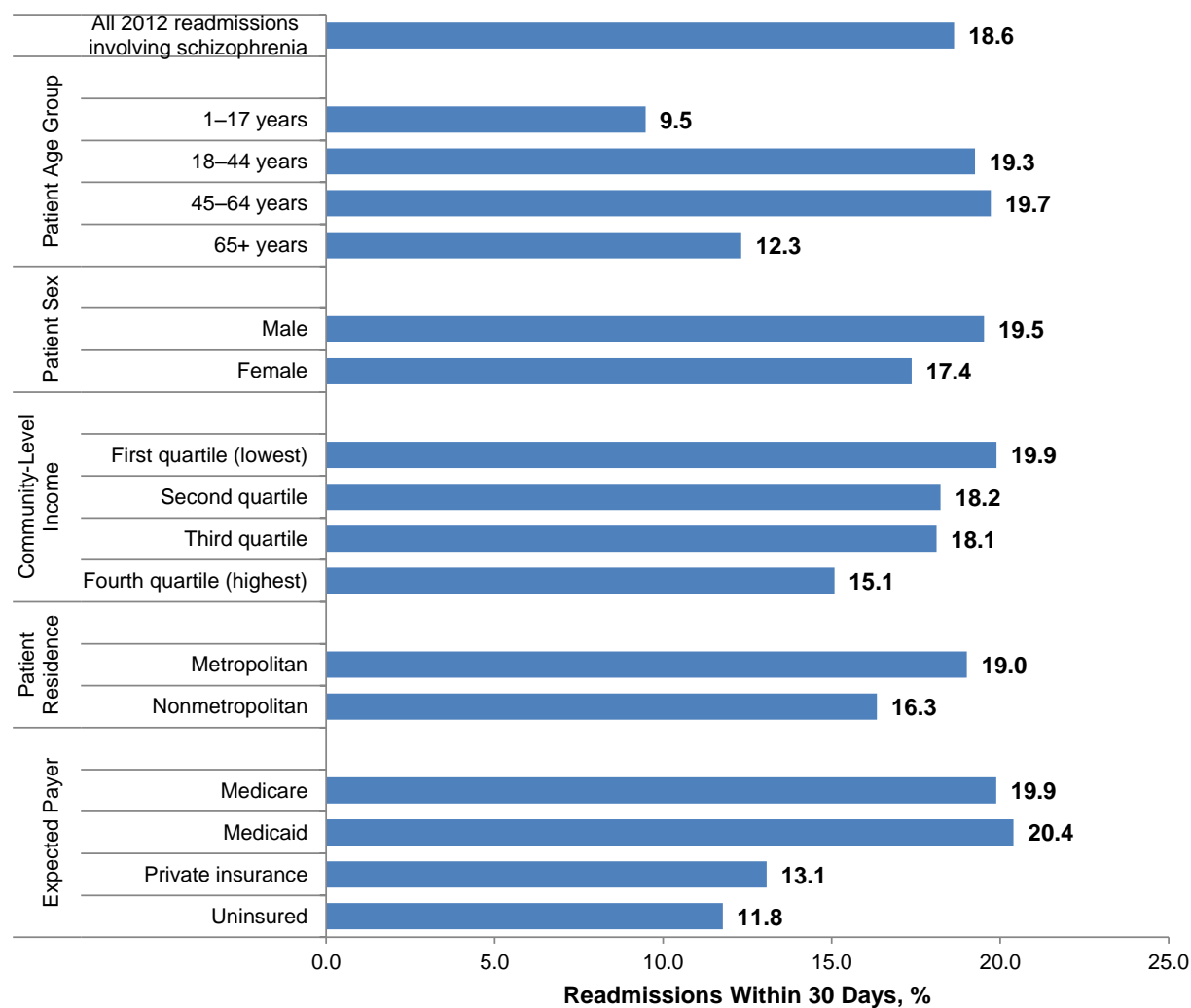■ **Readmissions involving mood disorders were more common among adults than among children.**

After an initial hospital stay for mood disorders, adults aged 18 years and older were more likely to have a 30-day readmission with mood disorders as either a principal or a secondary diagnosis (12.5–14.5 percent, depending on adult age group) than were children aged 17 years and younger (9.1 percent).

- **Patients covered by Medicare or Medicaid had a higher rate of readmission involving mood disorders than did those who were privately insured or uninsured.**

  After an initial hospitalization for mood disorders, Medicare and Medicaid patients were more likely to have a 30-day readmission with mood disorders (16.0 and 14.4 percent, respectively) than were privately insured or uninsured patients (9.1 and 10.4 percent, respectively).

Among initial hospital stays in 2012 with a principal diagnosis of schizophrenia, 18.6 percent were followed by readmissions with schizophrenia as either a principal or a secondary diagnosis within 30 days. Figure 2 presents the percentage of 30-day readmissions with schizophrenia as either a principal or a secondary diagnosis after an initial hospitalization for schizophrenia, by select patient characteristics in 2012.

Figure 2. Percentage of 30-day readmissions involving schizophrenia after an initial stay for schizophrenia, by patient characteristics, 2012

Characteristic	Readmissions Within 30 Days, %
All 2012 readmissions involving schizophrenia	18.6
Patient Age Group	
1–17 years	9.5
18–44 years	19.3
45–64 years	19.7
65+ years	12.3
Patient Sex	
Male	19.5
Female	17.4
Community-Level Income	
First quartile (lowest)	19.9
Second quartile	18.2
Third quartile	18.1
Fourth quartile (highest)	15.1
Patient Residence	
Metropolitan	19.0
Nonmetropolitan	16.3
Expected Payer	
Medicare	19.9
Medicaid	20.4
Private insurance	13.1
Uninsured	11.8

Note: Hospital stays for schizophrenia were identified using Clinical Classifications Software (CCS). Readmissions involving schizophrenia included those with either a principal or a secondary diagnosis of schizophrenia and other psychotic disorders. Patients under age 1 year were excluded from the analysis because of limited availability of patient linkage numbers.

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), weighted national estimates from a readmissions analysis file derived from the State Inpatient Databases (SID), 2012

- **Readmissions involving schizophrenia were more common among adults aged 18–64 years than among children or adults aged 65 years and older.**

  After an initial hospitalization for schizophrenia, adults aged 18–64 years were more likely to have a 30-day readmission with schizophrenia as either a principal or a secondary diagnosis (approximately 20 percent) than were either children aged 17 years and younger (9.5 percent) or adults aged 65 years and older (12.3 percent).

- **Patients residing in the lowest income communities had a higher rate of readmission with schizophrenia compared with patients residing in the highest income communities.**

  After an initial hospital stay for schizophrenia, patients from the lowest income communities were more likely to have a 30-day readmission with schizophrenia (19.9 percent) than were patients from the highest income communities (15.1 percent).

- **Patients covered by Medicare or Medicaid had a higher rate of readmission with schizophrenia than did those who were privately insured or uninsured.**

  After an initial hospitalization for schizophrenia, Medicare and Medicaid patients were more likely to have a 30-day readmission with schizophrenia (19.9 and 20.4 percent, respectively) than were privately insured or uninsured patients (13.1 and 11.8 percent, respectively).

Data Source

The estimates in this Statistical Brief are based upon data from the Healthcare Cost and Utilization Project (HCUP) 2012 State Inpatient Databases (SID) and the 2012 National Inpatient Sample (NIS). The SID were used to create a readmissions analysis file weighted for national estimates. Most of the statistics were generated from HCUPnet, a free, online query system that provides users with *immediate access* to the largest set of publicly available, all-payer national, regional, and State-level hospital care databases from HCUP.[9] The non-M/SUD comparison group statistics were calculated using the 2012 readmissions analysis file and NIS. Patients under age 1 year were excluded from the readmissions analysis file because of limited availability of patient linkage numbers.

It is important to note that the estimates provided in this Statistical Brief are based on two separate datasets and cannot be combined. The overall characteristics of hospital stays provided in Table 1 use the 2012 NIS, which provides weighted national estimates based on 44 states. Initial hospital stays and readmissions are included in the reported statistics based on the 2012 NIS. The readmission results reported in Tables 2 and 3 and Figures 1 and 2 use the 2012 readmissions analysis file, which provides weighted national estimates based on 18 states. Statistics for initial hospital stays and readmissions from the 2012 readmissions analysis file are reported separately.

Definitions

Diagnoses, 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 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.[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
For this report, mood disorders and schizophrenia were defined using the following CCS diagnosis categories for the principal diagnosis:
- CCS 657: mood disorders
- CCS 659: schizophrenia and other psychotic disorders

The non-M/SUD (mental and substance use disorder) conditions comparison group included all hospital stays except the following:
- Maternal and neonatal stays—the clinical coding criteria for identifying and excluding maternal and neonatal stays are listed in Table 5. Maternal and neonatal stays were excluded from the comparison group because they represent a fundamentally different clinical population than those hospitalized for other reasons (e.g., medical, surgical, injury, or mental health).
- M/SUD stays—stays with any of the following CCS principal diagnosis categories:
  - CCS 650: adjustment disorders
  - CCS 651: anxiety disorders
  - CCS 652: attention-deficit, conduct, and disruptive behavior disorders
  - CCS 655: disorders usually diagnosed in infancy, childhood, or adolescence

[9] Agency for Healthcare Research and Quality. HCUPnet Web site. http://hcupnet.ahrq.gov/. Accessed March 13, 2015.
[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 November 2014. http://www.hcup-us.ahrq.gov/toolssoftware/ccs/ccs.jsp. Accessed January 7, 2015.

- o CCS 656: impulse control disorders, NEC
- o CCS 657: mood disorders
- o CCS 658: personality disorders
- o CCS 659: schizophrenia and other psychotic disorders
- o CCS 660: alcohol-related disorders
- o CCS 661: substance-related disorders
- o CCS 662: suicide and intentional self-inflicted injury
- o CCS 663: screening and history of mental health and substance abuse codes
- o CCS 670: miscellaneous disorders

Note: Although dementia (CCS=653) and intellectual disability/developmental disorders (CCS=654) are listed in the Diagnostic and Statistical Manual of Mental Disorders Fifth Edition, these diagnoses, which frequently are characterized by the development of multiple cognitive impairments related to medical conditions, often require more medical than psychiatric treatment and thus were not excluded from the analysis.

Table 4. Clinical coding criteria for identifying and excluding maternal and neonatal hospital stays from the analysis.

Maternal and neonatal

Maternal and neonatal stays are defined using the following CCS <u>principal</u> diagnosis categories:

Maternal
- 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
- 194: Forceps delivery
- 195: Other complications of birth; puerperium affecting management of mother
- 196: Normal pregnancy and/or delivery

Neonatal
- 218: Liveborn
- 219: Short gestation; low birth weight; and fetal growth retardation
- 220: Intrauterine hypoxia and birth asphyxia
- 221: Respiratory distress syndrome
- 222: Hemolytic jaundice and perinatal jaundice
- 223: Birth trauma
- 224: Other perinatal conditions

Abbreviations: OB, obstetric; C-section, cesarean section

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 psychiatric or chemical dependency conditions in a community hospital, the discharge record for that stay was included in the analysis.

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 psychiatric or chemical dependency conditions 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.

Readmissions
The 30-day readmission rate is defined as the number of admissions for each condition for which there was at least one subsequent hospital admission within 30 days, divided by the total number of admissions from January through November 2012. That is, when patients are discharged from the hospital, they are followed for 30 days in the data. If any readmission to the same or different hospital occurs during this time period, the admission is counted as having a readmission. No more than one readmission is counted within the 30-day period, because the outcome measure assessed is "percentage of admissions that are readmitted." If a patient was transferred to a different hospital on the same day or was transferred within the same hospital, the two events were combined as a single stay and the second event was not counted as a readmission; that is, transfers were not considered a readmission. In the case of admissions for which there was more than one readmission in the 30-day period, the data presented in this Statistical Brief reflect the characteristics and costs of the first readmission.

Every qualifying hospital stay is counted as a separate initial (starting point) admission. Thus, a single patient can be counted multiple times during the course of the January through November observation period. In addition, initial admissions do not require a prior "clean period" with no hospitalizations; that is, a hospital stay may be a readmission for a prior stay and the initial admission for a subsequent readmission. Admissions were disqualified from the analysis as initial admissions if they could not be followed for 30 days for one of the following reasons: (1) admissions in which the patient died in the hospital, (2) admissions missing information on length of stay, and (3) admissions discharged in December 2012.

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).[11] *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. For the purposes of this Statistical Brief, costs are 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 the Centers for Medicare & Medicaid Services (CMS).[12] 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.[13]

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[11] 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 January 7, 2015.
[12] 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 January 7, 2015.
[13] 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 January 7, 2015.

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.

Location of patients' residence
Place of residence is based on the Urban Influence Codes (UIC), which emphasize the relationship of outlying counties to major metropolitan areas.[14] Discharges are classified into one of two categories based on the county of the patient's residence:
- Metropolitan: includes large metropolitan areas with at least 1 million residents and small metropolitan areas with less than 1 million residents
- Nonmetropolitan: all other areas not included under metropolitan

Median community-level income
Median community-level income is the median household income of the patient's ZIP Code of residence. The cut-offs for the quartile designation are determined using ZIP Code demographic data obtained from the Nielsen Company. The income quartile is missing for patients who are homeless or foreign.

Payer
Payer is the expected payer for the hospital stay. To make coding uniform across all HCUP data sources, payer combines detailed categories into general groups:
- Medicare: includes patients covered by fee-for-service and managed care Medicare
- Medicaid: includes patients covered by fee-for-service and managed care Medicaid
- Private Insurance: includes Blue Cross, commercial carriers, and private health maintenance organizations (HMOs) and preferred provider organizations (PPOs)
- Uninsured: includes an insurance status of *self-pay* and *no charge*
- Other: includes Worker's Compensation, TRICARE/CHAMPUS, CHAMPVA, Title V, and other government programs.

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

For this Statistical Brief, a hierarchy was used to assign the payer category based on the primary and secondary expected payer:

- If the primary or secondary expected payer indicates Medicare, then the payer category is assigned to Medicare. This categorization includes patients who are dually eligible for Medicare and Medicaid under Medicare.
- If not Medicare and the primary or secondary expected payer indicates Medicaid, then the payer category is Medicaid.
- If not Medicare or Medicaid and the primary or secondary expected payer indicates private insurance, then the payer category is private.

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[14] UIC were developed at the U.S. Department of Agriculture's Economic Research Service, as a refinement of the Office of Management and Budget (OMB) Metropolitan Statistical Area (MSA) definition. Additional information about the UIC classification scheme is available at http://www.ers.usda.gov/topics/rural-economy-population/rural-classifications.aspx#.U4S5mXYRLTo. Accessed March 18, 2015.

- If not Medicare, Medicaid, or private and the primary expected payer indicates self-pay or no charge, then the payer category is uninsured.
- Stays for other types of payers are not reported in this Statistical Brief because this is a mixed payer group and small numbers.

For this Statistical Brief, categorization of readmission counts by expected payer was based on the index stay.

Discharge status
Discharge status reflects the disposition of the patient at discharge from the hospital and includes the following six categories: routine (to home); transfer to another short-term hospital; other transfers (including skilled nursing facility, intermediate care, and another type of facility such as a nursing home); home health care; against medical advice (AMA); or died in the hospital.

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 NIS

The HCUP National (Nationwide) Inpatient Sample (NIS) is a national (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 is a sample of hospitals and includes all patients from each hospital, regardless of payer. 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.

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

- Revisions to the sample design—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.

- 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.

About HCUPnet

HCUPnet is an online query system that offers instant access to the largest set of all-payer health care databases that are publicly available. HCUPnet has an easy step-by-step query system that creates tables and graphs of national and regional statistics as well as data trends for community hospitals in the United States. HCUPnet generates statistics using data from HCUP's National (Nationwide) Inpatient Sample (NIS), the Kids' Inpatient Database (KID), the Nationwide Emergency Department Sample (NEDS), the State Inpatient Databases (SID), and the State Emergency Department Databases (SEDD).

For More Information

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

For additional HCUP statistics, visit HCUPnet, our interactive query system, at http://hcupnet.ahrq.gov/.

For information on readmissions-related topics, refer to the following HCUP Statistical Briefs located at http://www.hcup-us.ahrq.gov/reports/statbriefs/statbriefs.jsp:

- Statistical Brief #184, Characteristics of Hospital Stays for Nonelderly Medicaid Super-Utilizers, 2012
- Statistical Brief #172, Conditions With the Largest Number of Adult Hospital Readmissions by Payer, 2011
- Statistical Brief #127, 30-Day Readmissions following Hospitalizations for Chronic vs. Acute Conditions, 2008
- Statistical Brief #115, All-Cause Readmissions by Payer and Age, 2008
- Statistical Brief #89, All-Cause Hospital Readmissions among Non-Elderly Medicaid Patients, 2007

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

- Statistical Brief #180, Overview of Hospital Stays in the United States, 2012
- Statistical Brief #181, Costs for Hospital Stays in the United States, 2012
- Statistical Brief #186, Most Frequent Operating Room Procedures Performed in U.S. Hospitals, 2003–2012
- Statistical Brief #162, Most Frequent Conditions in U.S. Hospitals, 2011

For a detailed description of HCUP and more information on the design of the National 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 2014. http://www.hcup-us.ahrq.gov/nisoverview.jsp. Accessed January 7, 2015.

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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:

Virginia Mackay-Smith, Acting Director
Center for Delivery, Organization, and Markets
Agency for Healthcare Research and Quality
540 Gaither Road
Rockville, MD 20850