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Diabetes Hospitalizations in Virginia

Schroeder Center Statistical Brief

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Highlights:

- In 2014, nearly 24% of 850,195 hospitalizations that took place in Virginia involved patients with diabetes.
- The mean cost associated with hospitalization of a patient with diabetes was $9,670 in 2014 compared to $7,834 for a non-diabetic patient.
- The average length of stay for patients hospitalized with diabetes was 5.3 days, nearly a day longer than the 4.6-day average stay for non-diabetic hospitalizations.
- For over 63% of patients with diabetes, the primary payer for hospitalizations was Medicare.

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Diabetes is a very prominent disease in the U.S. According to a 2014 report from the Centers for Disease Control and Prevention (CDC), 29.1 million people or 9.3% of the U.S. population, have diabetes. Of these persons, 8.1 million remained undiagnosed. Diabetes also represents a substantial economic burden. The CDC estimates that diabetes cost $245 billion in 2012, including $176 billion in direct medical costs.[1]

This brief examines the characteristics of patients with diabetes admitted to Virginia hospitals in 2014. In doing so, this brief looks to answer a number of questions about diabetes in Virginia, namely: What types of patients tend to be admitted to the hospital with diabetes? How much do hospital stays by diabetes patients cost, and who pays? How does diabetes hospitalization vary across geographic regions, and what are the most common comorbidities associated with hospitalizations for patients with diabetes? This brief follows the methodological approach used in a related analysis of a nationwide sample of inpatient hospitalizations of patients with diabetes.[2]

Findings

Of the total number of 850,195 hospitalizations that took place at all facilities in Virginia, 201,456 or 23.7% involved patients with diabetes. Among discharges involving patients aged 1 year or older, diabetes was present in 201,336 cases or 26.9% of all 748,128 discharges for this group of patients. These figures may include readmissions or repeat hospitalizations by the same individuals, as these are more common among patients with diabetes than patients overall.[3] Of these 201,456 discharges involving diabetes patients, diabetes was reported as the principal diagnosis for 13,709 hospitalizations, meaning that the remainder of hospitalizations pertained to patients with diabetes whose principal reason for treatment was for some other condition.

Exhibit 1 describes the characteristics of hospitalizations for patients with diabetes as compared to other hospitalizations. The average age of patients hospitalized with diabetes was 64.7 years, noticeably higher than the average age of 43.9 years among

discharges of non-diabetics. Additionally 52.2% of patients hospitalized for diabetes were female, which is lower than the share of female patients (59.8%) among non-diabetic hospitalizations.

The average length of stay for patients hospitalized with diabetes was 5.3 days, nearly a day longer than the 4.6-day average stay for non-diabetic hospitalizations. The most common admission type among hospitalizations for patients with diabetes was "emergency," constituting 66.8% of those hospitalizations. The mean cost associated with hospitalization of a patient with diabetes was $9,670. This, too, is noticeably higher than the mean cost of $7,834 among discharges for those without diabetes.

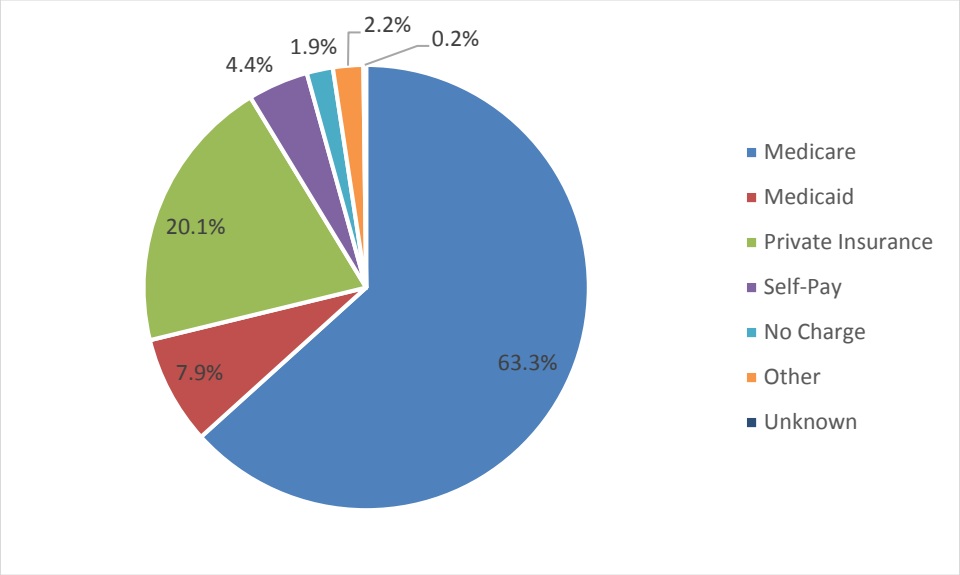
Exhibit 1. Characteristics of Discharges among Patients with Diabetes

	Hospital Stays for Patients With Diabetes	Hospital Stays for Patients Without Diabetes	Hospital Stays for Patients With Diabetes as Principal Diagnosis
Total Number of Discharges	201,456	648,739	13,709
Percentage of Total Discharges	23.7%	76.3%	1.6%
Mean Age	64.7	43.9	51.3
Number Female*	105,110 (52.2%)	388,059 (59.8%)	6,555 (47.8%)
Mean Length of Stay	5.3	4.6	4.6
Mean Costs	$9,670	$7,834	$7,054
Planning Regions			
Region 1 – Central VA	32,194 (16.0%)	105,884 (16.3%)	2,260 (16.5%)
Region 2 – Eastern VA	26,158 (13.0%)	136,464 (21.0%)	1,786 (13.0%)
Region 3 – Northern VA	42,640 (21.2%)	106,821 (16.5%)	2,755 (20.1%)
Region 4 – Northwest VA	42,726 (21.2%)	128,224 (19.8%)	3,104 (22.6%)
Region 5 – Southwest VA	47,516 (23.6%)	139,980 (21.6%)	3,158 (23.0%)
Unknown	10,222 (5.1%)	31,366 (4.8%)	646 (4.7%)
Admit Type*			
Emergency	134,595 (66.8%)	268,198 (41.4%)	10,552 (77.0%)
Urgent	29,625 (14.7%)	119,414 (18.4%)	1,995 (14.6%)
Elective	36,470 (18.1%)	163,340 (25.2%)	1,142 (8.3%)
Newborn	73 (0.0%)	93,889 (14.5%)	0 (0%)
Trauma	526 (0.3%)	3,052 (0.5%)	9 (0.1%)
Unknown	151 (0.1%)	563 (0.1%)	11 (0.1%)

Source: Schroeder Center analysis of Virginia Health Information data
Notes: * indicates that percentages do not sum to 100% due to a small number of hospitalizations with missing data for patient sex and admission type.

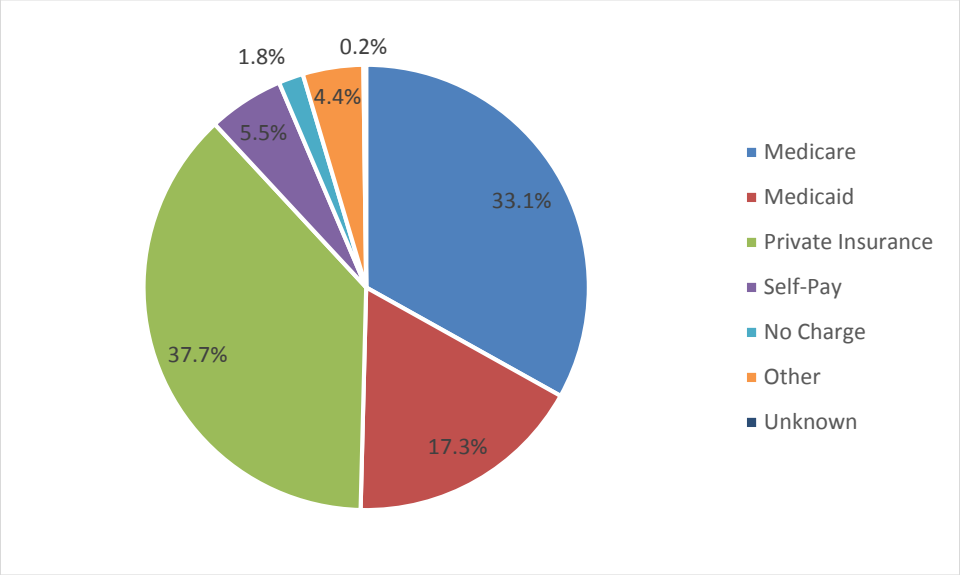
Exhibits 2, 3, and 4 show the share of hospitalizations of patients with diabetes, without diabetes, and with diabetes as the principal diagnosis, respectively, in which the primary payer was Medicare, Medicaid, private insurance, self-pay, no charge, other, and unknown. For patients with *any* diagnosis of diabetes and for those with diabetes as the principal diagnosis, the primary payer for hospitalizations was Medicare (63.3% as shown in Exhibit 2 and 42.7% as shown in Exhibit 4, respectively). For patients *without* diabetes, the primary payer was private insurance (37.7%) followed by Medicare (33.1%), as shown in Exhibit 3. Among patients with any diagnosis of diabetes, 20.1% of hospitalizations were for patients primarily using private insurance, while 7.9% of hospitalizations were for patients primarily using Medicaid as their main payer.

Exhibit 2. Hospitalizations of Patients with Diabetes by Payer



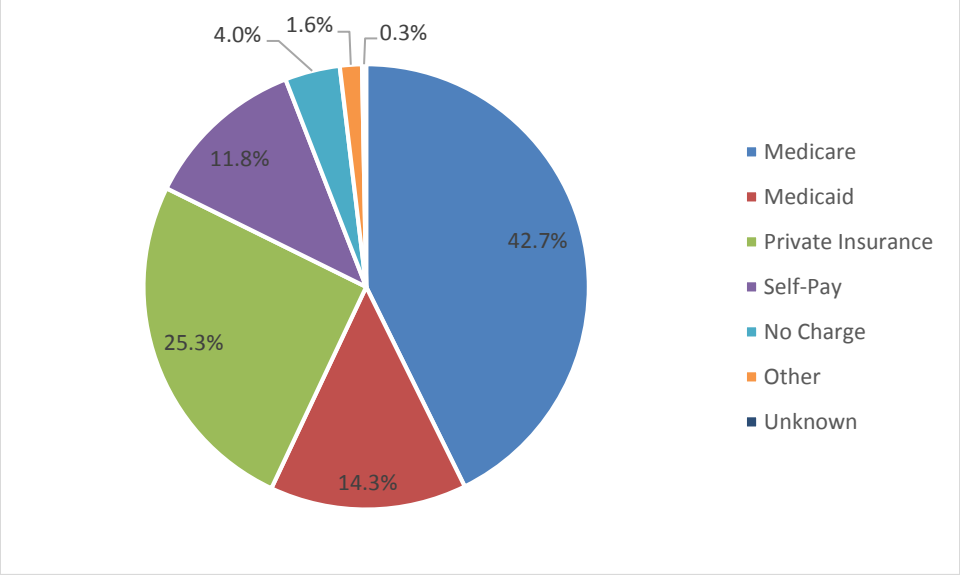
Source: Schroeder Center analysis of Virginia Health Information data

Exhibit 3. Hospitalizations of Patients Without Diabetes by Payer



Source: Schroeder Center analysis of Virginia Health Information data

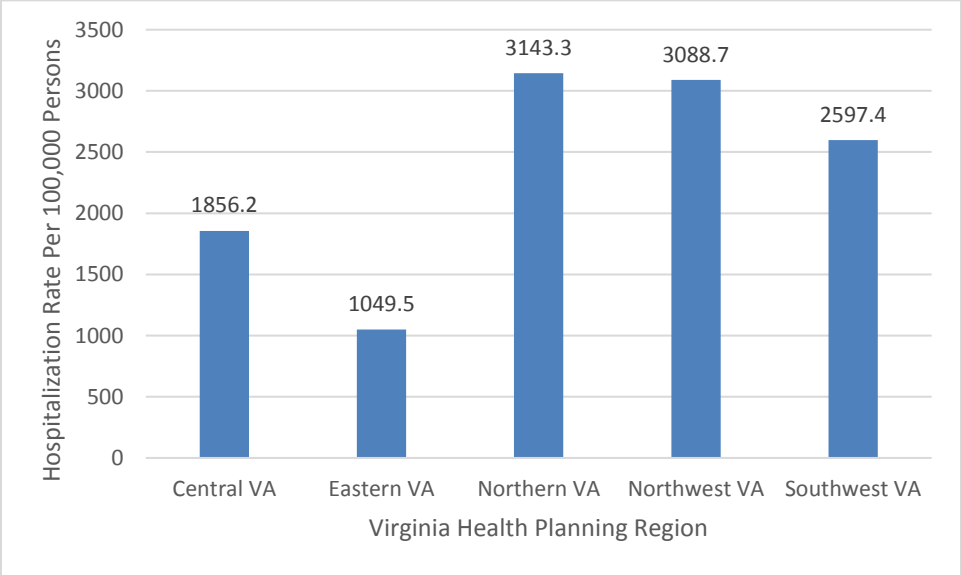
Exhibit 4. Hospitalizations of Patients with Diabetes as the Principal Diagnosis by Payer



Source: Schroeder Center analysis of Virginia Health Information data

Exhibit 5 shows the distribution of hospitalization rates of patients with diabetes per 100,000 persons by Virginia Health Planning Region. Northern Virginia had the highest hospitalization rate at 3143.3. Northwest and Southwest followed with 3088.7 and 2597.4 diabetes hospitalizations per 100,000 persons, respectively. These three regions had hospitalization rates that were noticeably higher than the respective rates of 1856.2 and 1049.5 for Central and Eastern Virginia.

Exhibit 5. Hospitalization Rates of Patients Per 100,000 Persons with Diabetes by Region



Calculated using Schroeder Center analysis of Virginia Health Information data and the U.S. Census Bureau, American Community Survey Office, American FactFinder. (2014). "B01003 :Total Population," *2014 American Community Survey 5 year estimates*. Retrieved from http://factfinder2.census.gov.

Exhibit 6 presents the prevalence of certain common comorbidities occurring with hospitalizations of patients with any diagnosis of diabetes. Highest among them is chronic cardiovascular disease, which is observed in 51.5% of diabetes hospitalizations. This is substantially higher than the rate of 22.0% among non-diabetic discharges. Chronic renal disease is present for 28.1% of all hospitalizations of patients with diabetes – much higher than the 7.8% rate among non-diabetic hospitalizations. No single other comorbidity was observed among more than a quarter of discharges among diabetes patients.

Exhibit 6. Prevalence of Common Comorbidities among Hospitalizations of Patients with Any Diabetes Diagnosis

	Prevalence of Notable Comorbidities Among Patients with Diabetes	Prevalence of Notable Comorbidities Among Patients without Diabetes
Chronic Cardiovascular Disease	103,735 (51.5%)	142,732 (22.0%)
Chronic Renal Disease	56,658 (28.1%)	50,627 (7.8%)
Chronic Pulmonary Disease	47,501 (23.6%)	90,707 (14.0%)
Cerebrovascular Degeneration	25,328 (12.6%)	58,192 (9.0%)
Cancer	12,858 (6.4%)	33,988 (5.2%)
Chronic Liver Disease	9,221 (4.6%)	16,290 (2.5%)

Source: Schroeder Center analysis of Virginia Health Information data

Data and Methodology

This brief uses Patient Level Data (PLD) from Virginia Health Information (VHI) to examine diabetes hospitalizations in Virginia in 2014.[4] Hospitalizations for diabetes were identified using the primary diagnosis code and up to 17 secondary diagnosis codes on the discharge. Diagnoses codes are reported using the International Classification of Diseases, Ninth Revision, Clinical Modification (or ICD-9-CM) and are selected using the Clinical Classifications Software (CCS). The CCS groups ICD-9-CM diagnosis codes into meaningful categories. In this report, diabetes hospitalizations are defined as CCS diagnosis categories of 49 (diabetes without complications) and 50 (diabetes with complications). Principal diagnosis was defined as the diagnosis appearing in the "DX1" field of the VHI data. Costs were calculated by converting the total charges reported for the discharge using cost-to-charge ratios for Virginia hospitals. The all-payer cost-to-charge ratio was calculated using CMS Healthcare Report Information System (HCRIS) Worksheet C Part I. 2014 Medicare Cost Reports do not contain costs and charges information for a small number of facilities in Virginia. In these cases, the mean cost-to-charge ratio for Virginia short-term acute facilities (0.3) is used.

References

[1] Centers for Disease Control and Prevention (2014). "National Diabetes Statistics Report: Estimates of Diabetes and Its Burden in the United States, 2014." Available at https://www.cdc.gov/diabetes/pubs/statsreport14/national-diabetes-report-web.pdf

[2] Healthcare Cost and Utilization Project (2010). "Hospital Stays for Patients with Diabetes, 2008." Statistical Brief #93. Available at: http://www.hcup-us.ahrq.gov/reports/statbriefs/sb93.jsp

[3] Robbins JM, Webb DA (2006). "Diagnosing Diabetes and Preventing Rehospitalizations: The Urban Diabetes Study." *Med Care* 44:292–296.

[4] 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 file, report, publication, or database, 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.