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**HOSPITALIZATIONS AND  
ASSOCIATED CHARGES FOR CANCER  
AMONG ADULTS IN VIRGINIA  
2003**





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# **Hospitalizations and Associated Charges for Cancer Among Adults in Virginia, 2003**

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## TABLE OF CONTENTS

<b>ABSTRACT</b> .....	2
<b>INTRODUCTION</b> .....	3
<b>METHODS AND DATA ANALYSIS</b> .....	4
<b>RESULTS</b> .....	5
<b>DISCUSSION</b> .....	8
<b>CONCLUSION</b> .....	10
<b>REFERENCES</b> .....	11
<b>APPENDIX OF TABLES</b>	
<b>Table 1.</b> Cancer-Related Hospitalizations and Charges among Adults in Virginia, 2003 .....	12
<b>Table 2.</b> Cancer-Related Hospitalization Usage and Charges among Adults in Virginia by Type of Cancer, 2003 .....	13
<b>Table 3.</b> Age, Gender and Ethnicity of Patients Hospitalized with Cancer in Virginia, 2003 .....	14
<b>Table 4.</b> Total Charges of Adults Hospitalized with Cancer in Virginia by Age, Gender, and Ethnicity, 2003 .....	15
<b>Table 5.</b> Cancer-Related Hospitalization Charges among Adults in Virginia by Health Planning Region and Type of Cancer, 2003 .....	16
<b>Table 6.</b> Hospitalization Charges of Cancer Patients in Virginia by Age and Primary Payer Source, 2003 .....	17
<b>Table 7.</b> Hospitalizations of Cancer Patients by Primary Payer Source and Race Among Adults in Virginia, 2003 .....	18
<b>Table 8.</b> Cancer-Related Hospital Stays among Adults in Virginia by Type of Cancer, 2003 .....	18
<b>Table 9.</b> Hospitalization Healthcare Expenditure Among Adults in Virginia by Cancer Type, 2003 .....	19
<b>Table 10.</b> Hospitalization Healthcare Utilization and Expenditure by Race in Virginia, 2003 .....	20
<b>Table 11.</b> Logistic Regression Model Predicting Hospital Admission by Emergency Room by Race Adjusted for Age in Virginia, 2003 .....	21
<b>Table 12.</b> Logistic Regression Model Predicting Hospital Admission by Emergency Room by Race Adjusted for Age Categories in Virginia, 2003 .....	21

## ABSTRACT

The purpose of this report was to determine the hospitalizations and associated charges billed for cancer among adults in the State of Virginia in 2003 for all cancers combined and for the specific cancer sites of lung, breast, prostate, colon and rectum, cervix, and skin. This report may be used by health planning regions, legislative entities, and to assist the efforts of statewide cancer control entities as they engage in relevant program and health policy planning to offer appropriate services. The data were obtained from Virginia Health Information 2003, a database that contains patient-level hospital discharge data collected for administrative purposes, including charges billed for patients hospitalized in Virginia. Patients with cancer listed as their primary or secondary ICD-9 diagnostic code (140-208.0) and classified as a malignant neoplasm, and 18 years of age or older were used as the primary study sample. Limited charges billed analyses were performed for hospitalized patients 0-17 years.

In 2003 in Virginia, there were 40,253 cancer stays with a primary or secondary malignant neoplasm discharge diagnoses at a charge of \$978,467,903. Adults accounted for approximately 83 percent of hospital stays and over 94 percent of hospital charges billed related to primary and secondary cancer discharge diagnoses. There were 37,730 adult cancer stays at a charge of \$921,308,279 including charges of \$703,852,607 for primary and \$217,455,672 for secondary diagnoses. The average and median charges per hospital stay for adult patients with cancer as a primary diagnosis were \$27,153 and \$17,966, respectively. Compared to

2002 with 27,344 hospital discharges at a charge exceeding \$670 million, hospitalization charges billed for cancer as a primary diagnoses increased by over \$33 million, despite 1410 fewer hospital stays, in 2003 in Virginia.

Six cancer types accounted for about 36.2 percent of the charges among adults hospitalized for cancer as their primary or secondary diagnoses in Virginia. The highest total charges for primary and secondary cancer-specific diagnoses were associated with lung cancer at \$151 million. The highest primary and secondary diagnoses cancer-specific charge per stay were associated with colorectal cancer (\$29,460). The Northwest Region had the highest total charges among adults in Virginia for primary and secondary diagnoses for any cancer at \$253,565,000. Adjusted for age, African-American patients with cancer were 60 percent more likely to be admitted to the hospital from the emergency room. African-American patients also had the lowest routine care charges and the highest room and board charges. As the age categories increased, patients were more likely to be admitted to the hospital from the emergency room than patients in younger age categories.

Efforts to increase the level of service delivery, both before entering the hospital by way of the emergency room and while in the hospital as indicated by the level of routine care charges must be made to eliminate racial disparities in healthcare among patients with cancer in Virginia. Additionally, disparities in hospital charges for colorectal cancer and higher charges for five of six specific cancer types in the Northwest Health Planning Region, need further exploration.

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## INTRODUCTION

Cancer is the second leading cause of death in Virginia and accounted for 65,029 deaths between 1996-2000 (American Cancer Society, Mid-Atlantic Division Cancer Facts & Figures, 2003). The purpose of this study was to determine the hospitalizations and associated charges billed for cancer in the State of Virginia in 2003 for all cancers combined and for the specific cancer sites of lung, breast, prostate, colon and rectum, cervix, and skin. Additionally, the study determined the stratification of charges by gender, race, age, and health region and, detailed payer source and admission source. The study also provided data on healthcare use with special attention to length of stay, including pre- and post-operating length of stays. This descriptive inpatient charges billed analysis will lay the groundwork for a comprehensive report of the cost of cancer in the State of Virginia. This study may be used by health planning regions, legislative entities, and to assist the efforts of statewide cancer control entities as they engage in relevant program and health policy planning to offer appropriate services.

Because minorities suffer disproportionately from the burden of cancer, it is important to reveal if there are differences in patterns of hospital use and expenditure that may better explain cancer disparities and accompanying financial charges. Therefore, another aim of this report was to determine the impact of race on the conditions of hospital admission, healthcare use, and healthcare expenditure in patients with cancer. There were three study hypotheses. First, was there a difference in the source of hospital admission by race in patients with cancer and how did race

predict admission from the emergency room? Second, was there a difference in healthcare use by race in patients with cancer and was there a difference in length of stay by race? Third, was there a difference in healthcare expenditure by race in patients with cancer and was there a difference in total hospital charges by race? Answers to the proposed questions in this study may reveal racial differences in the severity of condition at hospital entry, hospital use, and hospital routine care.

## METHODS AND DATA ANALYSIS

A cross-sectional design of adults using data obtained from the Virginia Health Information 2003 database was conducted. The database contains patient-level data, is collected for administrative purposes, and contains over 300,000 patients. Patients with cancer listed as their primary or secondary ICD-9 diagnostic code (140-208.0) and 18 years of age or older were used as the study sample. The following ICD-9 codes were used for analyses: 140-208 for all cancers combined; and, for the specific cancer sites of lung (162-3), breast (174-5), prostate (185), colon and rectum (153.4-159), cervix (180), and skin (172). This report only included cancers classified as malignant neoplasms. The admission source was the place from which the patient was admitted to the hospital and included the emergency room, referral by physician clinic, HMO, hospital transfer, skilled nursing facility (SNF) transfer, other healthcare facility, or court/law enforcement. The admission source variable was dichotomized into the categories of “emergency room” and “no emergency room” (all admission sources except “emergency room” were collapsed into this category). The payer source included private insurance, Medicare, Medicaid, self-pay or other. Healthcare use was measured by the following variables: length of stay (LOS), pre-operation LOS (PRLS), and post-operation LOS (PSLOS). Healthcare expenditure was measured by total charges and further measured by room and board charges, operating room charges, and routine hospital care charges.

The t-test was used to compare continuous variables, and dichotomous and categorical variables were analyzed using the Cochran-Mantel-Haenszel chi-square test for proportions and presented as odd ratios (OR) with 95 percent confidence intervals. Multiple linear regression was used to predict total charges and LOS and multiple logistic regression analyses were performed on the admission source variable main outcome, “Emergency Room” or “No Emergency Room.” Race was the main predictor and potential interactors/confounders were gender and age. Appropriate analyses were conducted to look at the distribution and normality of the variables race, age, and gender and to decide if either should be included in the initial prediction model as a multiplicative variable. Total charges, LOS, PRLS, PSLOS, and age were assessed as continuous variables. The median was also reported for data that was not normally distributed and tested using the Wilcoxon Rank Sum Test. All statistical analyses were performed using the SAS 8.1 version. The level of significance was set at  $\alpha = .05$ . The Kruskal Wallis, a non-parametric test of the ANOVA, was used on race and total charges. Level of significance for differences between groups was set at  $\alpha = 0.01$ . This stricter alpha criterion was used to detect meaningful differences in the large sample size. All related tables are located in the appendix.

## RESULTS

In 2003, there were 859,252 Virginia hospital stays. Of those, 712,072 were adult stays at a charge of over \$12 billion. There were 40,253 cancer stays with a primary or secondary malignant neoplasm discharge diagnoses at a charge of \$978,467,903. Adult cancer stays accounted for 37,730 at a charge of \$921,308,279, including charges of \$703,852,607 for primary and \$217,455,672 for secondary diagnoses. This study was delimited to adults 18 years and older who account for approximately 83 percent of hospital stays and over 94 percent of hospital charges related to primary and secondary cancer discharge diagnoses. Table 1 in the Appendix breaks down these hospitalization charges in Virginia.

The average length of stay was two days longer for cancer patients (6.94 days) with primary and secondary diagnoses compared to patients without primary and secondary cancer diagnoses (4.94 days). Although total charges per stay for patients with primary and secondary cancer diagnoses were lower (about \$900 million) than those without (about \$11 billion), the average (approximately \$24,000) and median (\$16,000) charges per cancer stay were greater compared to patients without primary and secondary cancer diagnoses (average \$17,000; median \$10,000). The average and median charges per hospital stay for patients with cancer as a primary diagnosis were \$27,153 and \$17,966, respectively.

The highest primary and secondary diagnosed cancer-specific total charges were associated with lung cancer (\$151 million), followed by colorectal cancer (\$112 million), breast cancer (\$31.5 million), prostate

cancer (\$31.4 million), cervical cancer (\$5 million), and skin cancer (\$1 million). The six cancer types accounted for 36.2 percent of the charges billed among adults hospitalized and 34.1 percent of the charges billed among all persons hospitalized for primary and secondary cancer diagnoses in Virginia. The highest average cancer-specific charge per stay were associated with colorectal (\$29,460), followed by lung (\$23,305), cervical (\$17,164), prostate (\$16,939), breast (\$15,507), and skin (\$15,085) cancers with primary and secondary diagnoses. Colorectal cancer was associated with the longest average hospital stay (8.45 days) and breast cancer stays were the shortest (2.98 days). Charges billed are broken down by cancer type in Table 2 in the Appendix.

Between male and female adults in Virginia, percentages for hospitalizations and associated charges billed were mostly evenly distributed. Considerably more males were hospitalized for lung (56%) and skin (64.7%) cancers than females. The associated charges for lung and skin cancer hospitalizations for males were \$84,476,000 and \$799,000 respectively, compared to \$67,054,000 and \$483,000 respectively for females. Tables 3 and 4 in the Appendix breaks down these charges by cancer type stratified by age, gender, and ethnicity.

For any cancer, as well as the six specific types of cancer, patients hospitalized were more likely to be White (76.2%), followed by Black (20.5%), Asian (1.47%), Hispanic (1.12%) and other (0.75%). This pattern was consistent for hospitalizations except for cervical cancer and breast cancer whereby the Hispanic percentages were greater than the Asian

percentages (4.92% vs. 1.64% and 1.25% vs. 1.20%, respectively). Lung cancer hospitalization charges were highest for all ethnic groups except Hispanic where hospitalization for colorectal cancer was highest. (See Table 4).

There are five health planning regions in Virginia: Eastern Region (1), Southwest Region (2), Northern Region (3), Northwest Region (4), and Central Region (5). The highest total charges among adults in Virginia for primary and secondary diagnoses for any cancer were associated with the Northwest Region at a charge of \$253,565,000 followed by the Central Region, the Southwest Region, the Northern Region, and Eastern Region with the lowest charges of \$107,557,000. Lung cancer, colorectal cancer, prostate cancer, cervical cancer, and breast cancer hospitalization charges were highest in the Northwest Region and lowest in the Eastern Region. The Northwest Region accounted for 54 percent of the state's total hospital charges billed for colorectal cancer. Skin cancer hospitalization charges were highest in the Central Region and lowest in the Eastern Region. (See Table 5 in Appendix).

For charges billed associated with hospitalizations of patients with primary and secondary diagnoses of any cancer, Medicare covered 48 percent, private insurance covered 38 percent, Medicaid covered 8.4 percent, and self-pay accounted for about 2.5 percent. Medicare followed by private insurance covered the highest charges associated with lung cancer and colorectal cancer. Private insurance followed by Medicare covered the highest charges associated with prostate, cervical, skin, and breast cancers.

Medicare was the primary payer source for the Black and White patients while private insurance was the primary payer source for Asian, Hispanic, and other patients. (See Tables 6 and 7).

The patient population was stratified into 10-year age groups beginning with the age group 18-27 to the age group 68-year and over. The 68-year and over group was the largest group hospitalized (44.3%) and accounted for 43 percent of the charges for primary and secondary diagnoses of any cancer in Virginia. Lung, colorectal, skin, and breast cancers were highest among the 68-year and over group. Prostate cancer was highest among the age group 58-67 years. Cervical cancer was highest among the age group 38-47 years. (See Table 6).

For any cancer, the highest Medicare and Medicaid charges were for the 68-year and over group. Private insurance and "All Other" as payer sources for any cancer were highest for the 48-57 year age group. Self-pay as payer source was highest for the 58-67 year age group. Private insurance was the primary payer for lung cancer, colon cancer, prostate cancer, cervical cancer, and breast cancer hospitalizations for the age groups 18-27, 28-37, 38-47, and 58-67 and Medicare was the primary payer for the age group 68-year and over. For skin cancer, self-pay was highest for the 28-37 year age group, private insurance was highest among the age groups of 38-47, 48-57, and 58-67 and, Medicare was highest among the age group of 68-year and over. (See Table 6).

Healthcare use was measured by the following variables: LOS, PRLOS, and PSLOS. The LOS (7.51 vs. 6.63), PRLOS (4.10 vs. 3.65), and PSLOS (6.54

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vs. 5.90) were significantly longer for African-American patients than White patients ( $p < 0.0001$ ). There were no other significant differences by ethnicity. Table 8 in the Appendix breaks down length of hospital stays by cancer type. Severity of cancer was not available in the database.

Healthcare expenditure was measured by total charges and also measured by assessing room and board charges, operating room charges, and routine hospital care charges. Total charges were significantly less for White patients (\$24,000) than African-American patients (\$25,000). Room and board charges were significantly less ( $p < 0.0001$ ) for White patients (\$2,900) than African-American patients (\$3,200) and Hispanic patients (\$3,400). Operating room charges were significantly more ( $p < 0.0001$ ) for White patients (\$5,700) than Asian patients (\$4,900) and Hispanic patients (\$4,600). Operating room charges were also significantly more ( $p < 0.0001$ ) for African-American patients (\$5,800) than Asian patients and Hispanic patients. (See Table 10).

Significant differences in routine care charges by ethnicity were identified ( $p < 0.0001$ ). Routine care charges for White patients were significantly more than for African-American, Hispanic, Asian and “other” patients. African-American patients and patients classified as “other” had significantly less routine care charges than Hispanic and Asian patients. (See Table 11). Using White patients as the referent variable, the crude effect measure for race predicting admission source was significant for African-American patients. African-American patients with cancer were 1.51 times more likely to be admitted to

the hospital from the emergency room than White patients with cancer. Adjusted for age, African-American patients were 1.60, Asian patients were 1.34, and Hispanic patients were 1.42 times more likely to be admitted to the hospital from the emergency room than White patients with cancer. Additionally, as the years in the age groups increased, patients were more likely to be admitted to the hospital from the emergency room than younger patients. The Hosmer and Lemeshow goodness of fit test had a p-value of 0.66 indicating that this model is a good model given the parameters for predicting hospital admission from the emergency room. The 95 percent confidence interval did not contain 1 for the adjusted OR African-American, Asian, and Hispanic patients, and the p-value was significant for African-American patients. (See Tables 9, 10, and 11).

## DISCUSSION

Although this study of cancer hospitalization charges in Virginia is not comprehensive, the hospital charges are actual and not estimated and are also based on primary and secondary cancer diagnosed discharges during the full calendar year of 2003 as opposed to one quarter with the other quarters estimated as in a study that was used as a model for this study (Texas Department of Health, 2001). Hospitalizations for cancer as a primary diagnosis produced charges totaling \$670,716,423 million dollars for 27,344 hospital discharges in 2002 (VDH, 2004). Hospitalizations for cancer as a primary diagnosis produced charges that exceeded over \$703,852,607 million dollars for 25,934 in 2003. This represents over a \$33 million dollar increase in hospitalization charges over a one year period, despite 1410 fewer cancer primary diagnosis discharges in 2003.

The average charge per stay for specific cancer types did not follow the same pattern as total charges billed. Total charges were highest in order for lung, colorectal, breast, prostate, cervical, and skin. However, average charge per stay was highest in order for colorectal, lung, cervical, prostate, breast, and skin. Colorectal cancer also accounted for the longest average length of stay followed by lung, skin, cervical, prostate, and breast.

Total cancer hospitalization charges were highest in the Northwest Region despite the Central Region actually having the highest number of hospital stays. This was accounted for by the highest hospitalization charges for five of the six cancer types associated with the Northwest Region. Also deserving

additional attention and accounting for higher hospitalization charges in the Northwest Region were the charges for colorectal cancer. These charges of over \$85 million far exceeded all other regions (ranging from \$13 to \$24 million), including the Central Region which actually had a higher number of colorectal cancer hospital stays. Future studies should focus on disparities in hospitalization charges in the Northwest Region, with an emphasis on colorectal cancer. Possible areas to consider include issues related to length of stay, type of operation, and the routine care given to patients. Additionally, what are the factors influencing lower hospital charges in other health planning regions, especially the Eastern Region. It is important to note again that severity of cancer was not available in the database.

While Medicare was the primary payer source for the Black and White patients, private insurance was the primary payer source for Asian, Hispanic, and Other patients. This may reflect immigration and migratory status of Hispanic patients. It certainly reflects differences in how health services are paid for by different ethnic groups.

The LOS, PRLOS, and PSLOS were all longer for African-American patients than White patients. A longer PRLOS could indicate that African-Americans with cancer had to have a longer hospital preparation before primary services could be administered. It would also be important to explore if African-American patients were sicker on arrival and needed more time to be stabilized before more advanced primary procedures could be performed. A longer PSLOS could indicate that African-American patients

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had more intensive procedures requiring a longer recovery time. It could also indicate that African-American patients require a longer time to recover than White patients with cancer for similar procedures.

In terms of healthcare expenditure, operating room charges were higher for White patients and African-American patients than they were for Asian patients and Hispanic patients. The higher room and board charges for African-American patients may be related to longer LOS, PRLS, and PSLOS. Routine care charges were highest for White patients and lowest for African-American patients. Other studies have shown where African-Americans have been less likely to receive many types of medical services and procedures (Ayanian, Udvarhelyi, Gatsonis, Pashos, Epstein, 1993). A later study found that doctors whose patient panel was predominantly black reported more challenges to accessing specialists, diagnostic imaging, and ancillary services of high-quality, and non-emergency admission to the hospital for their patients (Bach, Pham, Schrag, Tate, & Hargraves, 2004). Additionally, a study on a 10-year trend found that the use of high-cost surgical procedures was significantly lower for African-American patients than White patients (Jha, Fisher, Li, Orav, & Epstein, 2005). The healthcare expenditure findings in this study could reflect the differences in services given ethnic minority groups, which may not be top of the line, and therefore, cost less, or simply ancillary services that were not provided. Also for consideration in future studies are the possible roles that such issues as cultural mistrust and divine will may have on the decisions of African-American to refuse some opera-

tions, medical services, and procedures. Additionally, culturally-related health behaviors must also be explored for other ethnic minority populations.

In terms of routine care, a study found that African-Americans receive poorer quality of care than White-Americans even when enrolled in managed care health plans (Schneider, Zaslavsky, & Epstein, 2002). Routine hospital care, reflecting the amount of precautionary attention given patients, may be less for ethnic minority groups and lowest for African-Americans. African-Americans patients with cancer were more likely to be admitted to the hospital from the emergency room than all other racial groups. This could reflect access to primary care, priority given to the illness, or lack of professional supervision when debilitating symptoms are on the rise.

A strength of this study was a sample size that allowed for multiple analyses. Other strengths included data collection at the individual level, working with an established data set, having the ability to run multiple risk factors, and being able to generate additional hypotheses for future studies. Study limitations included the limited number of variables available in the data set, including the inability to look at charges by severity of cancer, the accuracy of the person coding the information, and a lack of information regarding knowledge, beliefs and attitudes towards healthcare of the patients, and employment status. The study was also limited by small sample sizes for some of the ethnic groups. Future studies may choose to include, multiple years of data, more sophisticated analyses such as case mix adjustment, and more analyses related to insurance status.

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## CONCLUSION

**H**ospitalization charges for cancer as a primary diagnosis in adults in Virginia increased by \$33 million dollars from 2002 to 2003, despite 1410 fewer hospital stays. Race contributed significantly to healthcare expenditure and utilization for patients with cancer in Virginia. Race when age-adjusted contributed significantly to admission to the hospital from the emergency room and total length of stay. Furthermore, it is possible that while in the hospital, less care was given to ethnic minority patients that may have accounted for lower routine care charges, despite longer PRLOS and PSLOS. Efforts to increase the level of service delivery, both before entering the hospital by way of the emergency room and while in the hospital as indicated by the level of routine care must be made to eliminate racial disparities in healthcare among patients with cancer in Virginia. Additionally, disparities in colorectal cancer hospital charges in the Northwest Health Planning Region, accounting for 54 percent of the state's total hospital charges for colorectal cancer and higher hospitalization charges for five of six specific cancer types, need further exploration.

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## APPENDIX OF TABLES

**Table 1. Cancer-Related Hospitalizations and Charges among Adults in Virginia, 2003**

	Number of Stays	Total Hospital Days	Average Days Per Stay	Median Days Per Stay	Total Charges	Average Charges Per Stay*	Median Charges Per Stay*
All Hospital Stays	859,252	-	-	-	-	-	-
All Cancer Stays	40,253	-	-	-	978,468,000*	-	-
Non-Cancer Adult Stays	674,342	3,264,180	4.94	3.00	\$11,373,858,000*	\$17,000	\$10,000
Cancer Adult Stays	37,730	258,725	6.94	5.00	\$921,308,279	\$24,000	\$16,000
All Adult Hospital Stays	712,072	3,522,905	5.04	3.00	\$12,295,166,000*	\$17,000	\$10,000

Notes: Cancer defined as ICD-9, 140-208. Cancer cases include primary and secondary diagnoses.

\*Numbers rounded.

**Table 2. Cancer-Related Hospitalization Usage and Charges among Adults in Virginia by Type of Cancer, 2003**

	Principal or Secondary Diagnosis	Principal Diagnosis	Secondary Diagnosis
<b>Any Cancer (ICD 140-208*)</b>			
Number of Stays	37,730	25,934	11,796
Patient Days	258,725	189,638	69,087
Average Length of Stay	6.94	7.39	5.95
Median Length of Stay	5.00	5.00	4.00
Total Charges	\$921,308,279	\$703,852,607	\$217,455,672
Average Charge Per Stay	\$24,430	\$27,153	\$18,444
Median Charge Per Stay	\$15,766	\$17,966	\$11,324
<b>Lung Cancer (ICD 162-3)</b>			
Number of Stays	6,375	3,449	2,926
Patient Days	45,382	26,987	18,395
Average Length of Stay	7.12	7.83	6.29
Median Length of Stay	5.00	6.00	4.00
Total Charges	\$151,530,083	\$95,847,753	\$55,682,330
Average Charge Per Stay	\$23,305	\$27,076	\$18,799
Median Charge Per Stay	\$15,367	\$19,131	\$12,408
<b>Colorectal Cancer (ICD 153-4,159)†</b>			
Number of Stays	3,820	2,864	956
Patient Days	32,040	26,592	5,448
Average Length of Stay	8.45	9.32	5.80
Median Length of Stay	7.00	7.00	4.00
Total Charges	\$112,360,772	\$95,443,914	\$16,916,858
Average Charge Per Stay	\$29,460	\$33,384	\$17,714
Median Charge Per Stay	\$20,598	\$23,490	\$11,062
<b>Prostate Cancer (ICD 185)</b>			
Number of Stays	1,854	1,658	196
Patient Days	6,519	5,675	844
Average Length of Stay	3.54	3.44	4.31
Median Length of Stay	3.00	3.00	3.00
Total Charges	\$31,405,651	\$28,798,971	\$2,606,680
Average Charge Per Stay	\$16,939	\$17,370	\$13,299
Median Charge Per Stay	\$15,221	\$15,575	\$9,203
<b>Cervical Cancer (ICD 180)</b>			
Number of Stays	315	281	34
Patient Days	1,183	1,067	116
Average Length of Stay	3.84	3.88	3.52
Median Length of Stay	3.00	3.00	3.00
Total Charges	\$5,389,513	\$4,939,235	\$450,278
Average Charge Per Stay	\$17,164	\$17,640	\$13,244
Median Charge Per Stay	\$14,039	\$14,538	\$8,683
<b>Skin Cancer (ICD 172)</b>			
Number of Stays	85	61	24
Patient Days	376	223	153
Average Length of Stay	4.59	3.78	6.65
Median Length of Stay	3.00	3.00	3.00
Total Charges	\$1,282,239	\$898,172	\$384,067
Average Charge Per Stay	\$15,085	\$14,724	\$16,003
Median Charge Per Stay	\$13,054	\$13,219	\$12,341
<b>Breast Cancer (ICD 174-5)</b>			
Number of Stays	2034	1744	290
Patient Days	5,991	4,846	1,145
Average Length of Stay	2.98	2.81	3.99
Median Length of Stay	2.00	2.00	3.00
Total Charges	\$31,540,382	\$27,663,536	\$3,876,846
Average Charge Per Stay	\$15,507	\$15,862	\$13,368
Median Charge Per Stay	\$12,034	\$12,610	\$8,087

\*Excluding ICD 202.2,202.3,202.5, 202.6. †Excluding ICD 154.3

**Table 3. Age, Gender and Ethnicity of Patients Hospitalized with Cancer in Virginia, 2003**

	Any Cancer (ICD 140-208*)		Lung Cancer (ICD 162-3)		Colorectal Cancer (ICD 153-4,159†)		Prostate Cancer (ICD 185)		Cervical Cancer (ICD 180)		Skin Cancer (ICD 172)		Breast Cancer (ICD 174-5)	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
<b>Age</b>														
18-27	602	1.60	13	0.20	9	0.24	0	0.00	8	2.54	0	0.00	12	0.59
28-37	1,107	2.93	32	0.49	41	1.07	1	0.05	66	20.95	1	1.18	74	3.64
38-47	3,200	8.48	340	5.23	309	8.09	47	2.54	83	26.35	8	9.41	326	16.03
48-57	6,771	17.95	995	15.30	567	14.84	402	21.68	68	21.59	19	22.35	519	25.52
58-67	9,336	24.74	1,836	28.22	893	23.38	761	41.05	40	12.70	23	27.06	424	20.85
68+	16,714	44.30	3,289	50.56	2,001	52.38	643	34.68	50	15.87	34	40.00	679	33.38
<b>Total</b>	<b>37,730</b>	<b>100.00</b>	<b>6,505</b>	<b>100.00</b>	<b>3,820</b>	<b>100.00</b>	<b>1,854</b>	<b>100.00</b>	<b>315</b>	<b>100.00</b>	<b>85</b>	<b>100.00</b>	<b>2,034</b>	<b>100.00</b>
<b>Gender</b>														
Female	19,254	51.03	2,866	44.06	1,982	51.88	0	0.00	315	100.00	30	35.29	2,019	99.26
Male	18,474	48.97	3,639	55.94	1,838	48.12	1,854	100.00	0	0.00	55	64.71	15	0.74
<b>Total</b>	<b>37,728</b>	<b>100.00</b>	<b>6,505</b>	<b>100.00</b>	<b>3,820</b>	<b>100.00</b>	<b>1,854</b>	<b>100.00</b>	<b>315</b>	<b>100.00</b>	<b>85</b>	<b>100.00</b>	<b>2,034</b>	<b>100.00</b>
<b>Ethnicity</b>														
Asian	542	1.47	57	0.89	47	1.26	20	1.11	5	1.64	0	0.00	24	1.20
Black	7,545	20.49	1,252	19.53	823	22.06	437	24.25	83	27.21	4	4.82	450	22.49
Hispanic	411	1.12	36	0.56	43	1.15	8	0.44	15	4.92	0	0.00	25	1.25
White	28,054	76.17	5,044	78.67	2,794	74.91	1,326	73.58	201	65.90	78	93.98	1,488	74.36
Other	278	0.75	23	0.36	23	0.62	11	0.61	1	0.33	1	1.20	14	0.70
<b>Total</b>	<b>36,830</b>	<b>100.00</b>	<b>6,412</b>	<b>100.00</b>	<b>3,730</b>	<b>100.00</b>	<b>1,802</b>	<b>100.00</b>	<b>305</b>	<b>100.00</b>	<b>83</b>	<b>100.00</b>	<b>2,001</b>	<b>100.00</b>

\*Excluding ICD 202.2,202.3,202.5, 202.6. †Excluding ICD 154.3

Note: Cancer cases include primary and secondary diagnoses

**Table 4. Total Charges of Adults Hospitalized with Cancer in Virginia by Age, Gender, and Ethnicity, 2003**

	Any Cancer (ICD 140-208*)		Lung Cancer (ICD 162-3)		Colorectal Cancer (ICD 153-4,159†)		Prostate Cancer (ICD 185)		Cervical Cancer (ICD 180)		Skin Cancer (ICD 172)		Breast Cancer (ICD 174-5)	
	Charge (x 1,000)	%	Charge (x 1,000)	%	Charge (x 1,000)	%	Charge (x 1,000)	%	Charge (x 1,000)	%	Charge (x 1,000)	%	Charge (x 1,000)	%
<b>Age</b>														
18-27	\$18,366	2.00	\$221	0.10	\$258	0.23	\$0	0.00	\$227	4.21	\$0	0.00	\$214	0.68
28-37	\$31,979	3.47	\$993	0.70	\$808	0.72	\$23	0.07	\$1,113	20.65	\$4	0.32	\$1,351	4.28
38-47	\$83,225	9.03	\$8,194	5.40	\$7,316	6.51	\$1,071	3.41	\$1,382	25.64	\$116	9.13	\$5,704	18.09
48-57	\$161,473	17.53	\$22,464	14.83	\$14,776	13.15	\$6,903	21.97	\$1,225	22.73	\$383	30.16	\$8,661	27.46
58-67	\$229,593	24.92	\$41,559	27.43	\$26,301	23.41	\$13,792	43.90	\$760	14.10	\$349	27.48	\$6,546	20.75
68+	\$396,672	43.05	\$78,100	51.54	\$62,902	55.98	\$9,629	30.65	\$683	12.67	\$418	32.91	\$9,064	28.74
<b>Total</b>	\$921,308	100.00	\$151,531	100.00	\$112,361	100.00	\$31,418	100.00	\$5,390	100.00	\$1,270	100.00	\$31,540	100.00
<b>Gender</b>														
Female	\$457,721	49.68	\$67,054	44.25	\$55,608	49.49	\$0	0.00	\$5,389	100.00	\$483	37.71	\$31,369	99.46
Male	\$463,539	50.32	\$84,476	55.75	\$56,753	50.51	\$31,406	100.00	\$0	0.00	\$799	62.29	\$171	0.54
<b>Total</b>	\$921,260	100.00	\$151,530	100.00	\$112,361	100.00	\$31,406	100.00	\$5,389	100.00	\$1,282	100.00	\$31,540	100.00
<b>Ethnicity</b>														
Asian	\$13,838	1.50	\$1,221	0.81	\$1,047	0.93	\$339	1.08	\$77	1.42	\$0	0.00	\$358	1.14
Black	\$189,410	20.56	\$28,354	18.71	\$25,614	22.80	\$8,274	26.35	\$1,409	26.15	\$30	2.36	\$7,316	23.20
Hispanic	\$10,649	1.16	\$637	0.42	\$1,090	0.97	\$120	0.38	\$217	4.03	\$0	0.00	\$300	0.95
White	\$674,142	73.17	\$118,068	77.92	\$81,236	72.30	\$21,809	69.44	\$3,508	65.09	\$1,192	93.01	\$22,832	72.39
Other	\$7,830	0.85	\$678	0.45	\$450	0.40	\$181	0.58	\$44	0.81	\$12	0.96	\$225	0.71
Unknown	\$25,440	2.76	\$2,571	1.70	\$2,924	2.60	\$680	2.17	\$135	2.50	\$471	3.67	\$509	1.62
<b>Total</b>	\$921,309	100.00	\$151,530	100.00	\$112,361	100.00	\$31,403	100.00	305	100.00	83	100.00	2001	100.00

\*Excluding ICD 202.2,202.3,202.5, 202.6. †Excluding ICD 154.3 ‡Excluding patients with unknown gender

Note: Cancer cases include primary and secondary diagnoses

**Table 5. Cancer-Related Hospitalization Charges among Adults in Virginia by Health Planning Region and Type of Cancer, 2003**

Health Planning Region		All Cancers	Lung Cancer	Colorectal Cancer	Prostate Cancer	Cervical Cancer	Skin Cancer	Breast Cancer
<b>1 Eastern Region</b>	Hospitalizations (N)	5,816	991	613	246	36	16	309
	Charges (x \$1,000)	\$107,557	\$16,321	\$12,935	\$3,212	\$558	\$178	\$3,157
	% of Total Charges	12.30%	11.36%	8.18%	10.63%	10.71%	14.72%	10.51%
<b>2 Southwest Region</b>	Hospitalizations (N)	6,308	895	579	291	49	8	284
	Charges (x \$1,000)	\$150,246	\$20,836	\$16,154	\$4,193	\$638	\$209	\$4,302
	% of Total Charges	17.18%	14.49%	10.22%	13.88%	12.24%	17.29%	14.32%
<b>3 Northern Region</b>	Hospitalizations (N)	7,317	1,334	737	270	68	16	404
	Charges (x \$1,000)	\$147,437	\$25,351	\$18,960	\$3,827	\$986	\$192	\$5,263
	% of Total Charges	16.86%	17.63%	11.99%	12.67%	18.92%	15.89%	17.52%
<b>4 Northwest Region</b>	Hospitalizations (N)	7,779	1,395	800	557	56	21	470
	Charges (x \$1,000)	\$253,565	\$43,530	\$85,628	\$11,386	\$1,538	\$300	\$10,066
	% of Total Charges	29.00%	30.27%	54.17%	37.70%	29.51%	24.81%	33.51%
<b>5 Central Region</b>	Hospitalizations (N)	8,557	1,568	898	407	93	20	453
	Charges (x \$1,000)	\$215,618	\$37,744	\$24,402	\$7,587	\$1,491	\$330	\$7,252
	% of Total Charges	24.66%	26.25%	15.44%	25.12%	28.61%	27.30%	24.14%
<b>Total</b>	Hospitalizations (N)	35,777	6,183	3,627	1,771	302	81	1,920
	Charges (x \$1,000)	\$874,423	\$143,782	\$108,081	\$30,204	\$5,211	\$1,209	\$30,039
	% of Total Charges	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Notes: Hospitalizations with unknown zip codes were excluded. Cancer cases include primary and secondary diagnoses.

**Table 6. Hospitalization Charges of Cancer Patients in Virginia by Age and Primary Payer Source, 2003**

	Medicare (x \$1,000)	Medicare (x \$1,000)	Private Insurance (x \$1,000)	Self-pay (x \$1,000)	All Others (x \$1,000)	Total (x \$1,000)
<b>Any Cancer (ICD 140-208*)</b>						
18-27 years	\$1,399	\$3,058	\$13,225	\$1,103	\$840	\$18,366
28-37 years	\$1,880	\$4,797	\$21,824	\$1,896	\$1,583	\$31,979
38-47 years	\$5,135	\$10,045	\$60,489	\$3,824	\$3,733	\$83,225
48-57 years	\$13,650	\$10,884	\$124,440	\$7,035	\$5,464	\$161,473
58-67 years	\$76,652	\$18,368	\$122,418	\$8,167	\$3,989	\$229,593
68+ years	\$345,266	\$30,422	\$17,296	\$699	\$2,987	\$396,671
<b>Total</b>	<b>\$442,721</b>	<b>\$77,574</b>	<b>\$359,692</b>	<b>\$22,725</b>	<b>\$18,597</b>	<b>\$921,308</b>
<b>Percent</b>	<b>48.05%</b>	<b>8.42%</b>	<b>39.04%</b>	<b>2.47%</b>	<b>2.02%</b>	<b>100.00%</b>
<b>Lung Cancer (ICD 162-3)</b>						
18-27 years	\$0	\$0	\$191	\$30	\$0	\$221
28-37 years	\$58	\$293	\$584	\$59	\$0	\$993
38-47 years	\$774	\$1,220	\$5,148	\$551	\$501	\$8,194
48-57 years	\$2,324	\$1,888	\$16,206	\$1,119	\$928	\$22,463
58-67 years	\$16,626	\$3,150	\$19,732	\$1,144	\$907	\$41,559
68+ years	\$70,176	\$4,349	\$2,805	\$154	\$617	\$78,100
<b>Total</b>	<b>\$89,957</b>	<b>\$10,899</b>	<b>\$44,666</b>	<b>\$3,056</b>	<b>\$2,953</b>	<b>\$151,530</b>
<b>Percent</b>	<b>59.37%</b>	<b>7.19%</b>	<b>29.48%</b>	<b>2.02%</b>	<b>1.95%</b>	<b>100.00%</b>
<b>Colon Cancer (ICD 153-4,159†)</b>						
18-27 years	\$0	\$0	\$178	\$0	\$80	\$258
28-37 years	\$0	\$16	\$720	\$25	\$47	\$808
38-47 years	\$359	\$921	\$5,295	\$568	\$174	\$7,316
48-57 years	\$1,639	\$461	\$11,333	\$741	\$601	\$14,775
58-67 years	\$8,489	\$1,648	\$14,099	\$1,373	\$691	\$26,301
68+ years	\$55,590	\$4,565	\$2,464	\$6	\$276	\$62,902
<b>Total</b>	<b>\$66,076</b>	<b>\$7,612</b>	<b>\$34,090</b>	<b>\$2,714</b>	<b>\$1,868</b>	<b>\$112,361</b>
<b>Percent</b>	<b>58.81%</b>	<b>6.78%</b>	<b>30.34%</b>	<b>1.66%</b>	<b>2.42%</b>	<b>100.00%</b>
18-27 years	\$0	\$0	\$0	\$0	\$0	\$0
28-37 years	\$0	\$0	\$11	\$0	\$0	\$11
38-47 years	\$0	\$0	\$1,049	\$22	\$0	\$1,071
48-57 years	\$139	\$135	\$6,489	\$89	\$52	\$6,903
58-67 years	\$3,244	\$550	\$9,685	\$211	\$103	\$13,792
68+ years	\$8,146	\$555	\$833	\$0	\$96	\$9,629
<b>Total</b>	<b>\$11,529</b>	<b>\$1,238</b>	<b>\$18,066</b>	<b>\$322</b>	<b>\$250</b>	<b>\$31,406</b>
<b>Percent</b>	<b>36.71%</b>	<b>3.92%</b>	<b>57.52%</b>	<b>1.03%</b>	<b>0.80%</b>	<b>100.00%</b>
18-27 years	\$0	\$92	\$135	\$0	\$0	\$227
28-37 years	\$0	\$135	\$878	\$84	\$16	\$1,113
38-47 years	\$43	\$118	\$1,015	\$128	\$178	\$1,381
48-57 years	\$50	\$150	\$764	\$117	\$144	\$1,225
58-67 years	\$265	\$104	\$318	\$72	\$0	\$760
68+ years	\$532	\$101	\$21	\$0	\$28	\$683
<b>Total</b>	<b>\$890</b>	<b>\$701</b>	<b>\$3,131</b>	<b>\$402</b>	<b>\$267</b>	<b>\$5,390</b>
<b>Percent</b>	<b>16.51%</b>	<b>13.01%</b>	<b>58.09%</b>	<b>7.46%</b>	<b>4.95%</b>	<b>100.00%</b>
18-27 years	\$0	\$0	\$0	\$0	\$0	\$0
28-37 years	\$0	\$0	\$0	\$4	\$0	\$4
38-47 years	\$0	\$0	\$128	\$0	\$0	\$128
48-57 years	\$0	\$13	\$312	\$27	\$32	\$383
58-67 years	\$124	\$0	\$196	\$29	\$1	\$349
68+ years	\$333	\$55	\$31	\$0	\$0	\$418
<b>Total</b>	<b>\$456</b>	<b>\$67</b>	<b>\$666</b>	<b>\$59</b>	<b>\$33</b>	<b>\$1,282</b>
<b>Percent</b>	<b>35.57%</b>	<b>5.23%</b>	<b>51.95%</b>	<b>4.60%</b>	<b>2.57%</b>	<b>100.00%</b>
18-27 years	\$0	\$65	\$103	\$46	\$0	\$214
28-37 years	\$44	\$131	\$1,053	\$55	\$69	\$1,351
38-47 years	\$108	\$342	\$4,880	\$163	\$211	\$5,704
48-57 years	\$502	\$564	\$7,200	\$170	\$226	\$8,661
58-67 years	\$2,029	\$483	\$3,650	\$119	\$265	\$6,546
68+ years	\$8,029	\$600	\$352	\$32	\$51	\$9,064
<b>Total</b>	<b>\$10,712</b>	<b>\$2,184</b>	<b>\$17,237</b>	<b>\$585</b>	<b>\$822</b>	<b>\$31,540</b>
<b>Percent</b>	<b>33.96%</b>	<b>9.93%</b>	<b>54.15%</b>	<b>1.86%</b>	<b>2.61%</b>	<b>100.00%</b>

\*Excluding ICD 202.2,202.3,202.5, 202.6. †Excluding ICD 154.3 ‡Excluding patients with unknown gender  
 Note: Cancer cases include primary and secondary diagnoses

**Table 7. Hospitalizations of Cancer Patients by Primary Payer Source and Race Among Adults in Virginia, 2003**

	Medicare		Medicaid		Private		Self-pay		Other		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
Asian	149	27.49%	54	9.96%	295	54.43%	16	2.95%	28	5.17%	542	1.47%
Black	3,522	46.68%	889	11.78%	2,570	34.06%	302	4.00%	262	3.47%	7,545	20.49%
Hispanic	92	22.38%	61	14.84%	179	43.55%	33	8.03%	46	11.19%	411	1.12%
White	13,843	49.34%	2,220	7.91%	10,760	38.35%	526	1.87%	705	2.51%	28,054	76.17%
Other	64	23.02%	41	14.75%	141	50.72%	26	9.35%	6	2.16%	278	0.75%
Total	17,670	47.98%	3,265	8.87%	13,945	37.86%	903	2.45%	1,047	2.84%	36,830	100.00%

Note: Cancer cases include primary and secondary diagnoses

**Table 8. Cancer-Related Hospital Stays among Adults in Virginia by Type of Cancer, 2003**

Length of Stay (Days)	Any Cancer (ICD 140-208*)	Lung Cancer (ICD 162-3)	Colorectal Cancer (ICD 153-4,159†)	Prostate Cancer (ICD 185)	Cervical Cancer (ICD 180)	Skin Cancer (ICD 172)	Breast Cancer (ICD 174-5)
<b>Overall</b>	N=37,730	N=6,505	N=3,820	N=1,854	N=315	N=85	N=2,034
Total Length of Stay	258,725	45,382	32,040	6,519	1,183	376	5,991
Average Length of Stay	6.86	6.98	8.39	3.52	3.76	4.42	2.95
Median Length of Stay	5.00	5.00	7.00	3.00	3.00	3.00	2.00
<b>Pre-Operative</b>	N=13,466	N=2,612	N=1,511	N=194	N=47	N=13	N=223
Total Pre-op Length of Stay	50,847	10,121	5,551	588	135	35	722
Average Pre-op Length of Stay	3.78	3.87	3.67	3.03	2.87	2.69	3.24
Median Pre-op Length of Stay	2.00	3.00	2.00	2.00	2.00	2.00	2.00
<b>Post-Operative</b>	N=27,715	N=4,131	N=3,111	N=1,631	N=273	N=68	N=1,764
Total Post-op Length of Stay	168,090	25,904	23,544	5,037	926	269	4,580
Average Post-op Length of Stay	6.05	6.27	7.57	3.09	3.39	3.96	2.60
Median Post-op Length of Stay	4.00	5.00	6.00	3.00	3.00	3.00	2.00

\*Excluding ICD 202.2,202.3,202.5, 202.6. †Excluding ICD 154.3

Note: Cancer cases include primary and secondary diagnoses

**Table 9. Hospitalization Healthcare Expenditure Among Adults in Virginia by Cancer Type, 2003**

	<b>Any Cancer (ICD 140-208*)</b>	<b>Lung Cancer (ICD 162-3)</b>	<b>Colorectal Cancer (ICD 153-4,159†)</b>	<b>Prostate Cancer (ICD 185)</b>	<b>Cervical Cancer (ICD 180)</b>	<b>Skin Cancer (ICD 172)</b>	<b>Breast Cancer (ICD 174-5)</b>
<b>Total Hospital Charges</b>							
	N=37,712	N=6,502	N=3,814	N=1,854	N=314	N=85	N=2,034
Total Charges (x1,000)	\$921,308	\$151,530	\$112,361	\$31,406	\$5,390	\$1,282	\$31,540
Average Charges (x1,000)	\$24	\$23	\$29	\$17	\$17	\$15	\$16
Median Charges (x1,000)	\$16	\$15	\$21	\$15	\$14	\$13	\$12
<b>Room and Board Charges</b>							
	N=10,704	N=5,742	N=3,616	N=1,776	N=307	N=82	N=1,985
Total Charges (x1,000)	\$28,763	\$16,939	\$12,466	\$2,817	\$562	\$162	\$2,640
Average Charges (x1,000)	\$3	\$3	\$3	\$2	\$2	\$2	\$1
Median Charges (x1,000)	\$1	\$2	\$3	\$1	\$1	\$2	\$0.8
<b>Routine Care Charges</b>							
	N=5,742	N=1,717	N=1,134	N=651	N=83	N=30	N=654
Total Charges (x1,000)	\$15,151	\$2,060	\$1,785	\$398	\$70	\$22	\$344
Average Charges (x1,000)	\$1	\$1	\$2	\$0.6	\$0.8	\$0.7	\$0.5
Median Charges (x1,000)	\$0.5	\$4	\$0.8	\$0.1	\$0.6	\$0.1	\$0.1
<b>Operating Room Charges</b>							
	N=20,823	N=2,773	N=2,759	N=1,572	N=247	N=61	N=1,696
Total Charges	\$118,947	\$12,526	\$17,434	\$10,137	\$1,384	\$359	\$10,553
Average Charges	\$6	\$5	\$6	\$7	\$6	\$6	\$6
Median Charges	\$5	\$3	\$5	\$6	\$5	\$5	\$5

\*Excluding ICD 202.2,202.3,202.5, 202.6. †Excluding ICD 154.3

Note: Cancer cases include primary and secondary diagnoses

**Table 10. Hospitalization Healthcare Utilization and Expenditure by Race in Virginia, 2003**

	Asian		Black		Hispanic		White		Other		Total	P-value	
	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	
<b>Healthcare Utilization</b>													
Overall Length of Stay, days	4.0	7.50	5.0	7.51	5.0	7.76	4.0	6.63	4.0	7.34	5.0	6.86	p < 0.0001*
Pre-operative Length of Stay, days	2.0	3.84	3.0	4.10	3.0	4.02	2.0	3.65	2.0	3.53	2.0	3.78	p < 0.0001*
Post-operative Length of Stay, days	4.0	6.49	4.0	6.54	5.0	6.70	4.0	5.90	4.0	6.56	4.0	6.06	p < 0.0001*
<b>Healthcare Expenditure</b>													
Total Charges (x1,000)	\$16	\$26	\$16	\$25	\$17	\$30	\$16	\$24	\$18	\$28	\$16	\$24	p = 0.004*
Room & Board Charges (x100)	\$17	\$32	\$21	\$32	\$21	\$34	\$20	\$29	\$20	\$32	\$20	\$29	p < 0.0001*
Operating Room Charges (x100)	\$42	\$49	\$47	\$58	\$39	\$46	\$48	\$57	\$50	\$56	\$47	\$57	p < 0.0001*
Routine Care Charges (x100)	\$11	\$23	\$1	\$10	\$14	\$23	\$4	\$13	\$0.9	\$6	\$5	\$14	p < 0.0001*

\* Significant difference between groups at alpha = 0.01 using the Kruskal-Wallis test.

Alpha set a 0.01.

- There were significant differences in overall LOS by race. P<0.0001  
White patients had a significantly shorter length of stay than black patients (p<0.0001). All other comparisons had p-values > 0.01.
- There were significant differences in pre-operative LOS by race. P<0.0001  
White patients had a significantly shorter pre-operative length of stay than black patients (p<0.0001) All other comparisons had p-values > 0.01.
- There were significant differences in post-operative LOS by race. P <0.0001  
White patients had a significantly shorter post-operative length of stay than black patients (p<0.0001) All other comparisons had p-values > 0.01.
- There were significant differences in total charges by race. P=0.004  
White patients had significantly less charges than black patients (p=0.002). All other comparisons had p-values > 0.01.
- There were significant differences in room and board charges by race. P<0.0001  
White patients had significantly less room and board charges than black patients (p<0.0001) and Hispanic patients (p=0.007). All other comparisons had p-values > 0.01.
- There were significant differences in operating room charges by race. P<0.0001  
White patients had significantly more operating room charges than asian patients (p=0.002) and Hispanic patients (p<0.0001). Blacks had significantly more operating room charges than asian patients (p=0.007) and Hispanic patients (p=0.0004).
- There were significant differences in routine care charges by race. P<0.0001  
White patients had significantly more routine care charges than black patients (p<0.0001), Asian patients (p<0.0001), Hispanic patients (p<0.0001) and 'other patients' (p=0.002). Black patients had significantly less routine care charges than Asian patients (p<0.0001) and Hispanic patients (p<0.0001). 'Other' patients had significantly less routine care charges than Hispanic patients (p<0.0001) and asian patients (p<0.0001).

**Table 11. Logistic Regression Model Predicting Hospital Admission by Emergency Room by Race Adjusted for Age in Virginia, 2003**

Characteristic (Reference)	Crude		Adjusted*		Adjusted p-values
	Odds Ratio	95% CI	Odds Ratio	95% CI	
Race (White)					
Asian	1.20	1.0, 1.43	1.34	1.12, 1.60	0.23
Black	1.51	1.45, 1.61	1.60	1.52, 1.69	<0.0001
Hispanic	1.23	1.0, 1.49	1.42	1.16, 1.75	0.08
Other	0.78	0.58, 1.01	0.87	0.66, 1.13	0.003

\* Adjusted for age

**Table 12. Logistic Regression Model Predicting Hospital Admission by Emergency Room by Race Adjusted for Age Categories in Virginia, 2003**

Characteristic (Reference)	Crude		Adjusted*		Adjusted p-values
	Odds Ratio	95% CI	Odds Ratio	95% CI	
Race (White)					
Asian	1.20	1.0, 1.43	1.34	1.12, 1.60	0.23
Black	1.51	1.45, 1.61	1.60	1.52, 1.69	<0.0001
Hispanic	1.23	1.0, 1.49	1.42	1.16, 1.75	0.08
Other	0.78	0.58, 1.01	0.87	0.66, 1.13	0.003
Age (18-27 years)					
28-37 years	1.85	1.43, 2.33	1.84	1.43, 2.38	<0.0001
38-47 years	1.85	1.47, 2.33	1.87	1.49, 2.35	<0.0001
48-57 years	2.00	1.61, 2.50	2.08	1.67, 2.60	0.02
58-67 years	2.13	1.69, 2.63	2.24	1.80, 2.80	0.43
68 + years	3.03	2.44, 3.70	3.24	2.61, 4.03	0.43

\* Adjusted for all other variables in the model.





