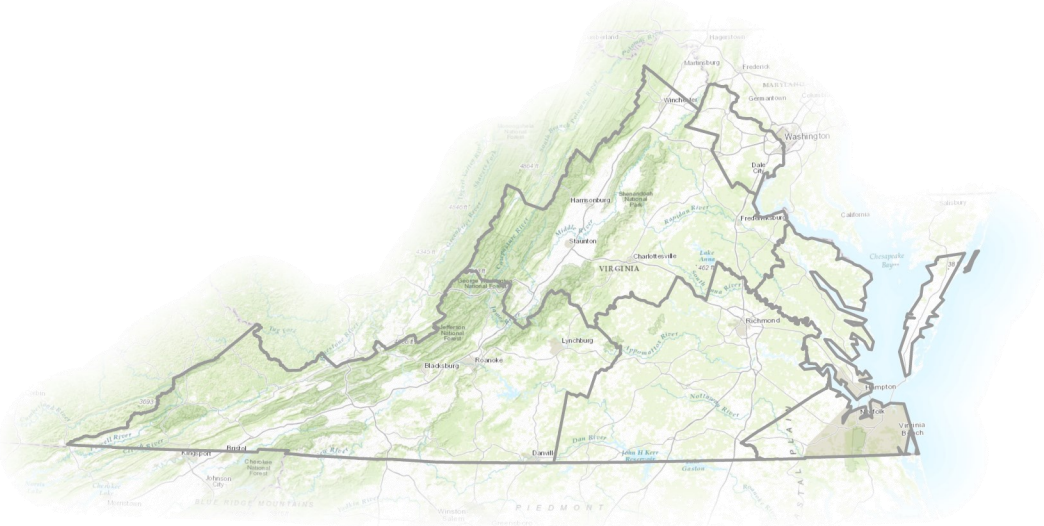
Inpatient Hospital Utilization in the Commonwealth of Virginia

2016 Data Analysis

SCHROEDER CENTER FOR HEALTH POLICY
WILLIAM & MARY

DECEMBER 2017



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ABOUT THIS REPORT

In Virginia, dozens of short-term general hospitals, critical access hospitals, and children's hospitals provide inpatient acute care to Virginia residents and visitors to the state. The purpose of this report is to provide a detailed description of the inpatient care provided during nearly 844,000 hospitalizations in 2016. The primary data source is patient level data from Virginia Health Information (VHI, 2017). These data include information on all discharges occurring at licensed hospitals in Virginia.

This report describes the demographic traits of patients hospitalized in Virginia, their admission types, and the conditions for which they were treated. In addition, data pertaining to patients' discharge status and length of stay are presented along with information on billable charges and the primary source of payment for inpatient hospital care. This report also provides statistical summaries of inpatient hospital stays by the geographic locations of hospitals and patients.

Report findings include that in 2016, inpatient hospitalizations at Virginia community hospitals account for $33.2 billion in total charges. Adults between the ages of 65 and 84 represent the single largest age group of patients discharged from Virginia's hospitals. Nearly 52% of all non-obstetric hospitalizations are for females, and just under 64% of all hospitalizations are for white, non-Hispanic patients. The most common conditions responsible for inpatient hospitalizations are childbirth, septicemia, and osteoarthritis. These three conditions alone account for nearly 21% of all hospitalizations in 2016. Medicare is the primary payer for 40% of discharges, and private insurance is the primary payer for 34% of discharges. Nearly 90% of all hospitalizations occur at urban hospitals, which have, on average, longer lengths of stay and charges per stay compared to hospitalizations at rural hospitals.

Source:

Virginia Health Information (VHI). (2017). "Patient Level Data." Richmond, VA. Accessed fall 2017.

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INTRODUCTION

Overview of Virginia's Hospitals

Currently, there are 103 hospitals, excluding ambulatory surgical hospitals, located in Virginia (Exhibit 1).[1] Nearly 71% of these hospitals are acute care hospitals, where patients generally receive treatment for acute illnesses or conditions or for traumatic injuries. The remaining 29% of hospitals are categorized as critical access, long-term acute care, rehabilitation, children, and psychiatric hospitals.

Virginia is divided into five health planning regions: Central, Eastern, Northern, Northwest, and Southwest. Over 51% of the 103 hospitals in Virginia are located in the Eastern and Southwest regions (Exhibit 1). The Central, Northern, and Northwest regions account for 18%, 14%, and 18%, respectively, of hospitals in the state.

EXHIBIT 1. Virginia Hospitals by Facility Type and Health Planning Region, 2016

	Health Planning Region					
Facility Type	**Central**	**Eastern**	**Northern**	**Northwest**	**Southwest**	**TOTAL**
Acute	13	17	11	11	21	73
Critical access	-	1	-	4	3	8
Long-term acute care	-	3	-	1	1	5
Rehabilitation	4	1	1	2	1	9
Children	-	1	-	-	-	1
Psychiatric	1	3	2	-	1	7
TOTAL	**18**	**26**	**14**	**18**	**27**	**103**

SOURCE: Schroeder Center for Health Policy analysis of hospital discharge data obtained from Virginia Health Information, 2016 Patient Level Data. Exhibit excludes ambulatory surgical hospitals.

Overview of Virginia's Population

Although Virginia's hospitals treat patients who do not live in the state, the vast majority of patients who receive treatment are Virginia residents. In 2016, the Virginia population totaled over 8.4 million people. A slightly higher percentage of residents were female (51%), and the majority of residents were white (70%) (Exhibit 2). Compared to the population of the United States, Virginia's population has a greater share of black residents (20% vs. 13%). Sixty-three percent of Virginia residents are between the ages of 18 and 64. Twenty-two percent of the population consists of children and youth age 17 and under, and 15% is comprised of adults age 65 and over. This is similar to the age distribution of the United States.

[1] Schroeder Center for Health Policy analysis of hospital discharge data obtained from Virginia Health Information, 2016 Patient Level Data.

EXHIBIT 2. Population Statistics for the United States and Virginia, 2016

	United States		Virginia	
	Number	Percent	Number	Percent
Population	323,127,513	100.0%	8,411,808	100.0%
Sex				
Female	164,148,777	50.8%	4,273,198	50.8%
Male	158,978,736	49.2%	4,138,610	49.2%
Race/Ethnicity				
White	248,485,057	76.9%	5,888,266	70.0%
Black	42,975,959	13.3%	1,665,538	19.8%
American Indian	4,200,658	1.3%	42,059	.5%
Asian	18,418,268	5.7%	555,179	6.6%
Other Race	9,047,571	2.8%	252,354	3.0%
Unknown			8,412	.1%
Age (years)				
≤ 17	73,673,073	22.8%	1,867,421	22.2%
18 to 64	200,339,058	62.0%	5,316,263	63.2%
65 ≥	49,115,382	15.2%	1,228,124	14.6%

NOTE: Hispanics may be of any race, and for purposes of this exhibit are included among the applicable race categories.

SOURCE: U.S. Census Bureau, QuickFacts: Virginia; United States (2016). Accessed 11/29/17.

Data Sources and Samples

Several data sources and tools were used to prepare this report (Exhibit 3). The primary data source is patient level discharge data obtained from Virginia Health Information (VHI), whose mission is to create and disseminate healthcare information in Virginia.[2] The patient level data includes information on hospital discharges from licensed hospitals in the state, including information on patient demographic traits, primary and secondary diagnoses, and the billable charges associated with the hospital stay,[3] among other types of information.

[2] Virginia Health Information, "About Us." Accessed 11/8/17.

[3] Hospital billed charges are list prices and do not represent a hospital's expected remuneration for services offered. Health insurers and public programs remunerate hospitals at negotiated rates that are typically less than the hospital's billed charge.

EXHIBIT 3. Data Sources

Patient Level Data (Discharge Data)
Virginia Health Information, Patient Level Data, 2016. Virginia Health Information (VHI) has provided non-confidential patient level information used in this report which it has compiled in accordance with Virginia law but which it has no authority to independently verify. By using this report, the user agrees to assume all risks that may be associated with or arise from the use of inaccurate data. VHI cannot and does not represent that the use of VHI's data was appropriate for this report or endorse or support any conclusions or inferences that may be drawn from the use of VHI's data.

State and Locality Population Estimates (U.S. and Virginia Population Data)
U.S. Census Bureau, QuickFacts: Population Estimates for Virginia and the U.S., 2016; University of Virginia, Weldon Cooper Center for Public Service, Demographics Research Group, "Virginia Population Estimates: 2016," 2017.

Clinical Classifications Software
Agency for Healthcare Research and Quality, Healthcare Cost and Utilization Project, Clinical Classifications Software (CCS) for ICD-10-CM/PCS.

Chronic Condition Indicator
Agency for Healthcare Research and Quality, Healthcare Cost and Utilization Project, Chronic Condition Indicator (CCI) for ICD-10-CM/PCS.

Health Planning Regions
Virginia Department of Health, "Health Planning Regions in Virginia" and "Location of Counties and Selected Cities in Virginia."

Rural and Urban Hospitals
Virginia Health Information, "Hospital Operating and Total Margins: Location per CMS POS File and FY Final Rule Correction Notices," 2016. Accessed by clicking "Click here (Excel)" at this VHI website.

Hospitals Analyzed in This Report

The report focuses on patient discharges from Virginia community hospitals in 2016. For the purpose of this report, community hospitals are defined as acute care hospitals, critical access hospitals, and children's hospitals. A total of 82 such hospitals were included in the VHI data in 2016.[4] Excluded from the analysis are long-term care facilities such as rehabilitation, psychiatric, and long-term acute care hospitals as well as ambulatory facilities. In this way, this analysis is similar to reports completed by the Agency for Healthcare Research and Quality using the HCUP State Inpatient Databases.[5]

[4] The 2015 report examined patient level data for 81 community hospitals. In 2016, data were examined for 82 community hospitals, with the addition of StoneSprings Hospital Center which opened in December 2015 and is located in the Northern health planning region.
[5] See, for example: Heslin, K.C. and Weiss, A.J. (2015). "Hospital Readmissions Involving Psychiatric Disorders, 2012." HCUP Statistical Brief #189. Agency for Healthcare Research and Quality. Accessed 11/8/17.

The three types of hospitals included in our definition of community hospitals are defined as follows by VHI:[6]

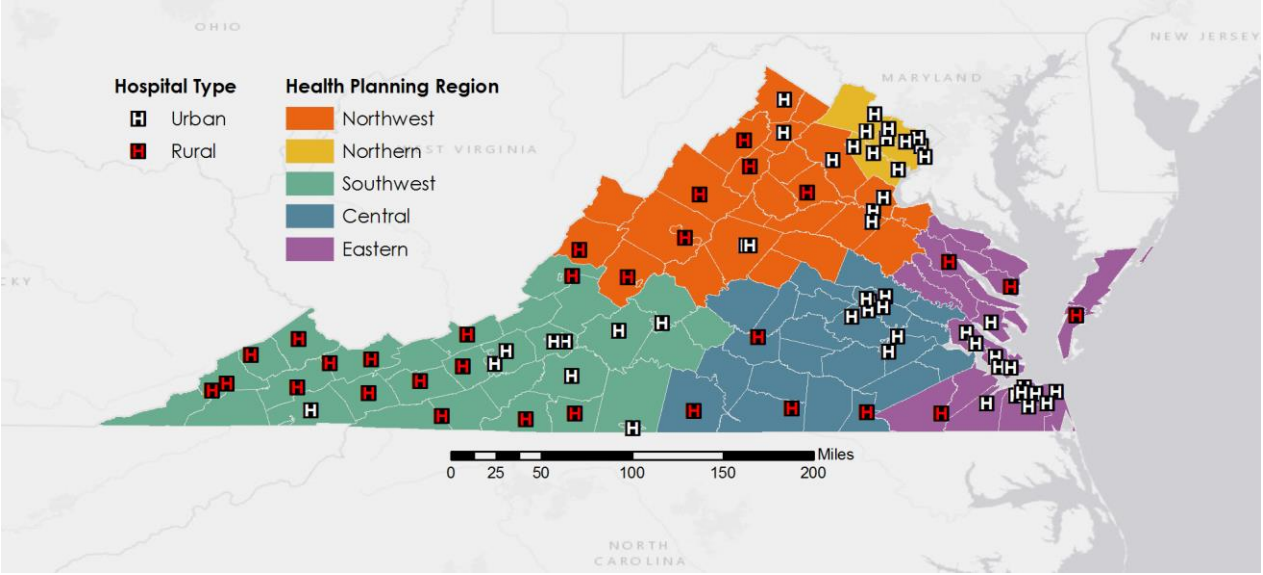
- **Acute** – "Hospitals delivering care to patients with acute illness or trauma. Acute care generally occurs in a hospital or emergency room setting."

- **Critical Access** – "A hospital operating no more than 25 beds with no more than 15 used for acute inpatient care at any one time with a maximum stay of 96 hours."

- **Children** – "A specialized hospital that provides long-term rehabilitation and specialty care services for children."

These hospitals are located around the state, in all health planning regions, and in both rural and urban locations (Exhibit 4).

EXHIBIT 4. Map of Virginia's Urban and Rural Hospitals by Health Planning Region, 2016



SOURCES: Schroeder Center for Health Policy analysis of hospital discharge data obtained from Virginia Health Information, 2016 Patient Level Data; U.S. Census Bureau, TIGER/Line Shapefiles and TIGER/Line Files, "TIGER/Line Shapefiles;" Virginia Health Information, "Hospital Operating and Total Margins: Location per CMS POS File and FY Final Rule Correction Notices." Accessed by clicking "Click here (Excel)" at this VHI website; ESRI, ArcGIS, "Light Gray Canvas;" Virginia Department of Health, "Health Planning Regions in Virginia" and "Location of Counties and Selected Cities in Virginia."

[6] Virginia Health Information, "Hospital Information." Accessed 11/8/17.

Patient Discharges Analyzed in This Report

This report focuses on discharges of both Virginia residents and non-residents who received inpatient care during 2016 at one of the 82 community hospitals defined above. The analysis uses one of three samples (Exhibit 5):

Main Sample – Unless otherwise stated, analysis is conducted on a sample of 843,588 inpatient discharges from 82 community hospitals in Virginia. Actual sample sizes may be smaller due to missing data on a particular trait associated with the hospitalization or the patient.

Main Sample Excluding Obstetric Discharges – Some analysis is based on a sample of discharges that excludes 197,131 obstetric-related discharges, resulting in a sample of 646,457 discharges. Obstetric-related discharges fall into two categories:

- Neonatal discharges, defined as discharges where the age at admission is between 0 and 28 days and the admission type is newborn, or where the age at admission is between 0 and 28 days and the major diagnostic category is classified as "newborn/neonatal."
- Maternal/pregnancy-related discharges, defined as discharges where the major diagnostic category is classified as "pregnancy, childbirth or puerperium."

Maternal Discharges Only – Some analysis focuses only on maternal or pregnancy-related discharges, as defined above.

EXHIBIT 5. Summary of Inpatient Discharge Samples Used

Main Sample	Main Sample Excluding Obstetric Discharges	Maternal Discharges Only
Total Discharges: 868,945	**Total Eligible Discharges**: 843,588	**Total Eligible Discharges**: 843,588
Excluded from Analysis: 25,357 Discharges from Specialty Hospitals	**Excluded from Analysis:** 197,131 Obstetric Discharges	**Excluded from Analysis:** 743,516 Non-Maternal Discharges
Total Eligible Discharges Remaining: 843,588	**Total Eligible Discharges Excluding Obstetric Discharges**: 646,457	**Total Maternal Discharge Sample:** 100,072

See the Appendix for additional definitions used in the analysis.

DEMOGRAPHIC CHARACTERISTICS OF PATIENTS HOSPITALIZED IN VIRGINIA

DEMOGRAPHIC CHARACTERISTICS: Patient Age, Sex, and Race/Ethnicity

Patient Age

Adults between the ages of 65 and 84 represent the single largest group of patients admitted to Virginia's hospitals, whether or not obstetric patients (mothers and newborns) are included (Exhibit 6). Among all discharges, for example, the 237,440 discharges of patients in this age group account for 28% of all discharges. The share in this age group rises to nearly 37% of all discharges when obstetric patients are excluded.

When patients are grouped by age into broader categories of youth ages 17 and under, adults age 18 to 64, and the elderly age 65 and over, adults age 18 to 64 account for the largest share of discharges at 49%. The next largest share is the elderly, at 36%, followed by persons under age 18, at 15%.

Patient Sex

Female patients account for a higher share of discharges than male patients, even when obstetric discharges are excluded (Exhibit 7). Nearly 52% of the 646,457 discharges in Virginia hospitals (excluding obstetric discharges) are for female patients.

Patient Race/Ethnicity

Of the 843,588 discharges in 2016, 86% were discharges of white non-Hispanic and black non-Hispanic patients (Exhibit 8). White non-Hispanic patients, at nearly 64% of all discharges, were the single largest racial/ethnic group. With obstetric patients excluded, the share of discharges accounted for by white non-Hispanic and black non-Hispanic patients rises to 92%, and the white non-Hispanic share increases to nearly 69%. The other four racial/ethnic categories account for only about 6% of non-obstetric discharges.

NOTES: Rate per 10,000 – Exhibit 7 includes the number of discharges per 10,000 people of each sex in Virginia.

SOURCES: Schroeder Center for Health Policy analysis of hospital discharge data obtained from Virginia Health Information, 2016 Patient Level Data; U.S. Census Bureau, QuickFacts: Population Estimates for Virginia and the U.S., 2016. Accessed 11/29/17.

EXHIBIT 6. Total Discharges by Patient Age

Patient Age (years)	All Discharges		Obstetric Discharges Excluded	
	Number	Percent	Number	Percent
Less than 1	102,361	12.1%	5,302	0.8%
1 to 17	23,471	2.8%	22,356	3.5%
18 to 44	208,297	24.7%	109,616	17.0%
45 to 64	206,277	24.5%	206,001	31.9%
65 to 84	237,440	28.1%	237,440	36.7%
85 and over	65,742	7.8%	65,742	10.2%
TOTAL	**843,588**	**100%**	**646,457**	**100%**

EXHIBIT 7. Total Discharges by Patient Sex

	All Discharges			Obstetric Discharges Excluded		
Patient Sex	Number	Percent	Rate per 10,000	Number	Percent	Rate per 10,000
Female	485,980	57.6%	1,137	338,296	52.3%	792
Male	357,550	42.4%	864	308,147	47.7%	745
Unknown	58	0.0%		14	0.0%	
TOTAL	**843,588**	**100%**		**646,457**	**100%**	

EXHIBIT 8. Total Discharges by Patient Race/Ethnicity

	All Discharges		Obstetric Discharges Excluded	
Patient Race	Number	Percent	Number	Percent
White non-Hispanic	537,103	63.7%	443,764	68.6%
Black non-Hispanic	189,470	22.5%	152,112	23.5%
Other race	35,544	4.2%	16,453	2.5%
Asian	26,581	3.2%	11,400	1.8%
American Indian	896	0.1%	679	0.1%
Hispanic, any race	15,053	1.8%	8,121	1.3%
Unknown	38,941	4.6%	13,928	2.2%
TOTAL	**843,588**	**100%**	**646,457**	**100%**

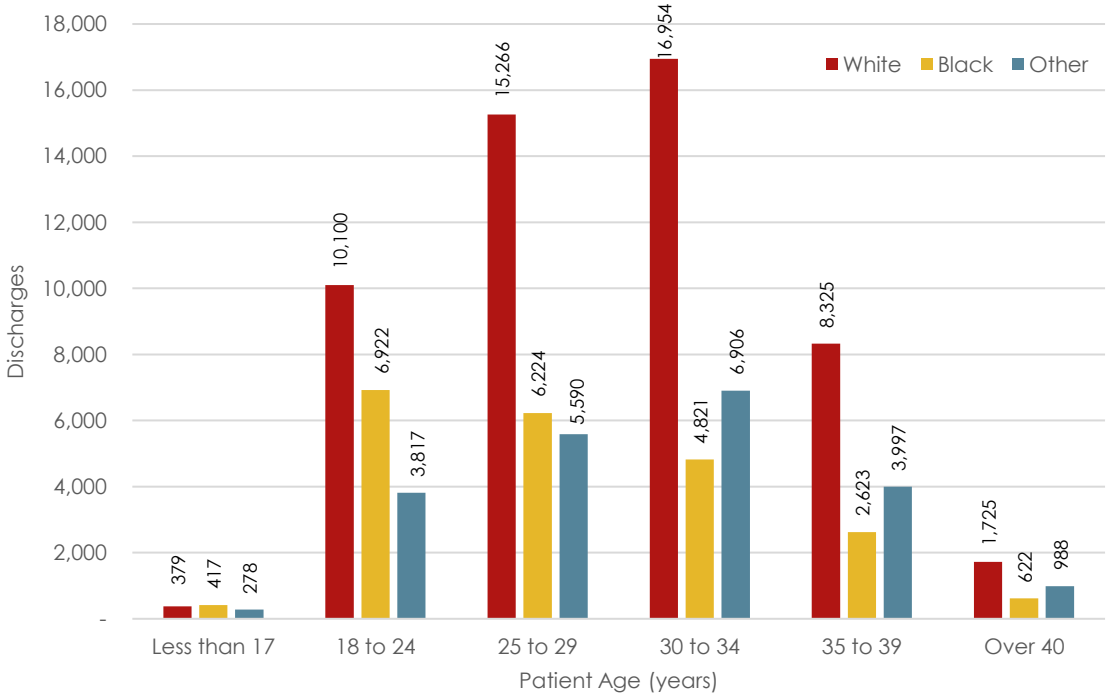
DEMOGRAPHIC CHARACTERISTICS: Maternal Discharges

Among maternal discharges, women between the ages of 30 and 34 account for the highest total number of discharges, and white non-Hispanic women have the largest share of discharges within each age group except for those youth age 17 or under (Exhibit 9). Most maternal stays by white non-Hispanic women and women of other races are for women between the ages of 30 and 34, while most maternal stays by black non-Hispanic women are for women between the ages of 18 and 24.

NOTES: Patient Race/Ethnicity -- Exhibit 9 simplifies race categories into three groups: white, black, and other (Asian, American Indian, Hispanic [any race], unknown, and other).

SOURCE: Schroeder Center for Health Policy analysis of hospital discharge data obtained from Virginia Health Information, 2016 Patient Level Data.

EXHIBIT 9. Total Maternal Discharges by Patient Age and Race/Ethnicity



NOTE: This sample includes a total of 95,954 maternal discharges for which race/ethnicity is known. 4,118 discharges of unknown race/ethnicity are excluded.

TYPE OF ADMISSION AND PATIENTS' SOURCES OF ENTRY INTO VIRGINIA'S HOSPITALS

TYPE OF HOSPITAL ADMISSION: Overall and by Age

Overall

Over half of all discharges (or 425,238 discharges) in Virginia's hospitals are emergency admissions, which are not necessarily limited to admissions from the emergency department (Exhibit 10). Another 17% (or 138,932 discharges) are elective admissions, and 21% of discharges (or 180,855 discharges) are for patients admitted on an urgent basis.

Age

In all three broad age ranges, emergency admissions account for the largest share of hospital discharges (Exhibit 11). This is especially the case among elderly patients ages 65 and over; nearly 70% of discharges in this age group are emergency admissions. The share of all discharges that are elective admissions is highest among adults age 18 to 64 (28%), and the share of all discharges that are urgent admissions is highest among youth ages 17 and under (30%).

NOTES: Patient Age – Exhibit 11 excludes all type of admissions classified as newborn from the analysis, but includes children under the age of 1 in the category "17 and under" if they do not have a "newborn" type of admissions classification.

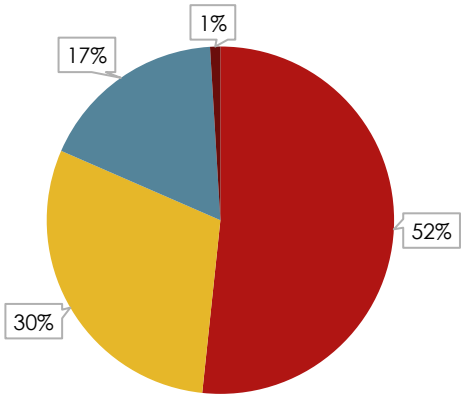
SOURCE: Schroeder Center for Health Policy analysis of hospital discharge data obtained from Virginia Health Information, 2016 Patient Level Data.

EXHIBIT 10. Type of Hospital Admission

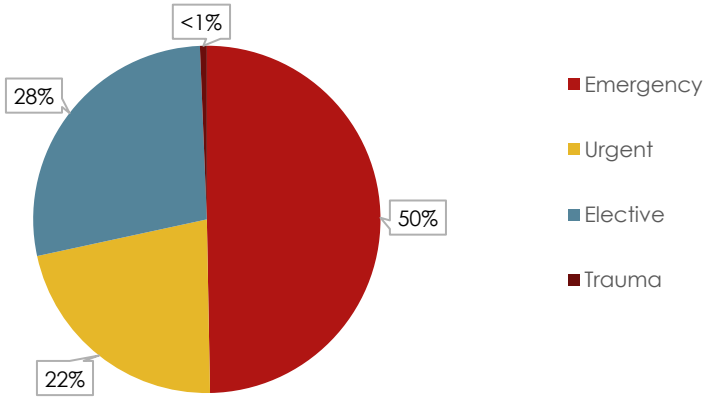
Admission Type	Number	Percent
Emergency	425,238	50.4%
Elective	138,932	16.5%
Urgent	180,855	21.4%
Newborn	94,045	11.1%
Trauma	3,865	0.5%
Unknown	653	0.1%
TOTAL	**843,588**	**100%**

EXHIBIT 11. Type of Hospital Admission by Patient Age (Excluding Newborn Admissions)

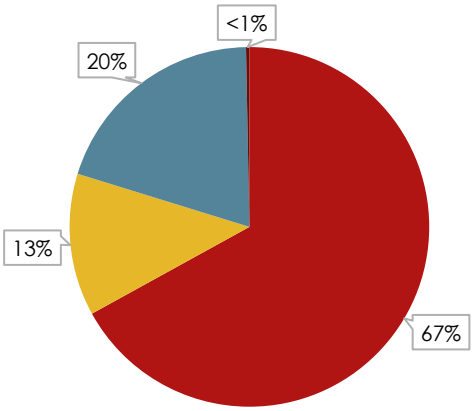
Youth: Ages 17 and under



Adults: Ages 18 - 64



Elderly: Ages 65 and over



NOTE: There are a total of 749,543 discharges containing information on hospital admission type and patient age, with 31,787 youth discharges, 414,574 discharges of adults age 18 to 64, and 303,182 elderly discharges.

SOURCE OF HOSPITAL ADMISSION: Overall and by Patient Age

Overall

Nearly 65% of hospital discharges (or 544,556 discharges) pertain to patients admitted from a non-health care facility (Exhibit 12). Over 15% (or 129,530 discharges) were admitted to the hospital by way of a clinic or physician's office, and 11% (or 93,792 discharges) were newborns born in the hospital.

Patient Age

In all broad age groups, the most common admission source is from outside of a healthcare facility (Exhibit 13). Among adults age 18 to 64 and the elderly, nearly 75% of discharges were admitted from outside of a healthcare facility. For youth age 17 and under, over 60% were admitted from outside of a healthcare facility. The second most common source of hospital admissions for adults age 18 to 64 and the elderly is from a clinic or physician's office. For youth, the second most common source of admissions is a transfer from another hospital.

NOTES: Admission Source -- Exhibit 13 excludes 8,226 discharges where the source of admission is not available as shown in Exhibit 12. Patient Age -- Exhibit 13 excludes all sources of admission classified as newborn from the analysis, but includes children under the age of 1 in the category "17 and under" if they do not have a "newborn" source of admissions classification.

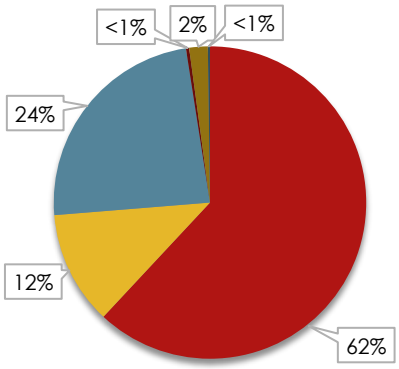
SOURCE: Schroeder Center for Health Policy analysis of hospital discharge data obtained from Virginia Health Information, 2016 Patient Level Data.

EXHIBIT 12. Source of Hospital Admission

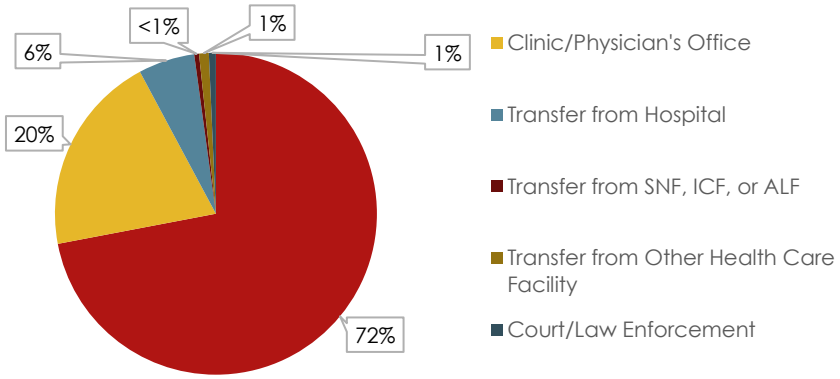
	Discharges	
Admission Source	**Number**	**Percent**
Non-health care facility	544,556	64.6%
Clinic or physician's office	129,530	15.4%
Newborn born in this hospital	93,792	11.1%
Transfer from hospital	46,638	5.5%
Transfer from skilled nursing facility, intermediate care facility, or assisted living facility	10,230	1.2%
Transfer from other health care facility	7,069	0.8%
Court/law enforcement	3,294	0.4%
Newborn born outside of this hospital	253	0.0%
Information not available	8,226	1.0%
TOTAL	**843,588**	**100%**

EXHIBIT 13. Source of Hospital Admission by Patient Age (Excluding Newborn Admissions)

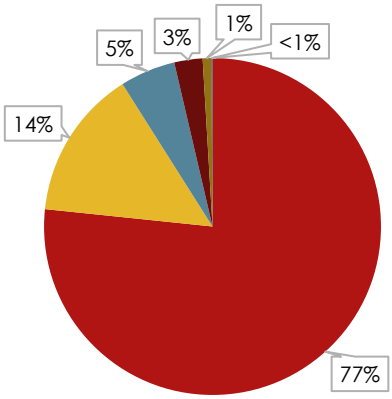
Youth: Ages 17 and Under



Adults: Ages 18 - 64



Elderly: Ages 65 and Over



NOTE: There are a total of 741,317 discharges containing information on hospital admission source and patient age, with 31,330 youth discharges, 409,546 discharges of adults age 18 to 64, and 300,441elderly discharges.

CONDITIONS FOR WHICH PATIENTS ARE HOSPITALIZED

PATIENT CONDITIONS: Twenty Most Common Reasons for Hospitalization

The 20 most common reasons for hospitalization account for over half of all patient discharges from Virginia's community hospitals (Exhibit 14). The most common patient condition for hospitalization is childbirth, which accounts for 94,069 discharges, or 11%. Septicemia is the second most common reason for hospitalization at 50,829 discharges, or 6%. Compared to the other 19 clinical conditions reported in Exhibit 14, septicemia has the longest average length of stay (7.1 days) and the highest amount of total charges ($2.9 billion).

Aside from childbirth and septicemia, each of the other conditions listed in Exhibit 14 accounts for less than 4% of all hospital discharges. Excluding septicemia, the other three conditions with the longest average length of stay are mood disorders (6.1 days) respiratory failure in adults (6.0 days), and complications of devices (5.8 days).

Excluding septicemia, the conditions resulting in the highest total charges are osteoarthritis ($1.9 billion), acute myocardial infarction or heart attack ($1.3 billion), and childbirth ($1.1 billion). Of the 20 most common reasons for hospitalization, spondylosis, intervertebral disc disorders, and other back problems account for the highest average charges per stay ($86,650) and the highest charges per day ($37,127).

SOURCES: Schroeder Center for Health Policy analysis of hospital discharge data obtained from Virginia Health Information, 2016 Patient Level Data; Agency for Healthcare Research and Quality, Healthcare Cost and Utilization Project, Clinical Classifications Software (CCS) for ICD-10-CM/PCS.

EXHIBIT 14. Twenty Most Common Reasons for Hospitalization

		Discharges		Average			Total
	Clinical Classification	Number	Percent	LOS (days)	Charges per Stay	Charges per Day	Charges (millions)
1	Liveborn	94,069	11.2%	3.5	$11,675	$1,779	$1,098.3
2	Septicemia (except in labor)	50,829	6.0%	7.1	$56,121	$8,361	$2,852.6
3	Osteoarthritis	30,253	3.6%	2.1	$61,332	$35,454	$1,855.5
4	Mood disorders	27,911	3.3%	6.1	$16,007	$2,918	$446.8
5	Congestive heart failure; nonhypertensive	20,568	2.4%	5.3	$39,853	$7,635	$819.7
6	Other complications of birth; puerperium affecting management of mother	19,951	2.4%	2.5	$14,231	$5,785	$283.9
7	Acute cerebrovascular disease	17,057	2.0%	5.5	$51,003	$11,383	$870.0
8	Cardiac dysrhythmias	16,835	2.0%	3.6	$39,881	$13,128	$671.4
9	Pneumonia (except that caused by tuberculosis or sexually transmitted disease)	16,048	1.9%	4.7	$30,029	$6,707	$481.9
10	Acute myocardial infarction	16,005	1.9%	4.3	$79,193	$24,713	$1,267.5
11	Complication of device; implant or graft	14,835	1.8%	5.8	$73,689	$18,517	$1,093.2
12	Chronic obstructive pulmonary disease and bronchiectasis	14,507	1.7%	4.2	$26,349	$6,880	$382.2
13	Diabetes mellitus with complications	14,202	1.7%	4.5	$33,692	$8,156	$478.5
14	Acute and unspecified renal failure	14,016	1.7%	4.9	$28,910	$6,584	$405.2
15	Respiratory failure; insufficiency; arrest (adult)	12,758	1.5%	6.0	$50,362	$8,842	$642.5
16	Previous C-section	12,314	1.5%	2.6	$16,279	$6,572	$200.5
17	Spondylosis; intervertebral disc disorders; other back problems	12,075	1.4%	3.3	$86,650	$37,127	$1,046.3
18	Hypertension with complications and secondary hypertension	11,822	1.4%	5.3	$45,499	$9,077	$537.9
19	Skin and subcutaneous tissue infections	11,490	1.4%	4.2	$24,067	$6,377	$276.5
20	OB-related trauma to perineum	11,261	1.3%	2.1	$10,844	$5,376	$122.1
TOTAL		**438,806**	**52.1%**				**$15,832.4**

PATIENT CONDITIONS: Most Common Reasons for Hospitalization by Patient Age

For infants less than age 1 and for adults between age 18 and 44, the most common reason for hospitalization is related to childbirth (Exhibit 15). For youth between the ages of 1 and 17, the most common reason for hospitalization is mood disorders, which account for 16% of all discharges for this age group. For adults age 45 and older, the most common reason for hospitalization is septicemia (also known as blood poisoning). Other common reasons for hospitalization include osteoarthritis for adults between the ages of 45 and 84 (28,911 discharges), acute myocardial infarction for adults between the ages of 45 and 64 (6,384 discharges), and congestive heart failure and acute cerebrovascular diseases for the oldest adults age 65 and above (14,797 and 10,979 discharges, respectively).

Mood disorders are among the top three reasons for hospitalization in patients between the ages of 1 and 64, with total charges reaching over $403.4 million. The average length of stay for these hospitalizations is between 5.0 and 8.1 days, depending on the age group.

Pregnancy-related hospitalizations account for four out of the top five reasons for hospitalization for patients between the ages of 18 and 44. Mood disorders, also in the top five, account for 14,396 discharges among this age group. Total charges for these pregnancy-related and mood disorder hospitalizations are nearly $935 million.

Of the top five reasons for hospitalization across all age groups, the longest average length of stay is for discharges of patients under age 1 hospitalized for short gestation, low birth weight, and fetal growth retardation. Average length of stay is 49.4 days for discharges of this type. The second longest average length of stay is 8.1 days for discharges associated with mood disorders among youth ages 1 to 17.

NOTES: Patient Age -- Percentages shown are percentage of discharges for each particular age category.

SOURCES: Schroeder Center for Health Policy analysis of hospital discharge data obtained from Virginia Health Information, 2016 Patient Level Data; Agency for Healthcare Research and Quality, Healthcare Cost and Utilization Project, Clinical Classifications Software (CCS) for ICD-10-CM/PCS.

EXHIBIT 15. Five Most Common Reasons for Hospitalization by Patient Age

Age (years)		Clinical Classification	Discharges		Average LOS (days)	Average Charges per Stay	Average Charges per Day	Total Charges (millions)
			Number	Percent				
Less than 1	1	Liveborn	94,066	91.9%	3.5	$11,676	$1,779	$1,098.3
	2	Other perinatal conditions	1,391	1.4%	7.8	$54,790	$6,289	$76.2
	3	Acute bronchitis	1,123	1.1%	4.4	$33,694	$5,298	$37.8
	4	Hemolytic jaundice and perinatal jaundice	887	0.9%	1.5	$4,990	$3,160	$4.4
	5	Short gestation; low birth weight; and fetal growth retardation	438	0.4%	49.4	$363,341	$7,715	$159.1
1 to 17	1	Mood disorders	3,757	16.0%	8.1	$17,532	$2,700	$65.9
	2	Pneumonia (except that caused by tuberculosis or sexually transmitted disease)	1,357	5.8%	3.0	$19,044	$6,356	$25.8
	3	Asthma	1,330	5.7%	1.9	$18,310	$9,036	$24.4
	4	Epilepsy; convulsions	742	3.2%	2.6	$27,196	$10,468	$20.2
	5	Maintenance chemotherapy; radiotherapy	660	2.8%	4.6	$39,578	$9,605	$26.1
18 to 44	1	Other complications of birth; puerperium affecting management of mother	19,672	9.4%	2.5	$14,190	$5,790	$279.1
	2	Mood disorders	14,396	6.9%	5.0	$13,365	$2,895	$192.4
	3	Previous C-section	12,270	5.9%	2.6	$16,278	$6,575	$199.7
	4	OB-related trauma to perineum and vulva	11,077	5.3%	2.1	$10,829	$5,380	$120.0
	5	Other complications of pregnancy	9,115	4.4%	3.2	$15,719	$5,807	$143.3
45 to 64	1	Septicemia (except in labor)	15,032	7.3%	7.7	$65,542	$9,054	$985.2
	2	Osteoarthritis	12,091	5.9%	2.0	$62,940	$38,975	$761.0
	3	Mood disorders	8,138	3.9%	6.3	$17,835	$3,037	$145.1
	4	Acute myocardial infarction	6,384	3.1%	3.9	$83,970	$28,757	$536.0
	5	Chronic obstructive pulmonary disease and bronchiectasis	5,528	2.7%	3.9	$26,675	$7,268	$147.5
65 to 84	1	Septicemia (except in labor)	21,498	9.1%	7.1	$54,572	$8,262	$1,173.2
	2	Osteoarthritis	16,820	7.1%	2.2	$60,161	$33,209	$1,011.9
	3	Congestive heart failure; nonhypertensive	10,213	4.3%	5.2	$38,514	$7,697	$393.3
	4	Cardiac dysrhythmias	9,060	3.8%	3.7	$41,694	$13,957	$377.7
	5	Acute cerebrovascular disease	8,050	3.4%	5.1	$46,933	$11,034	$377.8
85 and over	1	Septicemia (except in labor)	7,468	11.4%	6.2	$39,918	$7,069	$298.1
	2	Congestive heart failure; nonhypertensive	4,584	7.0%	4.7	$26,345	$6,141	$120.8
	3	Urinary tract infections	3,016	4.6%	4.1	$20,654	$5,745	$62.3
	4	Acute cerebrovascular disease	2,929	4.5%	4.6	$34,032	$8,518	$99.7
	5	Fracture of neck of femur (hip)	2,792	4.2%	5.7	$57,328	$11,770	$160.1

PATIENT CONDITIONS: Most Frequent Hospitalizations at Rural and Urban Hospitals

Among the 10 most common reasons that patients are hospitalized in rural and urban hospitals, five conditions are common to both types of hospitals: septicemia, childbirth, congestive heart failure, mood disorders, and osteoarthritis (Exhibit 16). In rural hospitals, the 10 most common reasons for hospitalization account for 36,784 discharges, or 42% of all discharges. In urban hospitals, the 10 most common reasons account for 277,337 discharges, or 37% of all discharges.

At both rural and urban hospitals, some of the most common types of hospitalizations can be characterized as potentially preventable or avoidable in certain circumstances and for particular age groups. These include hospitalizations for congestive heart failure, some types of pneumonia, and chronic obstructive pulmonary disease. Discharges of patients diagnosed with congestive heart failure are among the top six reasons for hospitalization in both rural and urban hospitals. Rural hospitals frequently admit patients who are diagnosed with pneumonia (3,332 discharges) and chronic obstructive pulmonary disease (3,624 discharges).

For patients treated for the same condition, the average length of stay is typically somewhat longer at urban hospitals than at rural hospitals. Hospitalizations for osteoarthritis are an exception; length of stay for these hospitalizations is somewhat longer in rural hospitals (2.5 days vs. 2.1 days in urban hospitals). The largest difference in length of stay between rural and urban hospitals is for septicemia, where patients at urban hospitals tend to remain in the hospital longer (7.5 days in urban hospitals vs. 5.1 days in rural hospitals).

Among frequent reasons for hospitalizations that are common to both rural and urban hospitals, urban hospitals have higher average charges per stay than do rural hospitals. The difference in average charges per stay at urban hospitals versus rural hospitals ranges from a low of $1,275 for mood disorders to a high of $29,116 for septicemia.

Among frequent reasons for hospitalizations that are common to both rural and urban hospitals, urban hospitals also have higher average charges per day. For childbirth and mood disorder discharges, the differences are small ($246 and $208, respectively). For osteoarthritis, the difference in average charges per day between urban and rural hospitals is much larger ($9,336).

SOURCES: Schroeder Center for Health Policy analysis of hospital discharge data obtained from Virginia Health Information, 2016 Patient Level Data; Agency for Healthcare Research and Quality, Healthcare Cost and Utilization Project, Clinical Classifications Software (CCS) for ICD-10-CM/PCS; Virginia Health Information, "Hospital Operating and Total Margins: Location per CMS POS File and FY Final Rule Correction Notices," 2016. Accessed by clicking "Click here (Excel)"; Agency for Healthcare Research and Quality, "Appendix B. Ambulatory Care Sensitive Conditions." Accessed 11/8/17.

EXHIBIT 16. Ten Most Common Reasons for Hospitalization at Rural and Urban Hospitals

Rural Hospitals

		Discharges		Average			
	Clinical Classification	Number	Percent	LOS (days)	Charges per Stay	Charges per Day	Total Charges (millions)
1	Septicemia (except in labor)	8,231	9.4%	5.1	$31,720	$7,354	$261.1
2	Liveborn	6,356	7.3%	2.1	$3,140	$1,549	$20.0
3	Chronic obstructive pulmonary disease and bronchiectasis	3,624	4.2%	3.8	$19,438	$6,239	$70.4
4	Congestive heart failure; nonhypertensive	3,426	3.9%	4.0	$21,863	$6,358	$74.9
5	Pneumonia (except that caused by tuberculosis or sexually transmitted disease)	3,332	3.8%	4.2	$22,753	$6,025	$75.8
6	Osteoarthritis	2,819	3.2%	2.5	$57,152	$26,988	$161.1
7	Mood disorders	2,556	2.9%	5.8	$14,849	$2,729	$38.0
8	Acute and unspecified renal failure	2,250	2.6%	3.8	$20,307	$6,234	$45.7
9	Respiratory failure; insufficiency; arrest (adult)	2,149	2.5%	5.0	$30,134	$7,554	$64.8
10	Diabetes mellitus with complications	2,041	2.3%	3.5	$19,983	$6,567	$40.8
TOTAL		**36,784**	**42.1%**				**$852.5**

Urban Hospitals

		Discharges		Average			
	Clinical Classification	Number	Percent	LOS (days)	Charges per Stay	Charges per Day	Total Charges (millions)
1	Liveborn	87,713	11.6%	3.6	$12,294	$1,795	$1,078.3
2	Septicemia (except in labor)	42,598	5.6%	7.5	$60,836	$8,556	$2,591.5
3	Osteoarthritis	27,434	3.6%	2.1	$61,762	$36,324	$1,694.4
4	Mood disorders	25,355	3.4%	6.1	$16,124	$2,937	$408.8
5	Other complications of birth; puerperium affecting management of mother	18,476	2.4%	2.5	$14,445	$5,805	$266.9
6	Congestive heart failure; nonhypertensive	17,142	2.3%	5.5	$43,449	$7,891	$744.8
7	Acute cerebrovascular disease	15,497	2.0%	5.7	$53,691	$11,556	$832.0
8	Cardiac dysrhythmias	14,809	2.0%	3.7	$42,219	$13,701	$625.2
9	Acute myocardial infarction	14,496	1.9%	4.5	$82,972	$25,375	$1,202.8
10	Complication of device; implant or graft	13,817	1.8%	5.9	$76,425	$18,990	$1,056.0
TOTAL		**277,337**	**36.6%**				**$10,500.7**

PATIENT CONDITIONS: Chronic and Non-Chronic

Non-chronic conditions account for 510,790 discharges, or nearly 61% of all hospitalizations in Virginia community hospitals (Exhibit 17). Chronic conditions account for 332,798 discharges, or 40% of all hospitalizations.

Chronic conditions result in a longer average length of stay when compared to non-chronic conditions (4.9 days vs. 4.4 days). Chronic conditions also result in higher average charges per stay ($49,129 vs. $33,051) and higher average charges per day ($14,458 vs. $8,243) when compared to non-chronic conditions. Hospitalizations for non-chronic conditions result in slightly higher total charges ($16.9 billion) compared to hospitalizations for chronic conditions ($16.4 billion).

NOTES: Patient Condition – Type of condition is based on a patient's primary diagnosis. Between 2015 and 2016, the number of chronic condition discharges increased by over 5,800. Some of this increase may be explained by coding artifacts created by transitioning from ICD-9 to ICD-10 (see Yoon, J., and Chow, A. (2017). "Comparing Chronic Condition Rates Using ICD-9 and ICD-10 in VA Patients FY2014-2016," *BMC Health Services Research* 17:572).

SOURCES: Schroeder Center for Health Policy analysis of hospital discharge data obtained from Virginia Health Information, 2016 Patient Level Data; Agency for Healthcare Research and Quality, Healthcare Cost and Utilization Project, Chronic Condition Indicator (CCI) for ICD-10-CM/PCS.

EXHIBIT 17. Hospitalizations for Chronic and Non-Chronic Conditions

	Discharges		Average			
Condition Type	Number	Percent	LOS (days)	Charges per Stay	Charges per Day	Total Charges (millions)
Non-Chronic	510,790	60.5%	4.4	$33,051	$8,243	$16,881.9
Chronic	332,798	39.5%	4.9	$49,129	$14,458	$16,350.1
TOTAL	**843,588**	**100%**	**4.6**	**$39,394**	**$10,695**	**$33,232.0**

PATIENT CONDITIONS: Reasons for Hospitalization of Chronic and Non-Chronic Conditions

Chronic Conditions

Nearly 40% of hospitalizations for chronic conditions are due to only six diagnoses: osteoarthritis, mood disorders, congestive heart failure, acute cerebrovascular disease, acute myocardial infarction, and cardiac dysrhythmias (Exhibit 18). Among all chronic conditions, osteoarthritis is the most common reason for hospitalization, accounting for 30,253 discharges or 9% of all chronic condition hospitalizations. Mood disorders is the second most common chronic condition resulting in hospitalization, accounting for 27,860 discharges.

For patients treated for chronic conditions, some of the most common types of hospitalizations can be characterized as potentially preventable or avoidable in certain circumstances and for particular age groups. These include hospitalizations for congestive heart failure and chronic obstructive pulmonary disease and some types of diabetes hospitalizations. Together, all hospitalizations for congestive heart failure, chronic obstructive pulmonary disease, and diabetes account for 49,109 discharges or nearly 15% of hospitalizations for chronic conditions. Average length of stay for these three conditions ranges from 4.3 to 5.3 days and average charges per stay range from $26,388 to $39,853.

Non-Chronic Conditions

Two conditions, childbirth and septicemia, account for over 28% of all non-chronic conditions. Childbirth accounts for 94,069 discharges and septicemia accounts for 50,829 discharges; these constitute 18% and 10% of total non-chronic hospitalizations, respectively (Exhibit 19). All other non-chronic condition hospitalizations are due to conditions accounting for less than 4% each of all such hospitalizations. Of particular note, over 16,000 discharges are for pneumonia caused by something other than tuberculosis or sexually transmitted diseases. As shown in Exhibit 19, pneumonia accounts for $481.9 million in total charges with an average charge per stay of $30,029.

NOTES: Patient Condition – Type of condition is based on a patient's primary diagnosis.

SOURCES: Schroeder Center for Health Policy analysis of hospital discharge data obtained from Virginia Health Information, 2016 Patient Level Data; Agency for Healthcare Research and Quality, Healthcare Cost and Utilization Project, Chronic Condition Indicator (CCI) for ICD-10-CM/PCS; Agency for Healthcare Research and Quality, Healthcare Cost and Utilization Project, Clinical Classifications Software (CCS) for ICD-10-CM/PCS.

EXHIBIT 18. Ten Most Common Reasons for Hospitalization for Chronic Conditions

		Discharges		Average			Total
	Clinical Classification	Number	Percent	LOS	Charges per Stay	Charges per Day	Charges (millions)
1	Osteoarthritis	30,253	9.1%	2.1	$61,332	$35,454	$1,855.5
2	Mood disorders	27,860	8.4%	6.1	$15,996	$2,918	$445.7
3	Congestive heart failure; nonhypertensive	20,568	6.2%	5.3	$39,853	$7,635	$819.7
4	Acute cerebrovascular disease	17,057	5.1%	5.5	$51,003	$11,383	$870.0
5	Acute myocardial infarction	16,005	4.8%	4.3	$79,193	$24,713	$1,267.5
6	Cardiac dysrhythmias	15,784	4.7%	3.7	$40,487	$13,227	$639.0
7	Chronic obstructive pulmonary disease and bronchiectasis	14,339	4.3%	4.3	$26,388	$6,859	$378.4
8	Diabetes mellitus with complications	14,202	4.3%	4.5	$33,692	$8,156	$478.5
9	Hypertension with complications and secondary hypertension	11,822	3.6%	5.3	$45,499	$9,077	$537.9
10	Alcohol-related disorders	9,951	3.0%	4.9	$25,117	$5,723	$249.9
TOTAL		**177,841**	**53.5%**				**$7,542.1**

EXHIBIT 19. Ten Most Common Reasons for Hospitalization for Non-Chronic Conditions

		Discharges		Average			Total
	Clinical Classification	Number	Percent	LOS	Charges per Stay	Charges per Day	Charges (millions)
1	Liveborn	94,069	18.4%	3.5	$11,675	$1,779	$1,098.2
2	Septicemia (except in labor)	50,829	10.0%	7.1	$56,121	$8,361	$2,852.6
3	Other complications of birth; puerperium affecting management of mother	17,958	3.5%	2.5	$14,414	$5,816	$258.8
4	Pneumonia (except that caused by tuberculosis or sexually transmitted disease)	16,048	3.1%	4.7	$30,029	$6,707	$481.9
5	Acute and unspecified renal failure	14,011	2.7%	4.9	$28,915	$6,584	$405.1
6	Complication of device; implant of graft	12,326	2.4%	5.9	$73,991	$18,764	$912.0
7	Previous C-section	12,314	2.4%	2.6	$16,279	$6,572	$200.5
8	Skin and subcutaneous tissue infections	11,490	2.2%	4.2	$24,067	$6,377	$276.5
9	OB-related trauma to perineum and vulva	11,261	2.2%	2.1	$10,843	$5,376	$122.1
10	Urinary tract infections	11,171	2.2%	3.9	$21,834	$6,462	$243.9
TOTAL		**251,477**	**49.1%**				**$6,851.6**

PATIENT CONDITIONS: Reasons for Emergency Hospitalizations

The 20 most common reasons for emergency hospitalizations account for 238,682 discharges, or 56% of all emergency hospitalizations, resulting in $9.5 billion in total charges (Exhibit 20). Septicemia is the most frequent reason for hospitalization with 42,822 discharges, followed by nonhypertensive congestive heart failure at 17,163 discharges. Together, these two conditions represent 14% of all emergency hospitalizations. Acute myocardial infarction is the condition with the highest average charges per stay ($77,752) and the highest average charges per day ($24,677).

Five of the most common types of emergency hospitalizations are sometimes characterized as potentially preventable or avoidable in certain circumstances and for particular age groups. These include hospitalizations for congestive heart failure, some types of pneumonia, chronic obstructive pulmonary disease, some types of diabetes, and urinary tract infections. Hospitalizations for these conditions are often characterized as preventable or avoidable because they would not be needed if the patient had access to quality outpatient care. Together, all hospitalizations for congestive heart failure, pneumonia, chronic obstructive pulmonary disease, diabetes, and urinary tract infections account for 63,218 discharges with charges totaling $1.9 billion, which does not take into account individual circumstances or patient age. The average lengths of stay for these discharges range between 3.9 and 5.0 days, and the average charges per stay are between $21,997 and $35,685.

NOTES: Reason for Hospitalization – Exhibit 20 includes only those discharges where type of hospital admission is classified as emergency.

SOURCES: Schroeder Center for Health Policy analysis of hospital discharge data obtained from Virginia Health Information, 2016 Patient Level Data; Agency for Healthcare Research and Quality, Healthcare Cost and Utilization Project, Clinical Classifications Software (CCS) for ICD-10-CM/PCS.

EXHIBIT 20. Twenty Most Common Conditions Resulting in Emergency Hospitalizations

		Discharges		Average			Total Charges (millions)
	Clinical Classification	Number	Percent	LOS	Charges per Stay	Charges per Day	
1	Septicemia (except in labor)	42,822	10.1%	6.9	$54,530	$8,403	$2,335.1
2	Congestive heart failure; nonhypertensive	17,163	4.0%	5.0	$35,685	$7,434	$612.5
3	Mood disorders	13,860	3.3%	5.7	$17,055	$3,308	$236.4
4	Acute cerebrovascular disease	13,847	3.3%	5.4	$50,731	$11,502	$702.5
5	Pneumonia (except that caused by tuberculosis or sexually transmitted disease)	13,142	3.1%	4.7	$30,135	$6,894	$396.0
6	Cardiac dysrhythmias	12,256	2.9%	3.6	$35,250	$10,685	$432.0
7	Chronic obstructive pulmonary	12,027	2.8%	4.1	$26,178	$7,014	$314.8
8	Acute myocardial infarction	11,894	2.8%	4.2	$77,752	$24,677	$924.8
9	Acute and unspecified renal failure	11,860	2.8%	4.8	$28,325	$6,628	$335.9
10	Diabetes mellitus with complications	11,499	2.7%	4.2	$30,446	$7,802	$350.1
11	Respiratory failure; insufficiency; arrest (adult)	10,387	2.4%	5.7	$49,048	$9,035	$509.5
12	Hypertension with complications and secondary hypertension	9,499	2.2%	5.1	$37,325	$7,897	$354.6
13	Urinary tract infections	9,387	2.2%	3.9	$21,997	$6,559	$206.5
14	Skin and subcutaneous tissue infections	8,917	2.1%	4.1	$24,390	$6,548	$217.5
15	Complication of device; implant graft	7,436	1.7%	6.6	$59,881	$10,457	$445.3
16	Gastrointestinal hemorrhage	7,407	1.7%	4.0	$32,877	$9,034	$243.5
17	Intestinal obstruction without hernia	6,558	1.5%	5.3	$36,215	$7,204	$237.5
18	Complications of surgical procedures or medical care	6,367	1.5%	6.2	$50,868	$8,731	$323.9
19	Alcohol-related disorders	6,341	1.5%	4.7	$28,973	$6,913	$183.7
20	Fluid and electrolyte disorders	6,013	1.4%	3.6	$22,745	$7,345	$136.8
TOTAL		**238,682**	**56.0%**				**$9,498.8**

PATIENT CONDITIONS: Mental Health Conditions Requiring Hospitalization

Many patients are treated in community hospitals for mental health conditions, resulting in over $1.2 billion in hospital charges. Of the nearly 62,000 hospitalizations for mental health conditions, nearly half of these are related to mood disorders with total hospital charges for this condition alone reaching nearly $447 million (Exhibit 21). Alcohol-related disorders and schizophrenia and other psychotic disorders together account for nearly one-third of mental health-related hospitalizations and $470 million in hospital charges. Other common mental health conditions resulting in hospital stays include substance-related disorders (4,315 discharges), suicide and self-inflicted injury (3,188 discharges), adjustment disorders (2,296 discharges), delirium dementia (1,788 discharges), and anxiety disorders (1,174 discharges).

Notes: Mental Health Conditions -- Exhibit 21 includes discharges assigned to Clinical Classifications Software (CCS) categories for mental conditions, namely CCS categories 650-663, and 670. The number of discharges for suicide and intentional self-inflicted injury in 2016 increased significantly from 2015. However, some of this increase may be explained by coding artifacts created by moving from ICD-9 to ICD-10 (see Stewart, C., Crawford, P.M., and Simon, G.E. (2017). "Changes in Coding of Suicide Attempts or Self-Harm with Transition from ICD-9 to ICD-10," *Psychiatric Services*. 68(3):215).

SOURCES: Schroeder Center for Health Policy analysis of hospital discharge data obtained from Virginia Health Information, 2016 Patient Level Data; Agency for Healthcare Research and Quality, Healthcare Cost and Utilization Project, Clinical Classifications Software (CCS) for ICD-10-CM/PCS.

EXHIBIT 21. Mental Health Conditions Requiring Hospitalization

Clinical Classification	Discharges		Average			Total Charges (millions)
	Number	Percent	LOS	Charges per Stay	Charges per Day	
Mood disorders	27,911	45.3%	6.1	$16,007	$2,918	$446.8
Alcohol-related disorders	10,065	16.3%	4.9	$25,003	$5,697	$251.7
Schizophrenia and other psychotic disorders	9,660	15.7%	8.7	$22,600	$2,926	$218.3
Substance-related disorders	4,315	7.0%	4.2	$17,532	$5,050	$75.6
Suicide and intentional self-inflicted injury	3,188	5.2%	3.3	$24,424	$8,451	$77.9
Adjustment disorders	2,296	3.7%	3.7	$10,775	$3,163	$24.7
Delirium dementia and amnestic and other cognitive disorders	1,788	2.9%	10.3	$26,918	$4,542	$48.1
Anxiety disorders	1,174	1.9%	6.0	$15,611	$4,016	$18.3
Miscellaneous mental health disorders	531	0.9%	4.1	$23,373	$8,074	$12.4
Attention-deficit conduct and disruptive behavior disorders	286	0.5%	6.1	$16,819	$3,186	$4.8
Personality disorders	185	0.3%	4.0	$10,596	$3,124	$2.0
Disorders usually diagnosed in infancy, childhood, or adolescence	95	0.2%	9.2	$22,015	$4,845	$2.1
Impulse control disorders NEC	72	0.1%	4.7	$10,431	$2,338	$0.8
Developmental disorders	20	0.0%	4.3	$20,271	$7,806	$0.4
TOTAL	**61,586**	**100%**				**$1,183.9**

PATIENT CONDITIONS: Mood Disorders Requiring Hospitalization

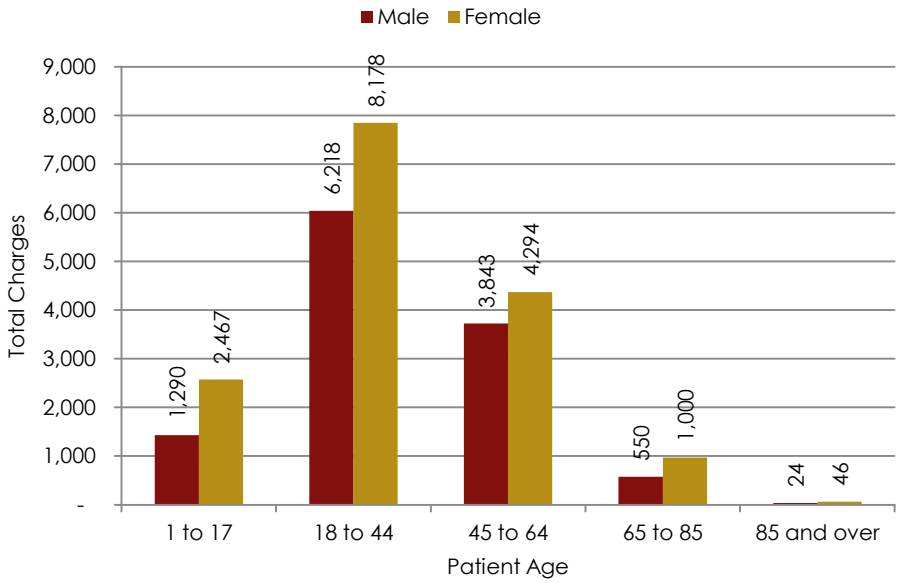
Female patients account for 57% of all mood disorder hospitalizations (e.g., hospitalization for bipolar disorder, manic disorder, and major depressive disorder) as shown in Exhibit 21. Female patients, in fact, have more hospitalizations for mood disorders than male patients across all age categories (Exhibit 22).

Adults between the ages of 18 and 44 account for over half of all mood disorder hospitalizations (Exhibit 22).

NOTES: Mood Disorder Discharges – Exhibit 22 includes those discharges assigned to the Clinical Classifications Software (CCS) category for mood disorders, namely CCS category 657. Patient Sex – Exhibit 22 excludes from analysis those patients whose sex is unknown. Patient Age – Children under age 1 are not included in this analysis.

SOURCES: Schroeder Center for Health Policy analysis of hospital discharge data obtained from Virginia Health Information, 2016 Patient Level Data; Agency for Healthcare Research and Quality, Healthcare Cost and Utilization Project, Clinical Classifications Software (CCS) for ICD-10-CM/PCS.

EXHIBIT 22. Mood Disorders Requiring Hospitalization by Patient Sex and Age



NOTE: There are a total of 27,910 discharges containing information on mood disorders, patient age, and patient sex.

DISCHARGE STATUS

DISCHARGE STATUS: All Patients

The vast majority of patients treated at Virginia's hospitals have a routine discharge (Exhibit 23). Nearly 67% of all discharges were routine discharges where patients were sent home after their hospital stay. In approximately 14% of discharges, patients were transferred to another medical facility or short-term general hospital for inpatient care, and in another 16% of discharges, patients were discharged to home health or hospice care. Nearly 18,300 patients died in the hospital. Patients who left against medical advice accounted for less than 1% of all discharges.

SOURCE: Schroeder Center for Health Policy analysis of hospital discharge data obtained from Virginia Health Information, 2016 Patient Level Data.

EXHIBIT 23. Discharge Status

	All Discharges	
Discharge Status	**Number**	**Percent**
Discharged to home or self-care; routine	560,709	66.5%
Discharged to home health or hospice care	132,799	15.7%
Discharged or transferred to another medical facility	107,352	12.7%
In-hospital deaths	18,321	2.2%
Discharged or transferred to short-term general hospital for inpatient care	14,446	1.7%
Left against medical advice	7,778	0.9%
Other	2,183	0.3%
TOTAL	**843,588**	**100%**

DISCHARGE STATUS: Most Common Reasons for Hospitalization among Those Who Died in the Hospital

Of those patients who died in the hospital, 49% were female and 51% were male. Almost half of all in-hospital deaths (8,681) occurred among adults age 65 to 84 (data not shown).

About 60% of all patients who died in the hospital were hospitalized for one of 10 conditions (Exhibit 24). The most common reason for hospitalization among patients who died was septicemia; the second most common reason was acute cerebrovascular disease.

The average charges per stay and average charges per day varied considerably among the common reasons for hospitalizations resulting in in-hospital deaths. For example, charges per stay range from $12,393 for other aftercare to $117,213 for acute myocardial infarction. Patients who were hospitalized with septicemia as their primary diagnosis and who later died accounted for the highest total charges ($414.2 million).

NOTES: In-Hospital Deaths – These deaths include patients with the following discharge status: expired; expired in a medical facility such as a hospital, skilled nursing facility, intermediate care facility, or freestanding hospice; and expired place unknown. The data presented in Exhibit 24 below are the most frequent reasons for hospitalization among those patients who later died in the hospital. These diagnoses may not be the cause of the in-hospital death.

SOURCES: Schroeder Center for Health Policy analysis of hospital discharge data obtained from Virginia Health Information, 2016 Patient Level Data; Agency for Healthcare Research and Quality, Healthcare Cost and Utilization Project, Clinical Classifications Software (CCS) for ICD-10-CM/PCS.

EXHIBIT 24. Ten Most Common Reasons for Hospitalization among In-Hospital Deaths

			Average				Total
	Clinical Classification	Deaths	Age (years)	LOS (days)	Charges per Stay	Charges per Day	Charges (millions)
1	Septicemia (except in labor)	5,142	72.9	6.9	$80,551	$14,964	$414.2
2	Acute cerebrovascular disease	1,316	73.9	5.3	$64,978	$16,049	$85.5
3	Respiratory failure; insufficiency; arrest (adult)	1,232	71.5	6.5	$74,258	$12,942	$91.5
4	Acute myocardial infarction	763	74.9	5.4	$117,213	$30,482	$89.4
5	Congestive heart failure; nonhypertensive	595	77.8	7.4	$85,176	$9,824	$50.7
6	Intracranial injury	422	66.4	5.4	$90,100	$25,108	$38.0
7	Other aftercare	404	74.8	4.7	$12,393	$2,341	$5.0
8	Acute and unspecified renal failure	394	75.6	6.7	$48,677	$9,165	$19.2
9	Secondary malignancies	356	64.9	7.8	$55,997	$7,670	$19.9
10	Pneumonia (except that caused by tuberculosis or sexually transmitted disease)	351	76.5	7.8	$67,487	$8,670	$23.7
TOTAL		**10,975**					**$837.1**

LENGTH OF STAY, CHARGES, AND PRIMARY SOURCE OF PAYMENT

LENGTH OF STAY AND CHARGES: By Patient Age, Sex, and Race/Ethnicity

Patient Age

Compared to other age groups, patients age 45 to 64 have both the highest average charges per stay ($51,398) and highest average charges per day ($14,480) (Exhibit 25). Adults age 65 to 84 represent the largest share of all discharges (28%) and have the highest total charges for any age group, at $12.0 billion. Youth age 1 to 17 have the lowest total charges for any age group, at $846.1 million.

Patient Sex

While female patients account for the greater share of discharges from Virginia's hospitals, male patients tend to stay longer once in the hospital (5.0 days vs. 4.4 days) (Exhibit 26). Compared to female patients, male patients also have higher average charges per stay ($45,001 vs. $35,271) and higher average charges per day ($11,645 vs. $9,997). However, because female patients account for a larger share of discharges, they account for a higher amount of total charges than males ($17.1 billion vs. $16.1 billion).

Patient Race/Ethnicity

Non-Hispanic white patients have the longest total length of stay (2.5 million days) and the highest total charges at $21.9 billion (Exhibit 27). Compared to other racial/ethnic groups, non-Hispanic black patients of any race have both the highest average length of stay in the hospital (5.1 days) and the highest average charges per stay ($44,267). Compared to other racial/ethnic groups, Hispanic patients of any race have both the shortest length of stay in the hospital at 3.8 days and the lowest average charges per stay at $23,092.

SOURCE: Schroeder Center for Health Policy analysis of hospital discharge data obtained from Virginia Health Information, 2016 Patient Level Data.

EXHIBIT 25. Length of Stay and Charges by Patient Age

Patient Age (years)	Discharges		Average			Total	
	Number	Percent	LOS (days)	Charges per Stay	Charges per Day	LOS (days)	Charges (millions)
1 or under	102,361	12.1%	4.0	$16,841	$2,237	405,610	$1,723.9
1 to 17	23,471	2.8%	4.6	$36,049	$9,746	108,353	$846.1
18 to 44	208,297	24.7%	3.8	$27,190	$8,393	781,216	$5,663.6
45 to 64	206,277	24.5%	5.1	$51,398	$14,480	1,045,608	$10,602.2
65 to 84	237,440	28.1%	5.1	$50,703	$13,743	1,221,555	$12,039.0
85 and over	65,742	7.8%	5.0	$35,855	$8,612	331,749	$2,357.2
TOTAL	**843,588**	**100%**	**4.6**	**$39,394**	**$10,695**	**3,894,091**	**$33,232.0**

EXHIBIT 26. Length of Stay and Charges by Patient Sex

Patient Sex	Discharges		Average			Total	
	Number	Percent	LOS (days)	Charges per Stay	Charges per Day	LOS (days)	Charges (millions)
Male	357,550	42.4%	5.0	$45,001	$11,645	1,779,103	$16,089.9
Female	485,980	57.6%	4.4	$35,271	$9,997	2,114,781	$17,141.0
Unknown	58	0.0%	3.6	$17,433	$4,440	207	$1.0
TOTAL	**843,588**	**100%**	**4.6**	**$39,394**	**$10,695**	**3,894,091**	**$33,232.0**

EXHIBIT 27. Length of Stay and Charges by Patient Race/Ethnicity

Patient Race/Ethnicity	Discharges		Average			Total	
	Number	Percent	LOS (days)	Charges per Stay	Charges per Day	LOS (days)	Charges (millions)
White non-Hispanic	537,103	63.7%	4.6	$40,827	$11,635	2,450,625	$21,928.5
Black non-Hispanic	189,470	22.5%	5.1	$44,267	$10,594	968,974	$8,387.4
Hispanic of any race	15,053	1.8%	3.8	$23,092	$6,942	57,918	$347.6
Asian	26,581	3.2%	4.0	$24,703	$6,688	106,240	$656.6
American Indian	896	0.1%	4.4	$37,034	$10,840	3,983	$33.2
Other	35,544	4.2%	4.0	$27,447	$7,448	140,808	$975.6
Unknown	38,941	4.6%	4.3	$23,191	$5,367	165,543	$903.1
TOTAL	**843,588**	**100%**	**4.6**	**$39,394**	**$10,695**	**3,894,091**	**$33,232.0**

PRIMARY PAYER: Total Discharges

Medicare is the primary source of payment for 40% of discharges, and private insurance is the primary source of payment for 34% of discharges (Exhibit 28). Together, public insurance programs (Medicare and Medicaid) are the primary payer for more than half (55%) of hospitalizations in Virginia. For just over 5% of discharges, patients are the primary payer for their own hospital care.

Among maternal discharges, private insurance is listed as the primary payer for nearly 60% and Medicaid is listed as the primary payer for 33% (data not shown). The remaining payers account for only 8% of all maternal discharges.

Discharges for which Medicare is the primary payer have, on average, the longest length of stay (5.2 days) and the highest charges (charges per stay of $47,553, charges per day of $12,310, and total charges of $16.2 billion). Discharges for which private insurance is the primary payer tend to have the shortest length of stay, on average, at 3.9 days. Discharges for which Medicaid is the primary payer have the lowest average charges per stay of $30,890.

SOURCE: Schroeder Center for Health Policy analysis of hospital discharge data obtained from Virginia Health Information, 2016 Patient Level Data.

EXHIBIT 28. Total Discharges, Length of Stay, and Charges by Primary Payer

	Discharges		Average			Total
Primary Payer	Number	Percent	LOS (days)	Charges per Stay	Charges per Day	Charges (millions)
Medicare	341,229	40.4%	5.2	$47,553	$12,310	$16,226.6
Medicaid	125,574	14.9%	4.8	$30,890	$6,677	$3,879.0
Private	284,742	33.8%	3.9	$34,846	$10,818	$9,922.2
Self-Pay	43,535	5.2%	4.0	$32,041	$9,515	$1,394.9
No Charge	14,040	1.7%	4.7	$41,103	$10,842	$577.1
Other	33,063	3.9%	4.6	$35,947	$9,789	$1,188.5
Unknown	1,405	0.2%	4.7	$31,094	$8,861	$43.7
TOTAL	**843,588**	**100%**	**4.6**	**$39,394**	**$10,695**	**$33,232.0**

PRIMARY PAYER: By Patient Age, Sex, and Race/Ethnicity

Patient Age

The elderly age 65 and over are most likely to have Medicare as the primary payer of their hospital stay compared to any other payer, while youth and adults under age 64 are more likely to rely on private insurance (Exhibit 29). Youth age 17 and under are more likely than the other age groups to have Medicaid serve as primary payer.

Patient Sex

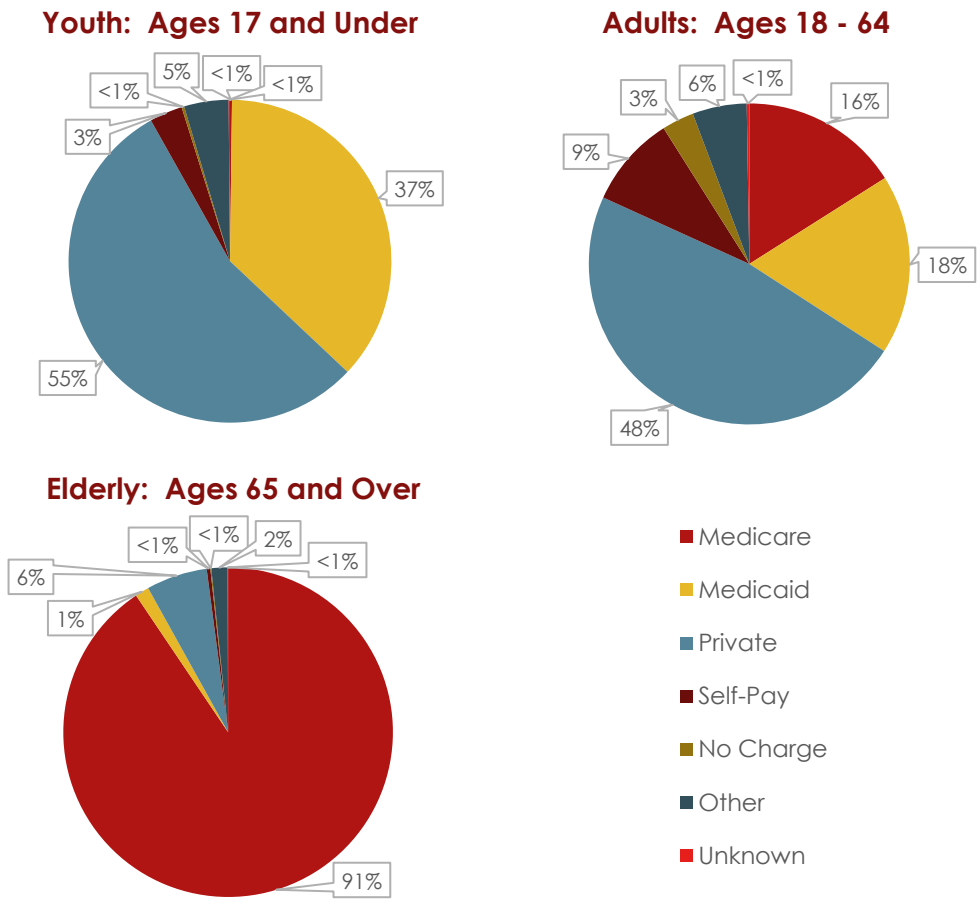
For both male and female patients of all ages, Medicare is the most common primary payer, followed by private insurance (Exhibit 30). Female patients are slightly more likely than male patients to use Medicaid and private insurance to pay for their hospital stays. Male patients, on the other hand, are slightly more likely than females to use Medicare, self-pay or not be charged.

Patient Race/Ethnicity

Non-Hispanic white and black as well as American Indian patients are most likely to use Medicare to pay for their hospital stays (Exhibit 31). Patients whose race/ethnicity is Hispanic or listed as "other" are most likely to use Medicaid. Patients whose race/ethnicity is Asian are most likely to use private insurance.

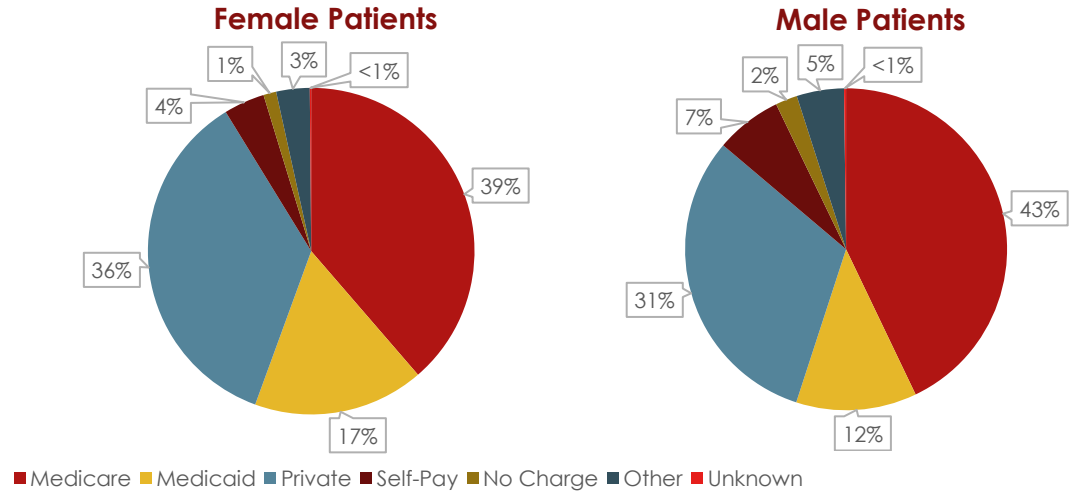
SOURCE: Schroeder Center for Health Policy analysis of hospital discharge data obtained from Virginia Health Information, 2016 Patient Level Data.

EXHIBIT 29. Total Discharges by Primary Payer and Patient Age



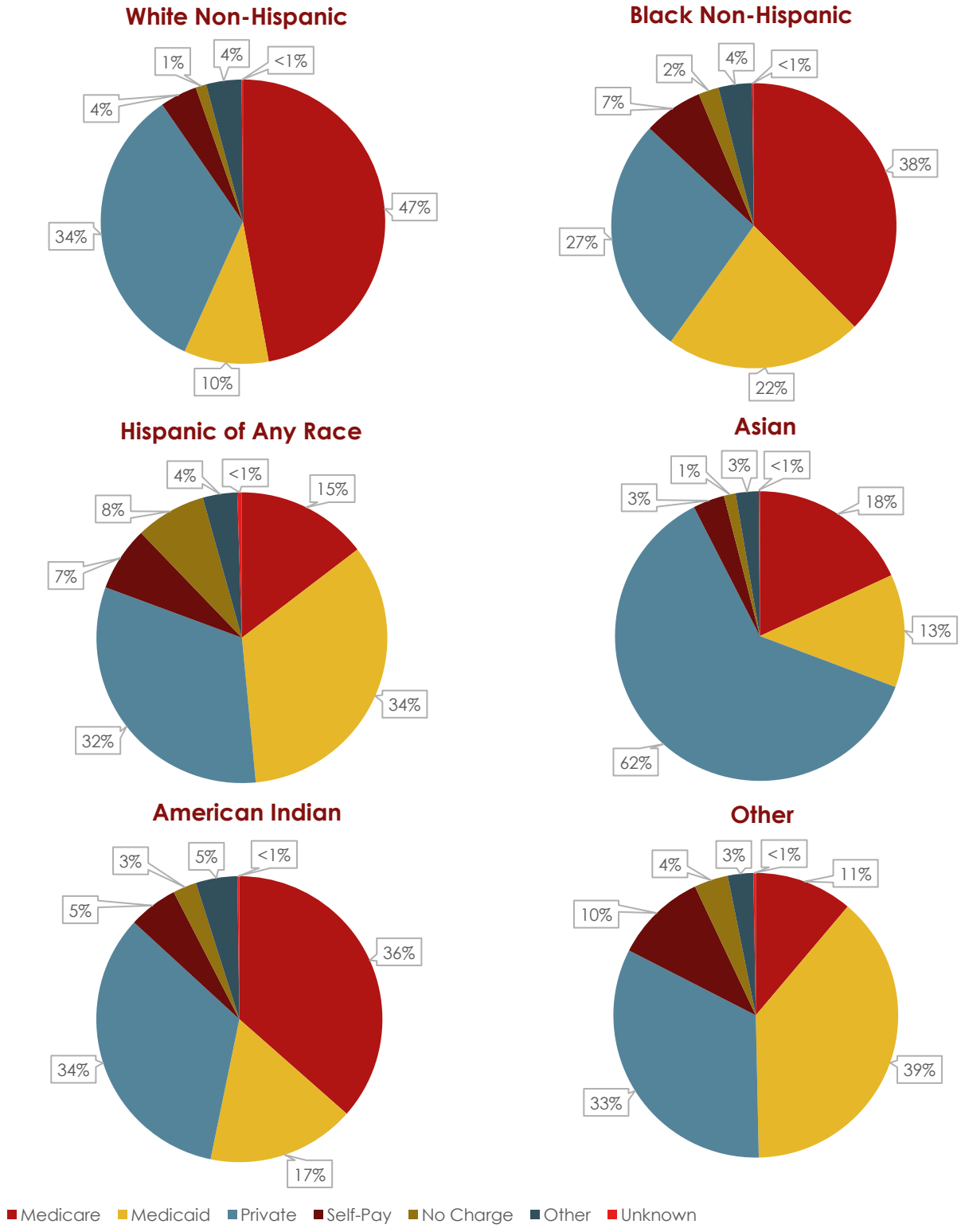
NOTE: There are a total of 843,588 discharges containing information on primary payer and patient age, with 125,832 youth discharges, 414,574 adult discharges, and 303,182 elderly discharges.

EXHIBIT 30. Total Discharges by Primary Payer and Patient Sex



NOTE: There are 843,530 discharges containing information on patient sex, with 485,980 female discharges and 357,550 male discharges.

EXHIBIT 31. Total Discharges by Primary Payer and Patient Race/Ethnicity



NOTE: There are 804,647 discharges containing information on patient race/ethnicity, with 537,103 white non-Hispanic discharges, 189,470 black non-Hispanic discharges, 15,053 Hispanic of any race discharges, 26,581Asian discharges, 896 American Indian discharges, and 35,544 discharges of other races.

PRIMARY PAYER: By Urban and Rural Hospitals

At both urban and rural hospitals, over half of all discharges list Medicare or Medicaid as the primary payer for hospital care (Exhibit 32). However, at rural hospitals a much larger share (68%) of discharges is paid by these two public programs compared to urban hospitals (54%). When obstetric patients are excluded from the analysis, the share of discharges paid by Medicare or Medicaid increases to 72% in rural hospitals and 61% in urban hospitals.

Private insurance is listed as the primary payer for a higher share of discharges occurring at urban hospitals than at rural hospitals (35% vs. 23%). At both types of hospitals, private insurance is listed as the primary payer for a smaller share of discharges when obstetrics patients are excluded (27% in urban hospitals and 19% in rural hospitals).

SOURCES: Schroeder Center for Health Policy analysis of hospital discharge data obtained from Virginia Health Information, 2016 Patient Level Data; Virginia Health Information, "Hospital Operating and Total Margins: Location per CMS POS File and FY Final Rule Correction Notices," 2016. Accessed by clicking on "Click here (Excel)."

EXHIBIT 32. Total Discharges from Urban and Rural Hospitals by Primary Payer

	All Discharges				Obstetric Discharges Excluded			
	Urban		Rural		Urban		Rural	
Payer	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**
Medicare	294,141	38.9%	47,088	54.0%	293,576	51.3%	46,951	63.5%
Medicaid	113,470	15.0%	12,104	13.9%	53,183	9.3%	6,060	8.2%
Private	264,442	35.0%	20,300	23.3%	156,018	27.3%	13,962	18.9%
Self-Pay	39,415	5.2%	4,120	4.7%	33,928	5.9%	3,686	5.0%
No Charge	12,849	1.7%	1,191	1.4%	12,323	2.2%	1,093	1.5%
Other	30,971	4.1%	2,092	2.4%	22,547	3.9%	1,947	2.6%
Unknown	1,049	0.1%	356	0.4%	906	0.2%	277	0.4%
TOTAL	**756,337**	**100%**	**87,251**	**100%**	**572,481**	**100%**	**73,976**	**100%**

UTILIZATION BY GEOGRAPHIC LOCATION

UTILIZATION BY GEOGRAPHIC LOCATION: Health Planning Region

Discharges appear to be fairly evenly distributed across Virginia's Health Planning Regions (Exhibit 33). While the Eastern region has the largest share of hospitalizations (186,181 discharges or 22%), the Northwest region has the lowest share (143,307 discharges or 17%).

Average length of stay is similar across the five health planning regions, ranging from 4.3 days in the Northern region to a high of 5.0 days in the Central region.

Charges per stay and total charges differ across the five health planning regions. The highest charges (average charges per stay and total charges) occur among hospitalizations in the Central region ($64,153 and $11.5 billion, respectively), while the lowest average charges per stay ($26,500) and the lowest total charges ($4.8 billion) occur among hospitals in the Northern region.

DATA DESCRIPTION: Hospital Planning Region – Percentages shown in Exhibit 33 are percentage of discharges for each particular Health Planning Region.

SOURCES: Schroeder Center for Health Policy analysis of hospital discharge data obtained from Virginia Health Information, 2016 Patient Level Data; Virginia Department of Health, "Health Planning Regions in Virginia" and "Location of Counties and Selected Cities in Virginia."

EXHIBIT 33. Total Discharges, Length of Stay, and Charges by Hospital Health Planning Region

Hospital Planning Region	Discharges		Average		Total	
	Number	Percent	LOS (days)	Charges per Stay	LOS (days)	Charges (millions)
Central	179,856	21.3%	5.0	$64,153	905,307	$11,538.2
Eastern	186,181	22.1%	4.7	$35,109	874,614	$6,536.6
Northern	180,017	21.3%	4.3	$26,500	782,203	$4,770.4
Northwest	143,307	17.0%	4.4	$35,599	630,500	$5,101.5
Southwest	154,227	18.3%	4.5	$34,269	701,467	$5,285.3
TOTAL	**843,588**	**100%**	**4.6**	**$39,394**	**3,894,091**	**$33,232.0**

UTILIZATION BY GEOGRAPHIC LOCATION: Urban and Rural

Nearly 90% of discharges occur at urban hospitals (Exhibit 34). Exhibit 4 provides a map showing the location of these hospitals. Compared to hospitalizations at rural hospitals, hospitalizations at urban hospitals are marked by a longer average length of stay (4.7 days vs. 3.9 days), higher average charges per stay ($41,207 vs. $23,672) and higher average charges per day ($11,016 vs. $7,912). In terms of total charges, urban hospitals account for nearly 94% of all charges ($31.2 billion) compared to $2.1 billion for rural hospitals.

When obstetric patients are excluded, the average lengths of stay at both urban and rural hospitals increase (5.1 days and 4.2 days, respectively) as do the average charges per stay ($49,632 and $26,506) and average charges per day ($13,305 and $8,665) (data not shown).

SOURCES: Schroeder Center for Health Policy analysis of hospital discharge data obtained from Virginia Health Information, 2016 Patient Level Data; Virginia Health Information, "Hospital Operating and Total Margins: Location per CMS POS File and FY Final Rule Correction Notices," 2016. Accessed by clicking on "Click here (Excel)."

EXHIBIT 34. Total Discharges, Length of Stay, and Charges at Urban and Rural Hospitals

	Discharges		Average			Total	
Hospital Location	Number	Percent	LOS (days)	Charges per Stay	Charges per Day	LOS (days)	Charges (millions)
Urban	756,337	89.7%	4.7	$41,207	$11,016	3,567,131	$31,166.6
Rural	87,251	10.3%	3.9	$23,672	$7,912	340,061	$2,065.4
TOTAL	**843,588**	**100%**	**4.6**	**$39,394**	**$10,695**	**$3,907,192**	**$33,232.0**

UTILIZATION BY GEOGRAPHIC LOCATION: Locality of Residence

Nearly 43% of all Virginia hospitalizations (341,005 discharges) are accounted for by residents of just ten localities in the state. These include the counties of Fairfax, Chesterfield, Henrico, Prince William, and Loudoun and the cities of Virginia Beach, Richmond, Norfolk, Chesapeake, and Newport News. Compared to all other Virginia cities and counties, Fairfax County has the single highest number of discharges at 75,174, and Highland County has the lowest at 244 discharges.

The number of discharges per 1,000 population spans a broad range (Exhibit 35). The cities of Petersburg and Roanoke as well as Alleghany County, for example, have the highest discharge rates of 162.1 or above. The city of Bristol and Scott County have the lowest discharge rates of 17.0 or under.

NOTES: Patient Residence -- This exhibit excludes patients who are discharged from a Virginia hospital but who are not residents of the state.

SOURCES: Schroeder Center for Health Policy analysis of hospital discharge data obtained from Virginia Health Information, 2016 Patient Level Data; American Academy of Family Physicians, UDS Mapper, 2016, "Zip Code to ZCTA Crosswalk"; Missouri Census Data Center, 2017, "MABLE/Geocorr 14: Geographic Correspondence Engine; University of Virginia, Weldon Cooper Center for Public Service, Demographics Research Group, "Virginia Population Estimates: 2016," 2017.

EXHIBIT 35. Hospital Discharge Rates by Patient Locality of Residence

	City/County	Discharges Number	Discharges Rate per 1,000		City/County	Discharges Number	Discharges Rate per 1,000
1	Petersburg City	5,394	168.5	44	Roanoke County	11,588	123.4
2	Alleghany County	2,570	165.2	45	Caroline County	3,638	122.5
3	Roanoke City	16,150	162.1	46	Mathews County	1,059	122.5
4	Franklin City	1,284	149.3	47	Amherst County	3,913	121.7
5	Pulaski County	5,158	149.2	48	Buena Vista City	781	120.1
6	Bath County	690	148.3	49	Winchester City	3,294	119.7
7	Dinwiddie County	4,131	145.6	50	Middlesex County	1,321	119.6
8	Colonial Heights City	2,501	144.5	51	Henry County	6,239	119.2
9	Nottoway County	2,318	143.9	52	Botetourt County	3,949	119.0
10	Covington City	841	140.9	53	Mecklenburg County	3,698	118.0
11	Page County	3,313	140.5	54	Bedford County	9,105	117.5
12	Lancaster County	1,571	139.8	55	Waynesboro City	2,566	117.5
13	Northampton County	1,697	139.8	56	Louisa County	4,007	116.8
14	Hopewell City	3,194	139.5	57	Prince Edward County	2,741	116.2
15	Greensville County	1,617	139.1	58	Warren County	4,525	115.5
16	Lunenburg County	1,667	134.8	59	Norton City	445	115.4
17	Appomattox County	2,074	134.8	60	Orange County	3,867	114.5
18	Prince George County	4,893	133.5	61	Franklin County	6,410	114.1
19	Southampton County	2,434	133.5	62	Emporia City	679	113.5
20	Westmoreland County	2,361	133.4	63	Augusta County	8,481	113.4
21	Northumberland	1,604	132.7	64	Halifax County	4,029	113.2
22	Amelia County	1,703	132.5	65	Madison County	1,479	112.9
23	Sussex County	1,551	132.1	66	Lynchburg City	8,949	112.5
24	Salem City	3,345	131.3	67	Buckingham County	1,877	111.0
25	Giles County	2,230	131.0	68	Spotsylvania County	14,384	110.9
26	Cumberland County	1,290	130.9	69	Henrico County	35,616	110.9
27	Essex County	1,400	129.7	70	Russell County	3,070	110.9
28	Surry County	873	129.5	71	Gloucester County	4,088	110.5
29	Brunswick County	2,161	129.5	72	Galax City	754	110.4
30	Fredericksburg City	3,490	129.1	73	Nelson County	1,637	110.4
31	Richmond City	28,462	128.4	74	Richmond County	995	110.2
32	Martinsville City	1,736	128.1	75	Pittsylvania County	6,864	109.6
33	Charlotte County	1,567	127.2	76	Chesterfield County	36,449	109.1
34	Danville City	5,299	126.3	77	Floyd County	1,672	109.1
35	Staunton City	3,083	126.1	78	Culpeper County	5,351	108.3
36	Wythe County	3,576	125.6	79	Rockingham County	8,628	108.2
37	Craig County	655	125.5	80	King William County	1,763	107.9
38	Campbell County	6,932	124.8	81	Highland County	244	106.0
39	Portsmouth City	11,997	124.7	82	Isle of Wight County	3,913	105.5
40	King and Queen	892	124.7	83	Buchanan County	2,324	103.4
41	Shenandoah County	5,218	124.4	84	Rockbridge County	2,296	103.2
42	Smyth County	3,854	124.1	85	Newport News City	18,689	102.0
43	Charles City County	895	123.4	86	Norfolk City	25,022	101.3

EXHIBIT 35. Hospital Discharge Rates by Patient Locality of Residence (continued)

	City/County	Discharges	
		Number	Rate per 1,000
87	King George County	2,501	101.1
88	Fauquier County	6,825	100.1
89	Powhatan County	2,868	99.9
90	Hampton City	13,705	99.7
91	Rappahannock	728	99.6
92	Goochland County	2,220	99.5
93	Frederick County	8,326	99.1
94	James City County	7,249	98.5
95	Suffolk City	8,980	97.9
96	Hanover County	10,145	96.4
97	New Kent County	1,996	95.5
98	Chesapeake City	22,961	95.5
99	Clarke County	1,341	94.2
100	Dickenson County	1,408	93.9
101	Greene County	1,842	93.1
102	Williamsburg City	1,406	91.1
103	Wise County	3,596	91.0
104	Poquoson City	1,107	90.1
105	Virginia Beach City	40,410	89.1
106	Tazewell County	3,854	88.9
107	Fluvanna County	2,320	88.8
108	Stafford County	12,430	87.6
109	Grayson County	1,381	86.7
110	Lexington City	624	85.5
111	Washington County	4,543	85.1
112	Carroll County	2,471	85.0
113	Radford City	1,456	84.5
114	Albemarle County	8,892	84.1
115	Accomack County	2,755	82.7
116	Bland County	537	81.8
117	Harrisonburg City	4,400	81.1
118	Manassas Park City	1,268	80.2
119	Manassas City	3,337	80.2
120	Montgomery County	7,720	78.4
121	Patrick County	1,357	75.2
122	Alexandria City	11,973	75.1
123	Charlottesville City	3,666	74.7
124	York County	5,029	73.3
125	Prince William County	32,799	73.2
126	Fairfax County	75,174	66.1
127	Loudoun County	25,423	66.0
128	Fairfax City	1,492	64.2
129	Arlington County	12,672	53.5
130	Falls Church City	710	50.3
131	Lee County	1,032	41.9
132	Bristol City	301	17.0
133	Scott County	263	11.6
	TOTAL	**801,561**	

APPENDIX: Definitions

The following definitions were used in preparing this report:

Race/Ethnicity

Patient race/ethnicity is categorized in the raw data as either white, black, other, Asian, American Indian, Hispanic, black Hispanic, or unknown. In most analyses in this report, Hispanic and black Hispanic are combined into a single category called Hispanic (any race). In some analyses, patients are categorized into one of only three racial/ethnic categories (white, black, and other), where the category of other includes Asians, American Indians, Hispanics of any race, unknown race and other race.

Diagnoses and Procedures

Patient diagnoses and procedures are reported following the International Classification of Diseases (ICD).[7] For 2016 data, this report uses ICD-10CM/PCS classifications.

Most Common Reasons for Hospitalization

To identify the most common reasons for hospitalization, patient discharges are linked to a larger clinical classification category by merging the principal diagnosis code on the discharge record to the Agency for Healthcare Research and Quality's Clinical Classifications Software (CCS) for ICD-10-CM/PCS.[8] Discharges in each CCS category are counted, and the CCS categories with the highest counts of discharges are considered the most frequent conditions or reasons for hospitalization.

Chronic and Non-Chronic Conditions

Patient discharges are identified as being attributable to either a chronic or a non-chronic condition by merging the primary diagnosis code to the Agency for Healthcare Research and Quality's Chronic Condition Indicator (CCI) software for ICD-10-CM/PCS.[9]

Total Charges

Total charges are reported for discharges grouped by CCS category, or by patient age, sex, or race/ethnicity, or by primary payer. For each group, the total charges in the group are calculated by summing the total charge amount on the discharge record for all discharge records in the group.

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[7] U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Health Statistics, "International Classification of Diseases, (ICD-10-CM/PCS) Transition – Background." Accessed 11/13/17.

[8] Agency for Healthcare Research and Quality, Healthcare Cost and Utilization Project, Clinical Classifications Software (CCS) for ICD-10-CM/PCS.

[9] Agency for Healthcare Research and Quality, Healthcare Cost and Utilization Project, Chronic Condition Indicator (CCI) for ICD-10-CM/PCS.

Average Charge per Stay

Average charges per stay are reported for discharges grouped by CCS category, or by patient age, sex, or race/ethnicity, or by primary payer. For each group, the average charge per stay is calculated by dividing total charges in the group by the number of discharges in the group.

Average Charge per Day

Average charges per day are reported for discharges grouped by CCS category, or by patient age, sex, or race/ethnicity, or by primary payer. For each group, the charge per day is calculated as follows. First, for each discharge, the total charge is divided by the length of stay to determine the discharge's charge per day. Second, the average charge per day is calculated by taking the mean of the charge per day for all discharges in the group. Note that the average charge per day will not equal the average charge per stay divided by the average length of stay unless all discharges in the group have the same charge per day. Also note that patient length of stay is listed as 0 days for a small percent of discharges, and when calculating average charges per day (and only in this case), length of stay values equal to 0 are recoded to 1.

Patient County of Residence and Hospital Health Planning Region

Patient county of residence is assigned to the discharge record using the patient ZIP code and a ZIP-to-ZCTA crosswalk from UDS Mapper[10] and a ZCTA-to-county crosswalk from Mable/Geocorr14.[11] In those cases where a patient discharge cannot be matched to a ZCTA, the discharges are assigned manually to a county on an individual basis. In cases where a ZIP code lies within more than one county, the discharge records in question are allocated to all counties in which the ZIP code is located, and summary statistics such as counts and discharge rates are weighted by the proportion of the ZIP code in each county.

Counties are assigned to the appropriate Virginia Health Planning Region using information provided by the Virginia Department of Health.[12]

Rural and Urban Hospitals

Hospitals are classified as rural or urban according to documentation available from Virginia Health Information.[13]

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[10] American Academy of Family Physicians, UDS Mapper. 2016. "ZIP Code to ZCTA Crosswalk." Accessed 12/6/17.
[11] Missouri Census Data Center. 2017. "MABLE/Geocorr14: Geographic Correspondence Engine." Accessed 11/13/17.
[12] Virginia Department of Health. (No Date). "Health Planning Regions in Virginia" and "Location of Counties and Selected Cities in Virginia." Accessed 11/13/17.
[13] Virginia Health Information, "Hospital Operating and Total Margins: Location per CMS POS File and FY Final Rule Correction Notices," 2016. Accessed by clicking on "Click here (Excel)."

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