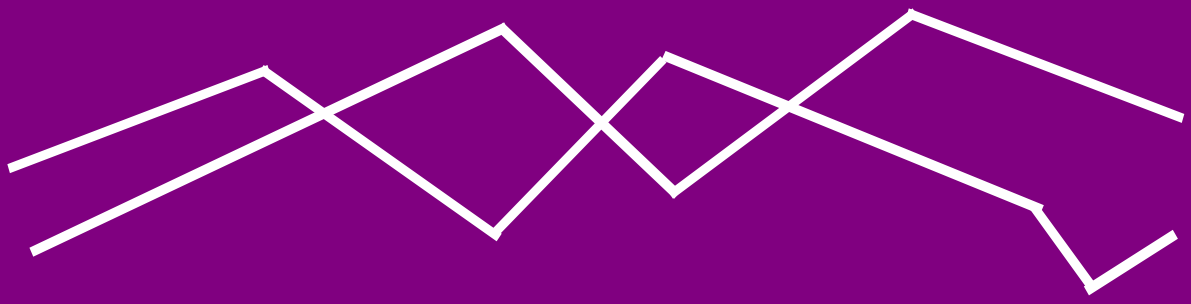

2005

VERMONT HOSPITAL MONOGRAPH COMPANION

A Guide to the 2005 Monograph Series and Analyses of Vermont Hospital Utilization

2005 Vermont Hospital Monograph Companion

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This report is a companion guide to the *Vermont Hospital Monograph Series*. It contains analysis of data about Vermonters hospitalized in Vermont, Massachusetts, New Hampshire and New York. The 2005 Vermont Hospital Monograph Series can be found online at:

http://www.bishca.state.vt.us/HcaDiv/Data_Reports/hospdata/hospital_monograph_series/index_hospital_monograph.htm

This report would not be possible without the accurate reporting of hospital utilization by Vermont's fourteen acute care hospitals, the Veterans Administration Hospital in White River Junction, and organizations in Massachusetts (MA), New Hampshire (NH), and New York (NY) which provide hospital discharge data pertaining to Vermont (VT) residents' use of hospital services in these states.

The Vermont Association of Hospitals and Health Systems-Network Services Organization collect Vermont hospital data under contract with the Vermont Division of Health Care Administration (HCA). Under an agreement with the HCA, the Vermont Department of Health (VDH) receives the data from VAHHS-NSO, merges it with data from MA, NH and NY, and analyzes the data.

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About the Data Used in This Report

Inpatient Data

- **The *Vermont Hospital Monograph Series*** has been published annually in Vermont since 1975.

- **Vermont inpatient data** are for VT residents receiving services at VT acute care hospitals, the VA hospital in White River Junction, and acute care hospitals in MA, NH, or NY.

- **Vermont is compared to the US** in certain charts. The US inpatient data are from the National Hospital Discharge Survey (NHDS) conducted by the U.S. Department of Health and Human Services.

- **Newborn data are excluded,** while maternal records are included, in order to avoid counting hospitalizations for delivery twice. Newborns are defined using Major Diagnostic Category (MDC) 15, Newborns and other neonates with conditions originating in the prenatal period. This is standard practice in hospital utilization analysis.

Outpatient Procedure and Emergency Department (ED) Data

- **New definitions** for outpatient procedure and ED data have been developed.

- **Outpatient procedure records** were previously identified (2001-2002) as records coded by hospitals as patient type A (ambulatory surgery), which had ICD-9-CM procedure codes in the range 0-86.99. Recent analyses have shown that records for patients who received outpatient procedures in the specified ICD-9-CM code range may be found for other patient types, including observation bed, series patient, and ED patient types. This allows for inclusion of more records with outpatient procedures in the outpatient procedure data set.

- **ED records** were previously identified as records coded by hospitals as patient type E (ED visit) plus inpatient records whose admission source was coded as "Emergency Department." Recent analyses have shown that many patients originating in the ED may ultimately be coded as other patient types: inpatient, ambulatory surgery, observation bed, series patient (rarely), and ED. As an alternative approach, records with a revenue code for an ED charge are flagged as ED discharges regardless of the final assignment of patient type. This is a more accurate criterion for identifying records that originated in the ED.

Population Data

- **Vermont population data** are derived from the 1990 and 2000 U.S. Censuses based on estimates produced for the Vermont Department of Health (VDH) by the Center for Rural Studies at the University of Vermont for the intercensal years 1991-1999, and estimates prepared for VDH by Claritas, Inc., for 2001-2002, and estimates created by VDH using adjustments to the National Center for Health Statistics population estimates for 2003-2005.

- **US population data** are from the U.S. Censuses and from Census estimates for July 1 of each intercensal year.

Overview

- **Health Care Spending** increased 7.4 percent in Vermont from 2004 to 2005, totaling approximately $3.6 billion in expenditures. Nationally, health care expenditures increased 6.5 percent in 2005. Health care spending accounted for about 15.8 percent of Vermont's Gross State Product (GSP) in 2005.

- **Vermont's population is aging.** From 1990-2005, the percent of Vermonters aged 45+ continued to grow. This was due in part to the aging of the post World War II Baby Boom generation born between 1946 and 1964. In 1990, none of the Baby Boomers had reached age 45. By 2005, about half were in their upper 40s and 50s. As the Baby Boomers continue to age, the number of older adults with age-related medical problems and chronic diseases is likely to continue to rise rapidly.

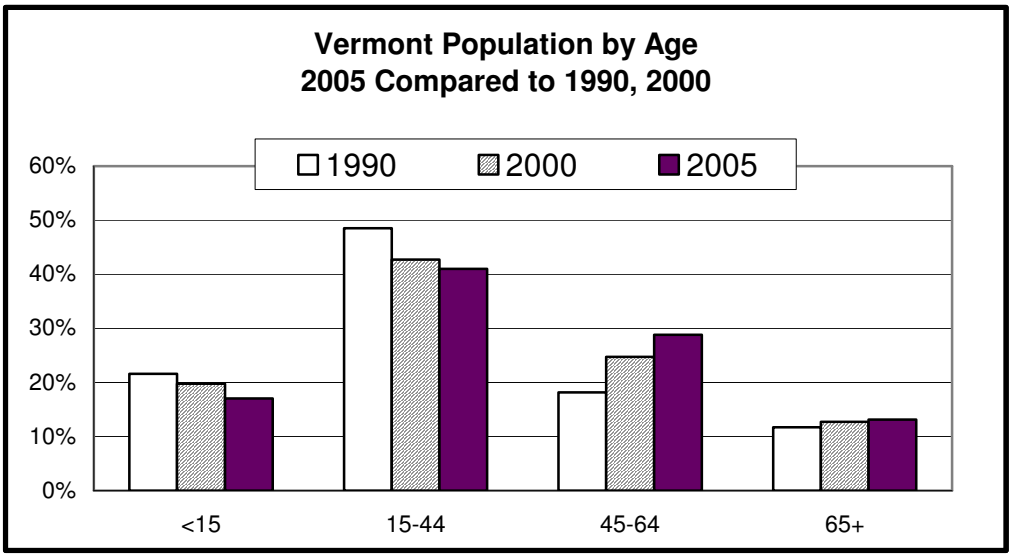


Figure 1 **Data Source: VT Uniform Hospital Discharge Data Set**

- **The Vermont Blueprint for Health Chronic Care Initiative** was launched in the fall of 2003 by Governor James Douglas. It was endorsed by the Vermont General Assembly in 2006 (Act 191). The Blueprint is built on the premise that preventing disease and improving the quality of care for people with chronic illness is effective in reducing the overall demand for higher cost health care services and moderating total health care spending.
  For more information about Vermont's Blueprint for Health, please visit the following sites:
  http://healthvermont.gov/admin/legislature/documents/VTBlueprint2007.pdf
  http://healthvermont.gov/admin/legislature/documents/Blueprint_leg_report.pdf

- **While total hospital revenues continue to rise,** outpatient revenues continue to outpace inpatient revenues**.** Between 1997 and 2005, outpatient revenues increased 213% while inpatient revenues increased 64%. (See Figure 2 on the next page). As published in the *2005 Vermont Hospital Monograph Series* (page 412), the average cost of inpatient hospitalizations in Vermont hospitals for 2005 was $14,353; this is more than four times higher than the average cost for a defined group of outpatient procedures ($3,195) and nearly 20 times more costly than the average emergency department visit that did not result in hospitalization ($736).

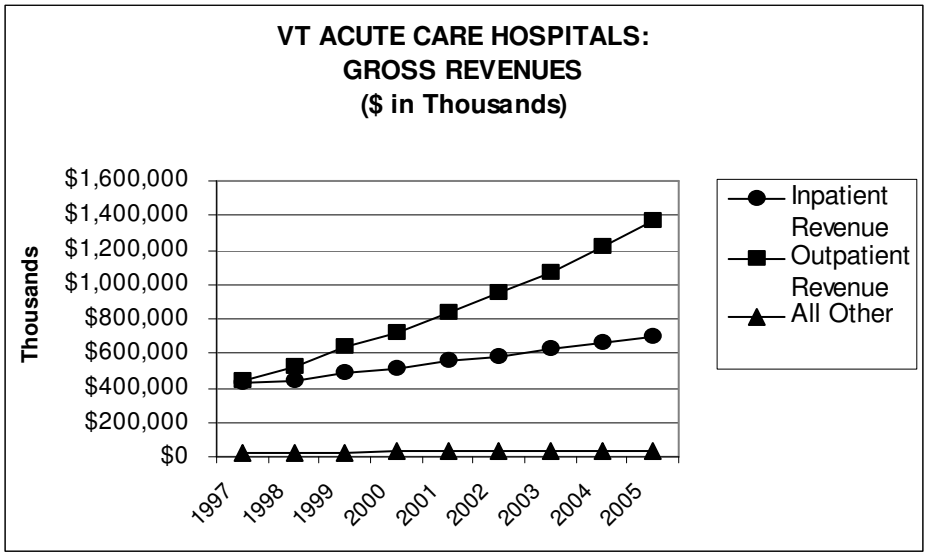


Figure 2 **Data Source: 2005 HCA Annual Budge Submission**.

- **Overall discharges across hospital settings in VT** for Emergency Department and Outpatient services accounted for nearly 86% of all discharges in hospitals across Vermont in 2005. Overall, the percentages among hospital settings have remained steady since 2001.

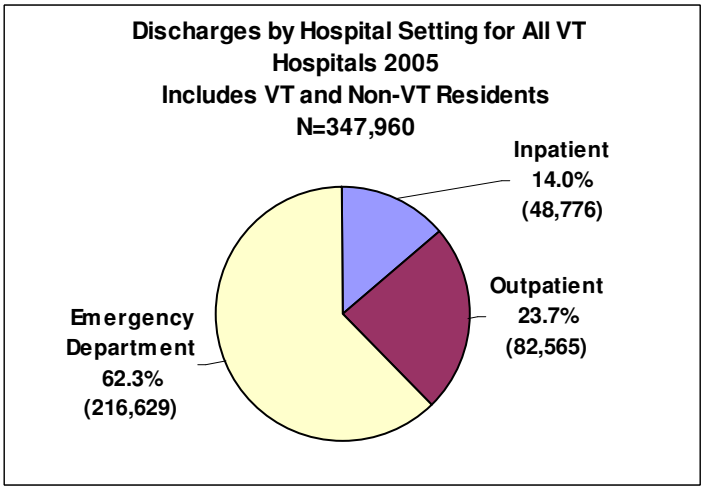


Figure 3 **Data Source: VT Uniform Hospital Discharge Data Set**

In Figure 3:
Inpatient records include maternal records for deliveries but exclude newborn records. Vermont inpatient discharges from the Veterans Administration Hospital in White River Junction are excluded.
Outpatient records include all outpatient records with procedures in the ICD-9-CM code range 00.00-86.9
Outpatient procedure records did NOT originate in the Emergency Department and also do not include outpatient procedures from the Veterans Administration Hospital in White River Junction.
Emergency Department visits originated in the ED, did not result in an inpatient stay and do not include ED data from the Veterans Administration Hospital in White River Junction.

Part I: Inpatient Utilization

Highlights of Vermont Inpatient Utilization

- **In 2005 there was a total of 48,766 inpatient discharges** from Vermont hospitals (excluding the VA hospital and newborn records. These discharges include maternal records for newborn deliveries), and represent Vermont residents and non-residents. There were 2,641 inpatient discharges from VA hospital. Of the total inpatient discharges, almost half originated in the Emergency Department (23,288).

- **Of the 48,766 inpatient discharges from Vermont hospitals,** 41,909 of those were Vermont residents while the remaining 6,857 were non-residents.

- **The bordering states of New Hampshire, New York and Massachusetts reported** that 10,141 Vermont resident discharges for inpatient services occurred at out-of-state hospitals. Most of the out-migration of Vermont residents (6,499 discharges) were from Dartmouth Hitchcock Medical Center in NH and another 1,828 Vermont resident discharges were from other NH hospitals. There were 1,040 Vermont resident discharges from Massachusetts hospitals and 774 from New York area hospitals.

  For more information on in and out migration of Vermont and out-state-residents for inpatient hospital services please see the "Vermont Hospital Migration Report" which can be found at: **http://www.bishca.state.vt.us/HcaDiv/Data_Reports/a_data_reports_index.htm**

- **Inpatient utilization continues to decline.** Despite the aging of Vermont's population, the inpatient hospital discharge rate and average length of stay decreased significantly between 1990 and 2005 (See Figures 4 through 5 on pages 6 and 7). Factors influencing this decline include the continuing shift of treatment and procedures from the inpatient to the outpatient setting and changes in reimbursement and cost-containment strategies.

Part I: Inpatient Utilization

Trends in Utilization: Discharge Rates

The age-adjusted discharge rate measures how often hospital care is provided on a population basis adjusting for differences in age.

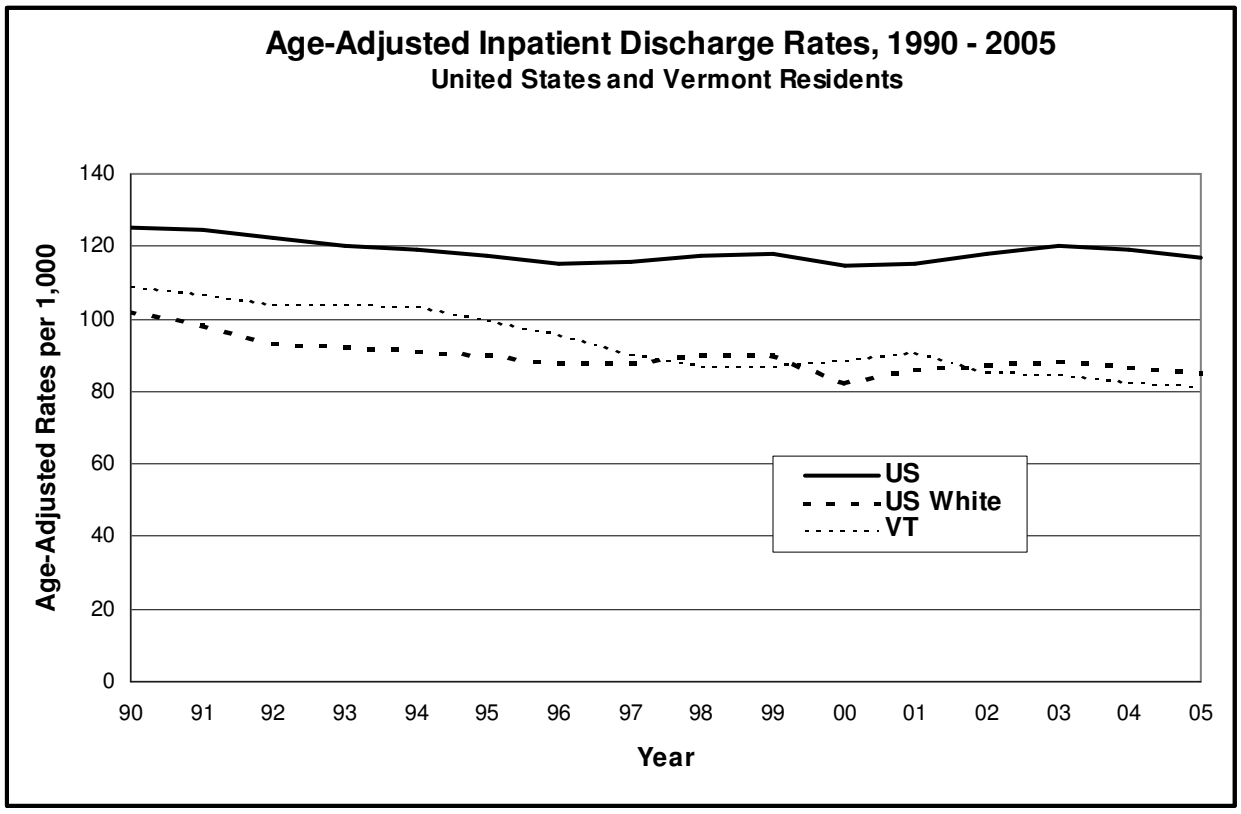


Figure 4

- **The Vermont inpatient discharge rate continues to decline.** Despite the aging of Vermont's population, Vermont's hospitalization rate decreased significantly (-25.0 %) from 1990-2005. The rate also declined from 1990-1999, due in part to the shift of treatment and procedures to the outpatient setting. In 2005, the Vermont rate reached a new low.

- **The Vermont inpatient discharge rates are lower than the U.S. rates.** Vermont's discharge rate was significantly lower than the overall U.S. rate every year from 1990-2005, and slightly lower than U.S. white rate from 2002-2005. Since Vermont's population is less racially diverse than the overall national profile, the U.S. "white" rates are more comparable.

Data Source: VT Uniform Hospital Discharge Data Set
While records for newborn discharges are excluded, maternal records for deliveries are included.

Trends in Utilization: Average Length of Stay

The age-adjusted average length of stay is an approximate measure of the resources used per discharge, adjusting for differences in age.

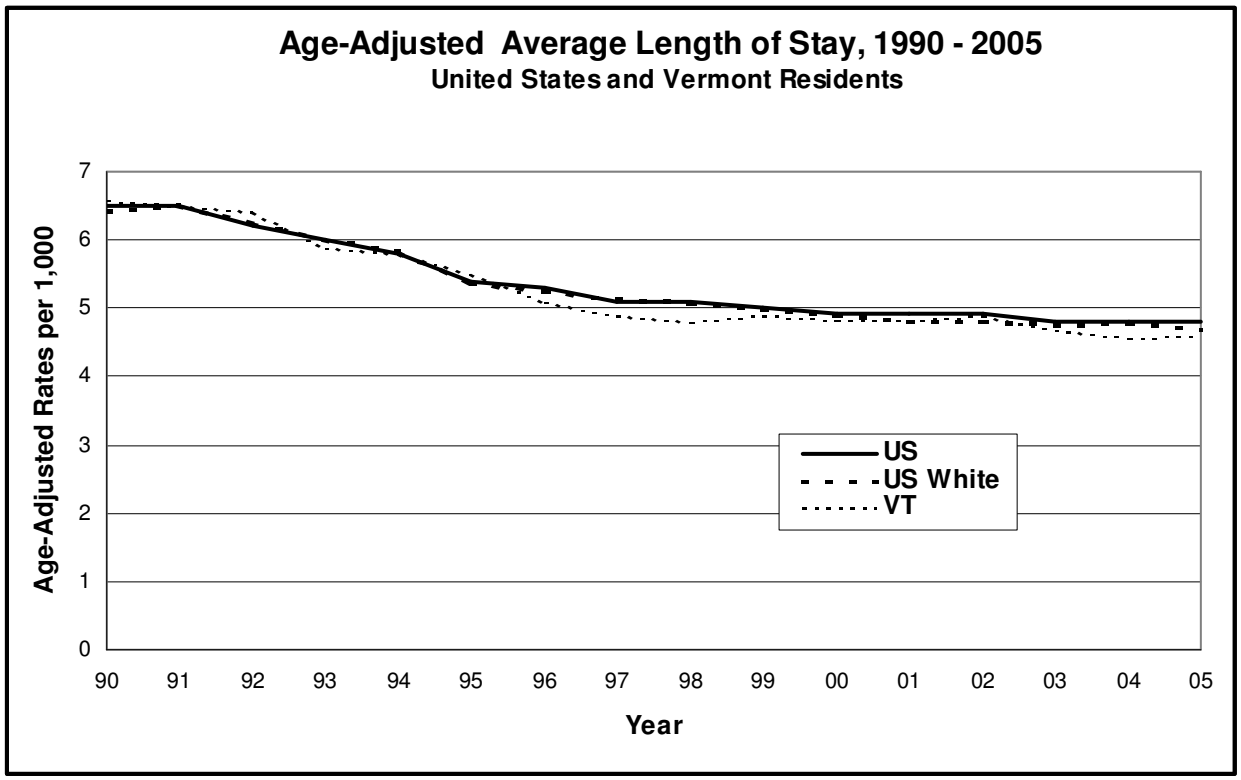


Figure 5

- **Vermont's average length of stay continues to decline.** Vermont's average length of stay dropped significantly (-30.3%) from 1990-2005, probably due in part to reimbursement and cost-containment strategies. Similar drops occurred for the overall US rate (-26.6%) and the US white rate (-26.2%).

Data Source: VT Uniform Hospital Discharge Data Set
While records for newborn discharges are excluded, maternal records for deliveries are included.

Part I: Inpatient Utilization

Patient Characteristics: Variations by Age and Sex

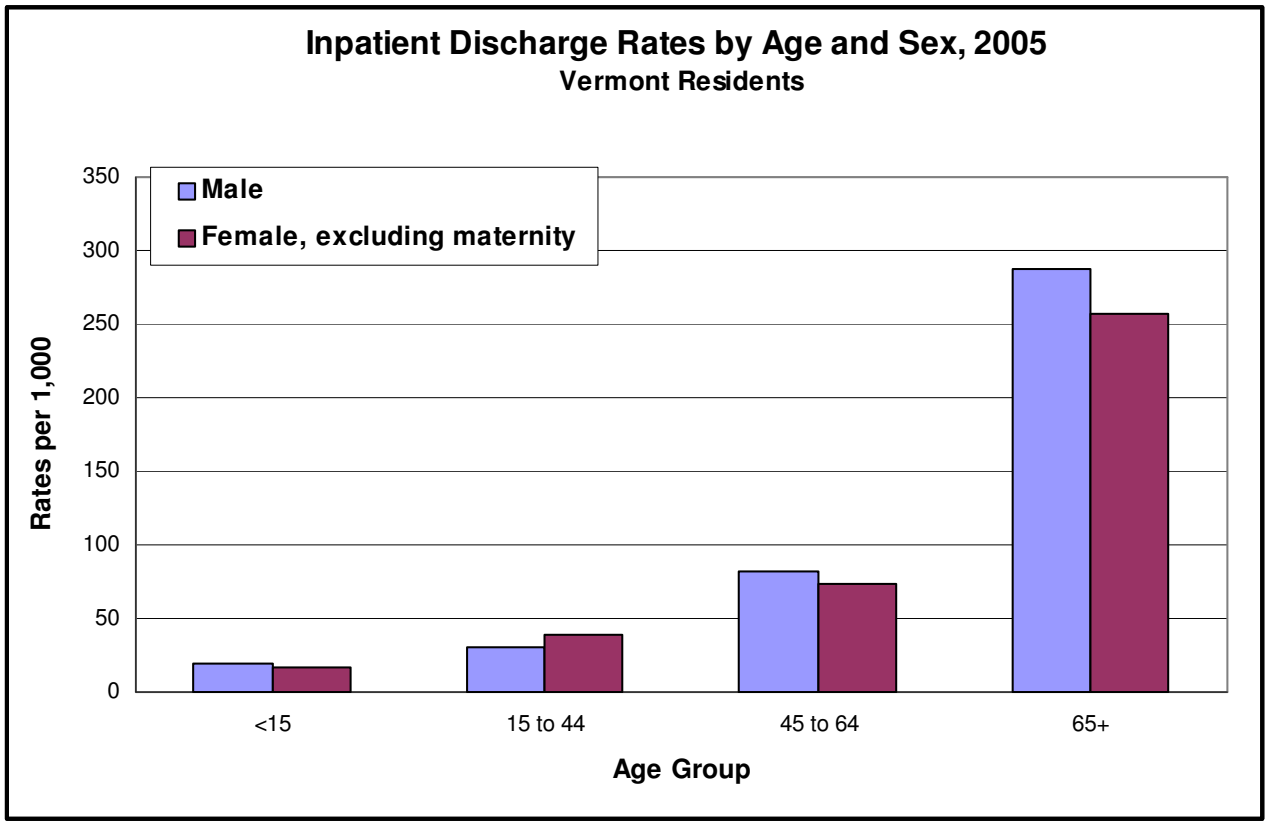


Figure 5

- **Excluding hospitalizations for pregnancy and childbirth,** the hospitalization rate for females is lower than the male rate in all age groups except ages 15-44.

Data Source: VT Uniform Hospital Discharge Data Set
While records for newborn discharges are excluded, maternal records for deliveries are included.

Reason for Hospitalization: Top Five MDCs for Discharges

MDCs (Major Diagnostic Categories) are 25 categories of related diagnoses that collapse 540 more detailed groupings called Diagnosis Related Groups (DRGs).

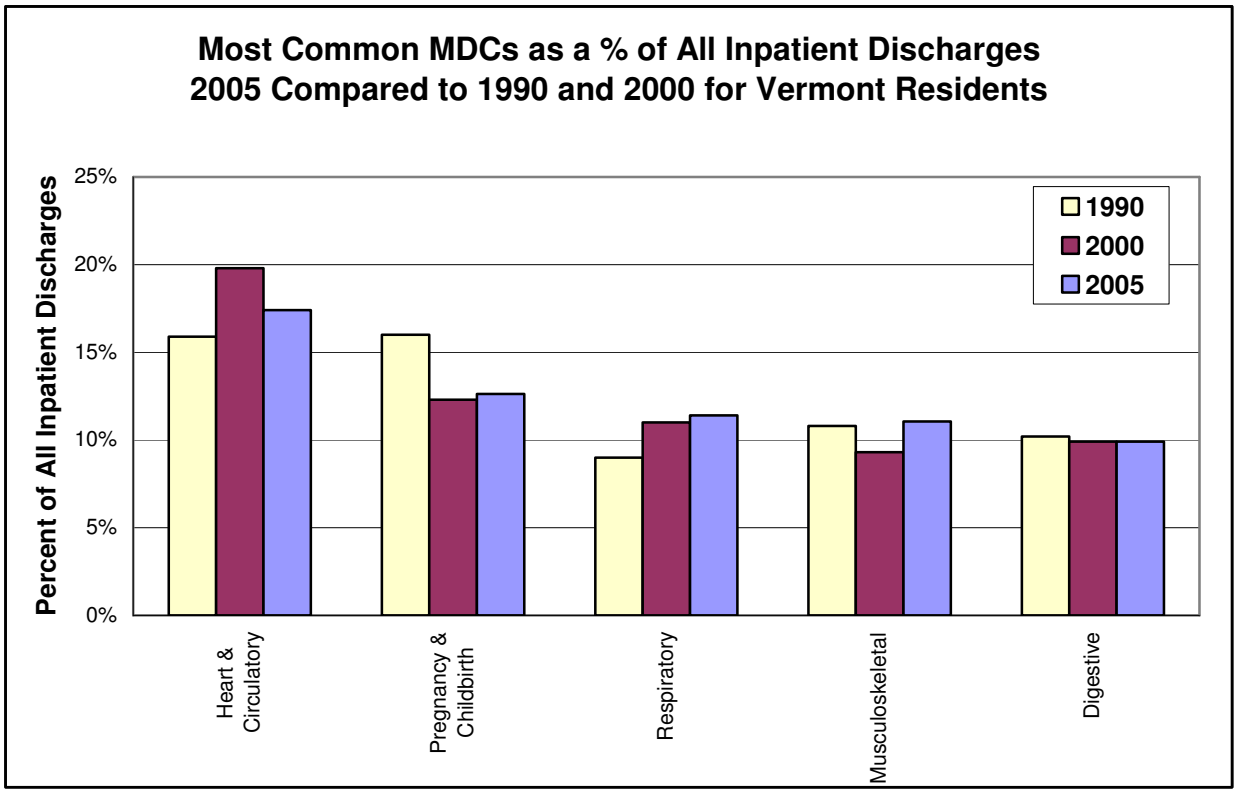


Figure 6

- **These five MDCs** account for approximately 62% of all hospitalizations.

- **Among these five MDCs, the most dramatic changes since 2000** are the continual decreases in Heart & Circulatory and Respiratory hospitalizations and the continual increase in Musculoskeletal hospitalizations.

- **The increase in Musculoskeletal hospitalizations** is due in part, to the introduction of DRG 544 (Major Joint Replacement or Reattachment of the Lower Extremity) in 2005 and accounted for 489 discharges for Vermont Residents. The majority of these discharges were in HSA 2 (Burlington) with just over 100 discharges; while nearly 200 of these discharges occurred in those age 75 or older.

Data Source: VT Uniform Hospital Discharge Data Set
While records for newborn discharges are excluded, maternal records for deliveries are included.

Part I: Inpatient Utilization

Reason for Hospitalization: Top Five MDCs for Average Length of Stay

MDCs (Major Diagnostic Categories) are 25 categories of related diagnoses that collapse 540 more detailed groupings called Diagnosis Related Groups (DRGs).

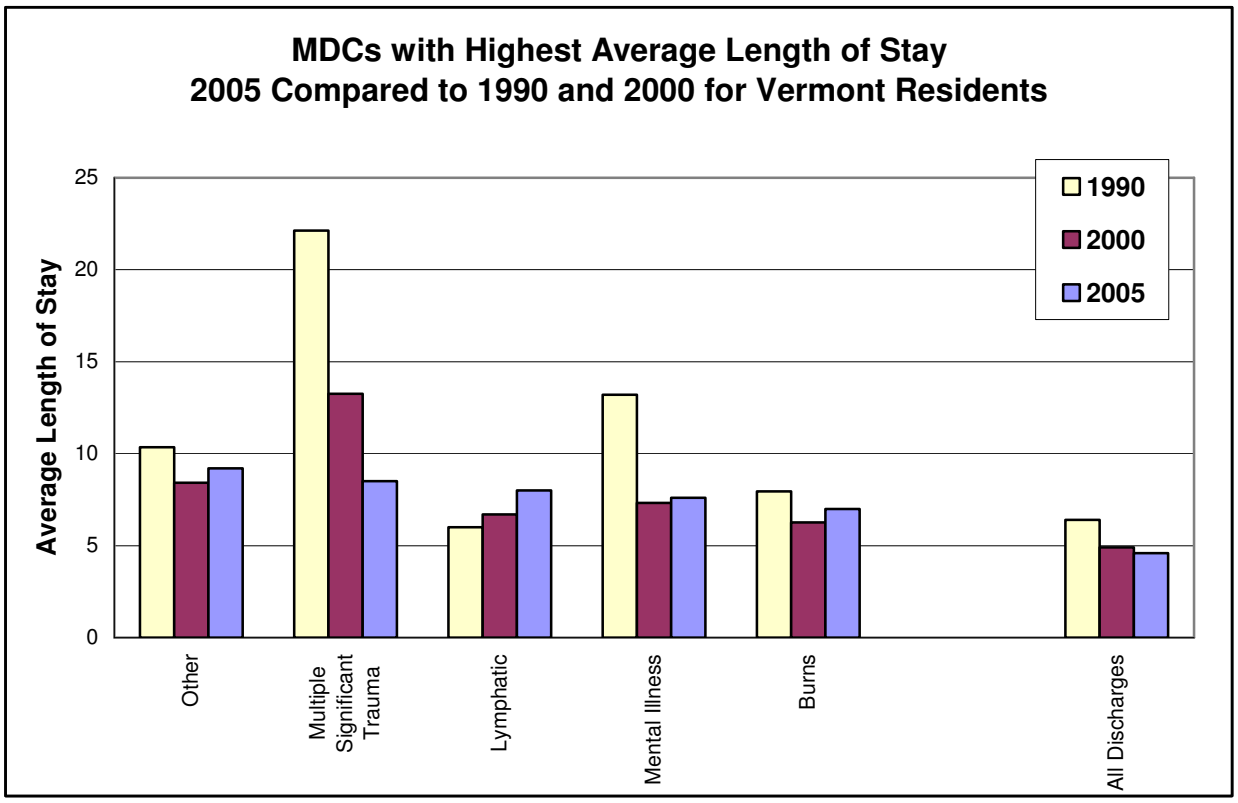


Figure 7

- **Length of stay continues to drop dramatically** for Multiple Significant Trauma (178 discharges in 2004) while at the same time Lymphatic continues to increase in lengths of stay (591 discharges in 2004).

Data Source: VT Uniform Hospital Discharge Data Set
While records for newborn discharges are excluded, maternal records for deliveries are included.

Part II: Outpatient Utilization

- **Sources of Data**

  All fourteen of Vermont's civilian acute care hospitals now submit outpatient data to the hospital discharge reporting system. Data for Vermont residents having outpatient procedures in New Hampshire and New York have been available since 2001 and 2004 respectively. These data are received from the New Hampshire Department of Health and Human Services and New York Department of Health. Outpatient procedure data are not yet available from Massachusetts. In 2001, the Veterans Administration Hospital in White River Junction also began participating in the outpatient dataset.

  Since the other states apply different criteria for the identification of outpatient records, the outpatient records for Vermont residents who received care in hospitals in New Hampshire and New York are not included this companion, but are included in the Vermont Uniform Hospital Discharge Data Set to support public health research as needed by BISHCA and VDH.

- **Outpatient Procedures**

  Hospitals report procedures using the International Classification of Disease Codes (9^{th} Revision, Clinical Modification – ICD-9-CM). Although up to twenty procedures can be listed on every outpatient discharge record, only the first procedure code referred to as the primary procedure (within the ICD-9-CM range 00.0-86.99) is analyzed in the monograph and companion in the Outpatient Procedures section.

- **Recent Changes in Definition of Outpatient Procedures**

  As outpatient data collection evolves, the definition of outpatient procedures will be revised to include new categories to improve reporting and analyses. In 2003, two changes were made to the records selected for inclusion in the outpatient procedures data set. In addition to those records coded as ambulatory surgery (patient type "A"), records with other patient types were included if they had a primary procedure code in the defined range. At the same time, records that originated in the Emergency Department (ED) were excluded from the Outpatient Procedures category and included in the ED category even if they had a primary procedure coded in the defined range.

- **Comparison to Previous Monographs**

  Although data from 2001 are included in this companion, the 2005 outpatient procedure data are not totally comparable to the data published in the 2002 and earlier monographs and companions. While the number of outpatient procedure records did not change much over time, the change in selection criteria as described above resulted in a difference in the type of records included and in the categorization of records.

Part II: Outpatient Utilization

- **In 2005 there was a total of 99,301 outpatient discharges** from Vermont hospitals (not including the VA hospital) that included both Vermont residents and non-residents. Only 16% of outpatient discharges originated in the Emergency Department and these were ultimately categorized as ED records in the Vermont Uniform Hospital Discharge Data Set and not as Outpatient Procedure records.

- **Of the 82,565 outpatient discharges** that did not originate in the Emergency Department in Vermont Hospitals, 74,761 or 90.5% of those were Vermont residents while the remaining 7,804 were out-of-state residents.

- **New Hampshire and New York reported 11,398 Vermont resident** outpatient discharges from out-of-state hospitals. The majority (7,776) of Vermont resident outpatient discharges were from Dartmouth Hitchcock Medical Center in NH and another 3,109 from other NH hospitals. There were another 497 Vermont resident discharges from New York hospitals. Massachusetts did not have data available for Vermont resident outpatient discharges. Unlike the inpatient discharge data, outpatient discharge data from other states is not directly comparable to Vermont hospital data due to differences in how outpatient services are defined in different data collection efforts.

Patient Characteristics: Variations by Age and Sex

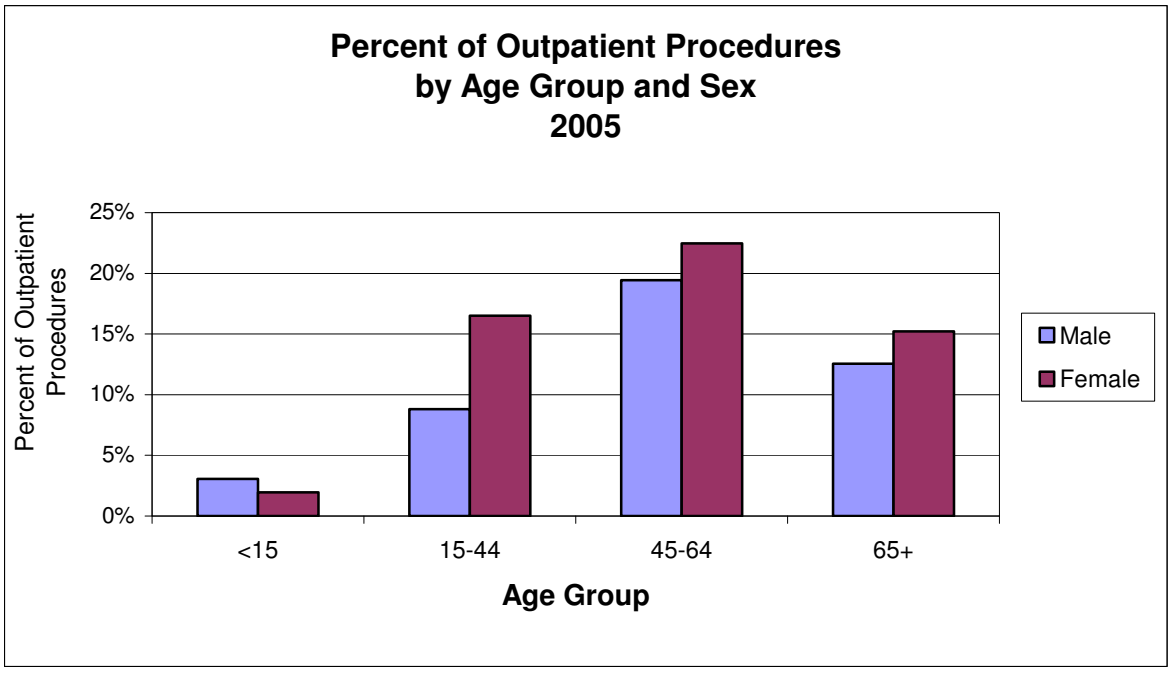


Figure 8

- **Overall, the** 45-64 age group accounted for the highest share (42% of the total) of outpatient procedures.

- **Females** account for a higher rate of outpatient procedures than males except in the <15 age group

- **Most of the difference in the outpatient procedures** rate between male and female in the 15-44 age group is attributed to obstetric and gynecologic procedures.

Data Source: VT Uniform Hospital Discharge Data Set

Part II: Outpatient Utilization

Top ICD-9-CM Outpatient Procedure Groups for Residents and Non-Residents Using Vermont Hospitals

Hospitals report procedures using the International Classification of Disease Codes (9th Revision Clinical Modification, ICD-9-CM). Although up to 20 procedures can be listed on every outpatient discharge record, only the primary procedure code that is in the ICD-9-CM range 00.0-86.99 is included in the outpatient procedure analyses.

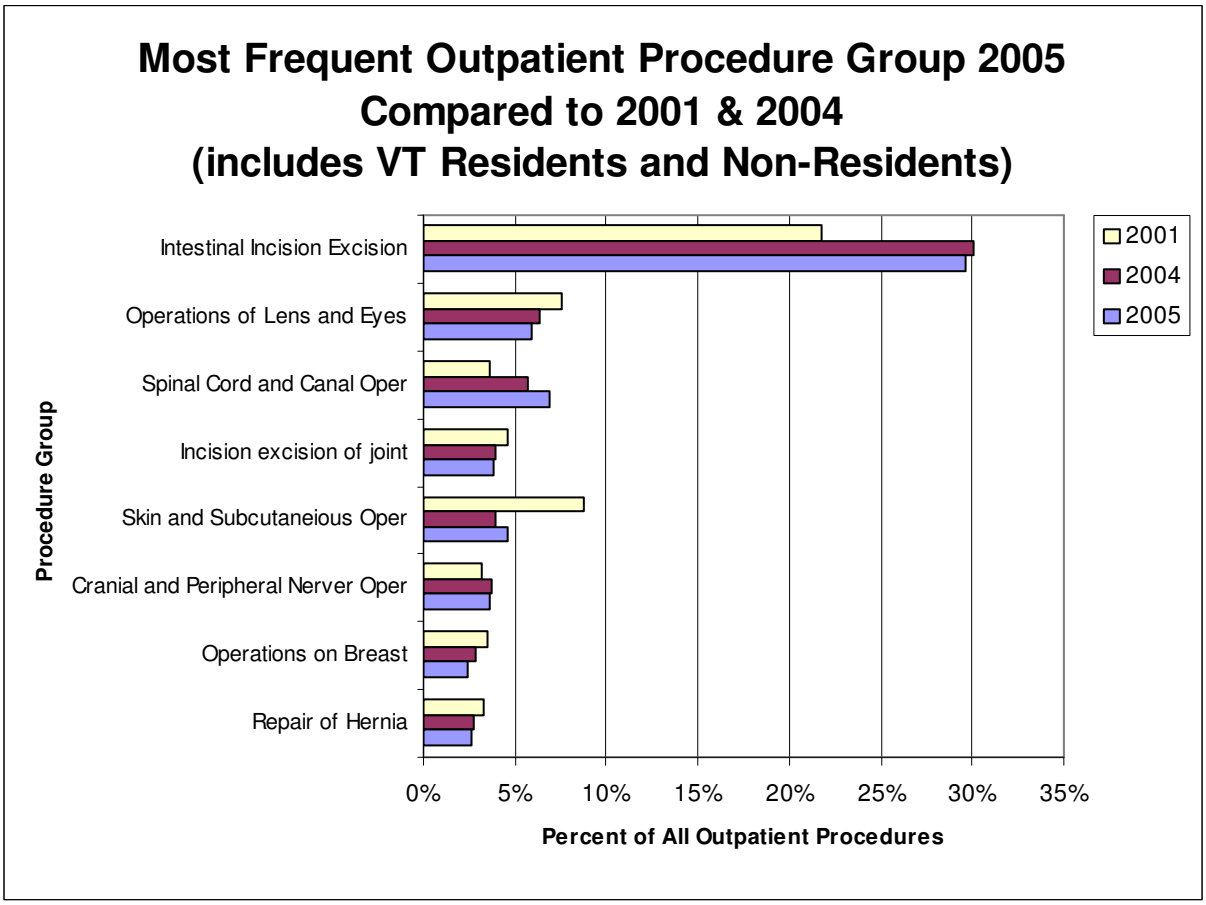


Figure 9

- **Intestinal Incision and Excision continued** to be the most frequent procedure group in 2005 at a little less than 30%. The other seven procedure groups accounted for less than 10% of discharges per group.

Data Source: VT Uniform Hospital Discharge Data Set

Hospital Trends: Outpatient Procedures by Hospital

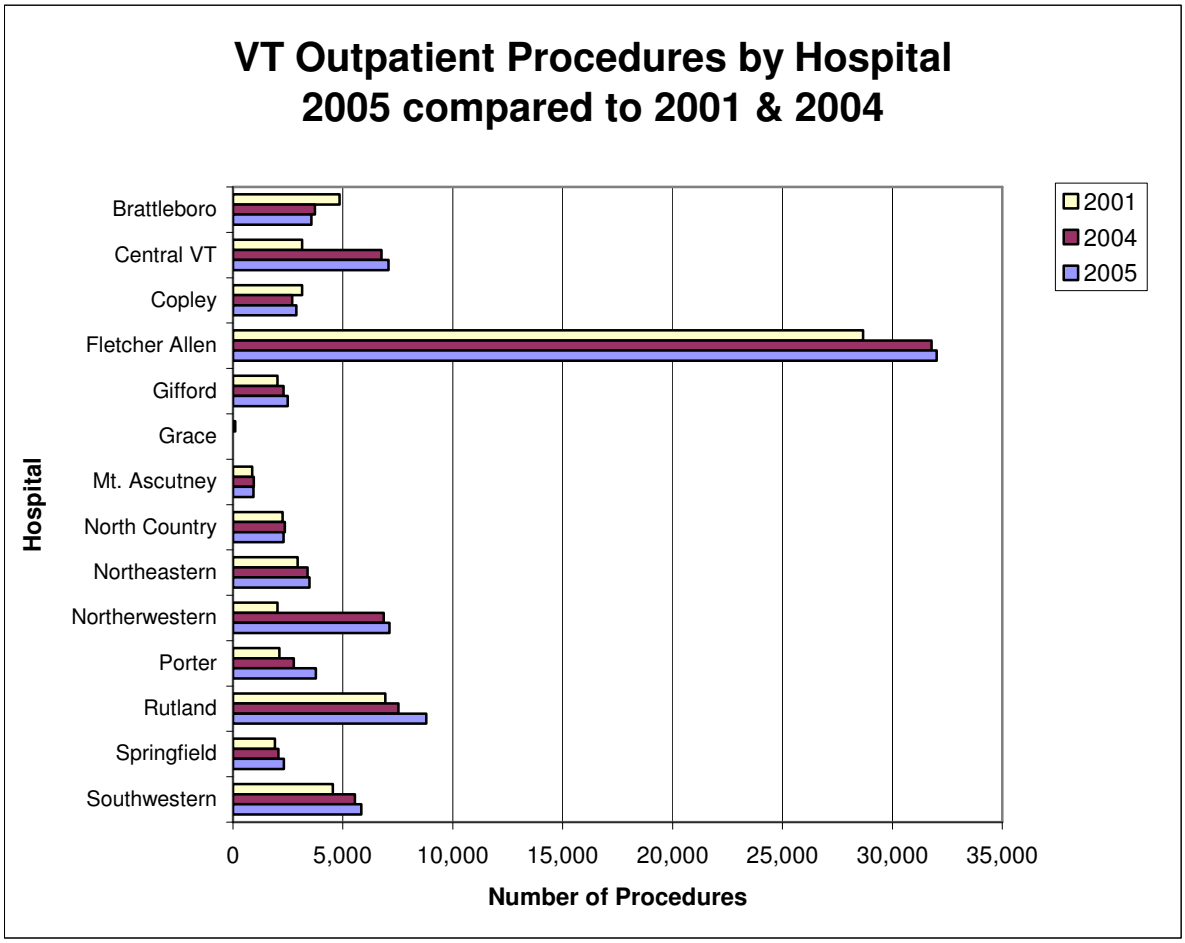


Figure 10

- **Fletcher Allen Health Care continued** to have the highest number of outpatient procedures in 2005 with more than 30,000 procedures, which was roughly 39% of all outpatient procedures across all Vermont civilian acute care hospitals.

Data Source: VT Uniform Hospital Discharge Data Set

Part III: Emergency Department

- **Sources of Data**

  All fourteen of Vermont's civilian acute care hospitals now submit ED data to the hospital discharge reporting system. ED data for Vermont residents who had ED visits in New Hampshire began in 2001 and are received from the New Hampshire Department of Health and Human Services. ED data are not available from Massachusetts, New York, and the Veterans Administration Hospital in White River Junction.

- **Recent Changes in Definition of Emergency Department Visits**

  ED records were previously identified as records coded by hospitals as patient type "E" (ED visit) plus inpatient records whose admission source was coded as "Emergency Room". In 2003 changes were made to the selection criteria for inclusion in ED data analyses. Many discharges originating in the ED are routed elsewhere in the hospital and are coded as other applicable patient types including inpatient, ambulatory surgery, observation bed or series patient. As a result, the selection criteria were expanded to include all patient type records that include a revenue code beginning with 45 (specifically designated for Emergency Room) to accurately capture the entire universe of ED visits. While inpatient stays that originated in the ED are not always included in analyses of ED visits, these are retained as part of the overall inpatient dataset.

- **Comparison to Previous Monographs**

  The Emergency Department data presented in the 2005 monograph are not completely comparable to the data published in the 2002 and earlier monographs and companions. While the number of ED records did not change greatly, the change in record selection criteria affected the type of records included in the Emergency Department category starting with the 2003 discharge data set.

- **In 2004 there was a total of 239,917 Emergency Department visits** from Vermont hospitals (not including the VA hospital) that included both Vermont residents and non-residents. 90% (216,629) of these ED visits were not admitted while the remaining 10% (23,342) of ED visits were admitted and categorized as inpatient discharges.

- **Of the 216,629 ED visits that did not result in an inpatient admission**, 193,772 (89%) were Vermont residents while the remaining 22,857 or 11% were non-residents.

- **New Hampshire reported 21,547 Vermont resident** ED visits in New Hampshire hospitals while Massachusetts reported 2,113 Vermont resident ED visits.* New York does not currently provide data on ED visits for Vermont residents.

*2005 is the first year Massachusetts hospitals reported Vermont residents ED visits.

Patient Characteristics: Variations by Age and Sex

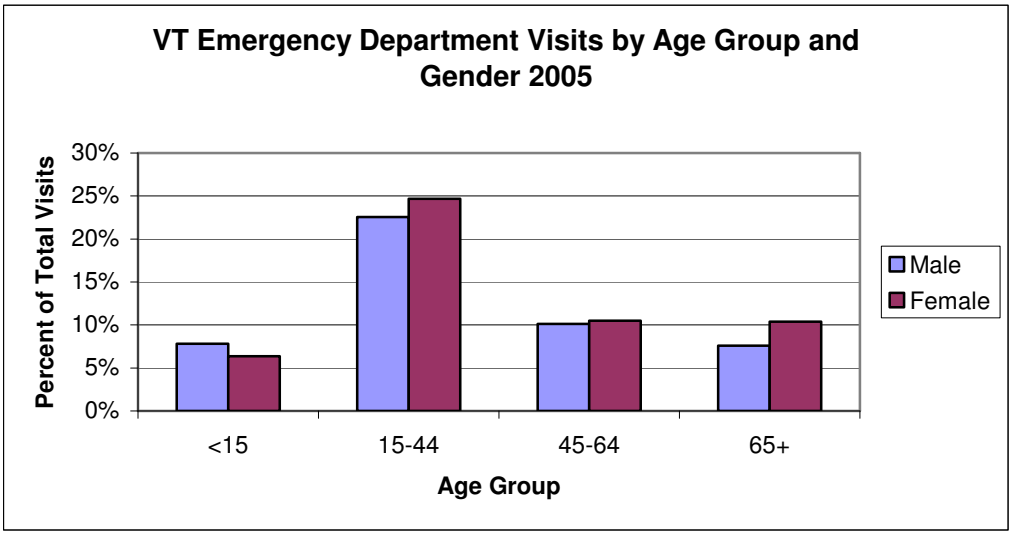


Figure 11

- **The 15-44 age group had** the greatest share (47.2% of the total) of Emergency Department visits in 2005.

- **Females had a higher rate of** Emergency Department visits than males in all age groups except for the < 15 age group

Data Source: VT Uniform Hospital Discharge Data Set

Reasons for ED Visit: Top 10 CCS Diagnosis Groups by Type of ED Visit.

CCS (Clinical Classification Software) collapses principal diagnosis (over 12,000) and procedure codes (over 3,500) into meaningful and mutually exclusive categories (260).

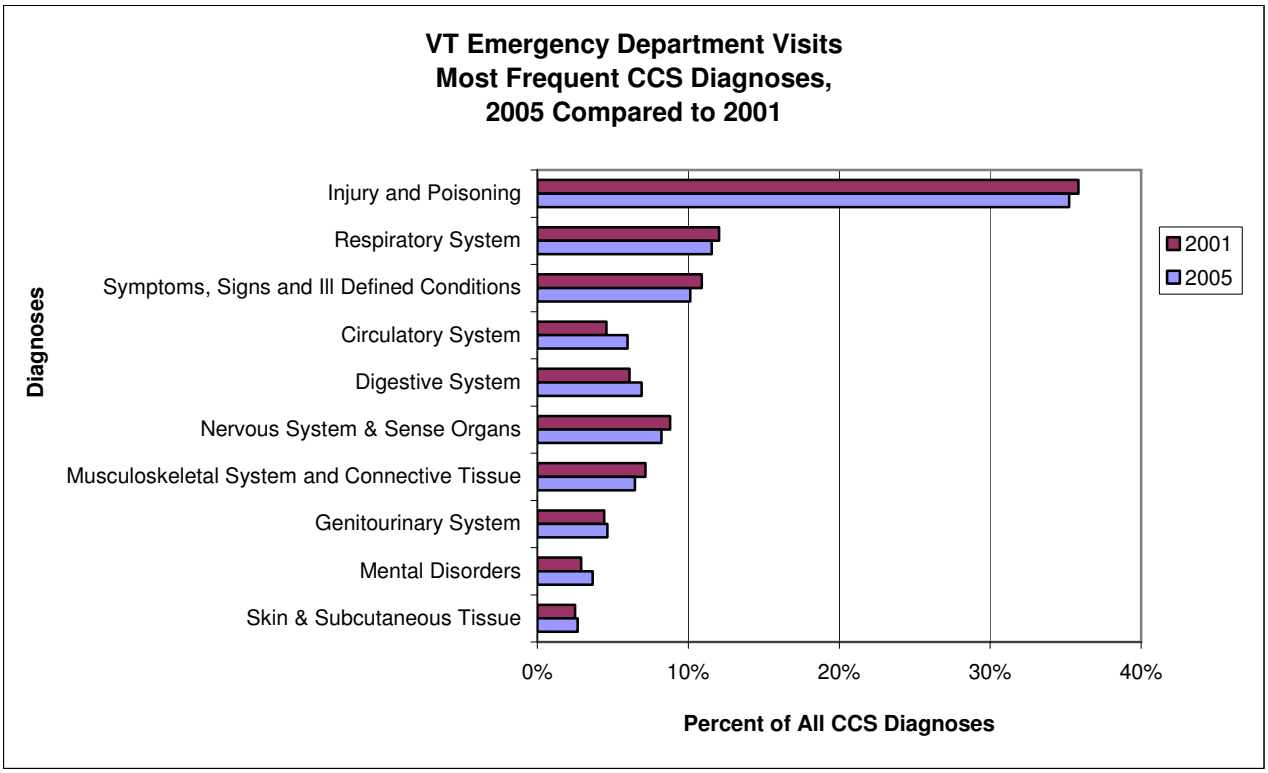


Figure 12

- **Injury and Poisoning accounted** for the most visits in the Emergency Department at about 35%. ED visits for Respiratory and Symptoms, Signs and Ill Defined Conditions were ranked second and third.

Data Source: VT Uniform Hospital Discharge Data Set

VT Emergency Department Visits
Top 3 CCS Diagnosis Groups by Age, 2005

CCS Diagnosis Group	Number	Col%
Age < 5		
Injury and Poisoning	4,251	29.5
Respiratory System	3,439	23.8
Nervous System and Sense Organs	2,055	14.2
Other	4,688	32.5
All Cases	14,433	100.0

CCS Diagnosis Group	Number	Col%
Age 5-14		
Injury and Poisoning	10,707	54.7
Respiratory System	2,439	12.5
Symptoms, Signs and Ill Defined Conditions	1,750	8.9
Other	4,674	23.7
All Cases	19,570	100.0

CCS Diagnosis Group	Number	Col%
Age 15-24		
Injury and Poisoning	18,816	41.3
Respiratory System	4,678	10.3
Symptoms, Signs and Ill Defined Conditions	4,327	9.5
Other	17,760	39.0
All Cases	45,581	100.0

CCS Diagnosis Group	Number	Col%
Age 25-44		
Injury and Poisoning	22,702	33.5
Respiratory System	6,314	9.3
Digestive System	6,299	9.3
Other	32,387	47.8
All Cases	67,693	100.0

CCS Diagnosis Group	Number	Col%
Age 45-64		
Injury and Poisoning	14,356	29.0
Circulatory System	5,851	11.8
Respiratory System	5,374	10.9
Other	23,875	48.3
All Cases	49,456	100.0

CCS Diagnosis Group	Number	Col%
Age 65-74		
Injury and Poisoning	3,375	21.1
Circulatory System	2,964	18.5
Respiratory System	2,461	15.4
Other	7,224	45.1
All Cases	16,024	100.0

CCS Diagnosis Group	Number	Col%
Age 75+		
Injury and Poisoning	5,574	20.5
Circulatory System	5,414	19.9
Respiratory System	4,214	15.5
Other	11,957	44.0
All Cases	27,159	100.0

Data Source: VT Uniform Hospital Discharge Data Set

Hospital Trends: Emergency Department Visits by Hospital

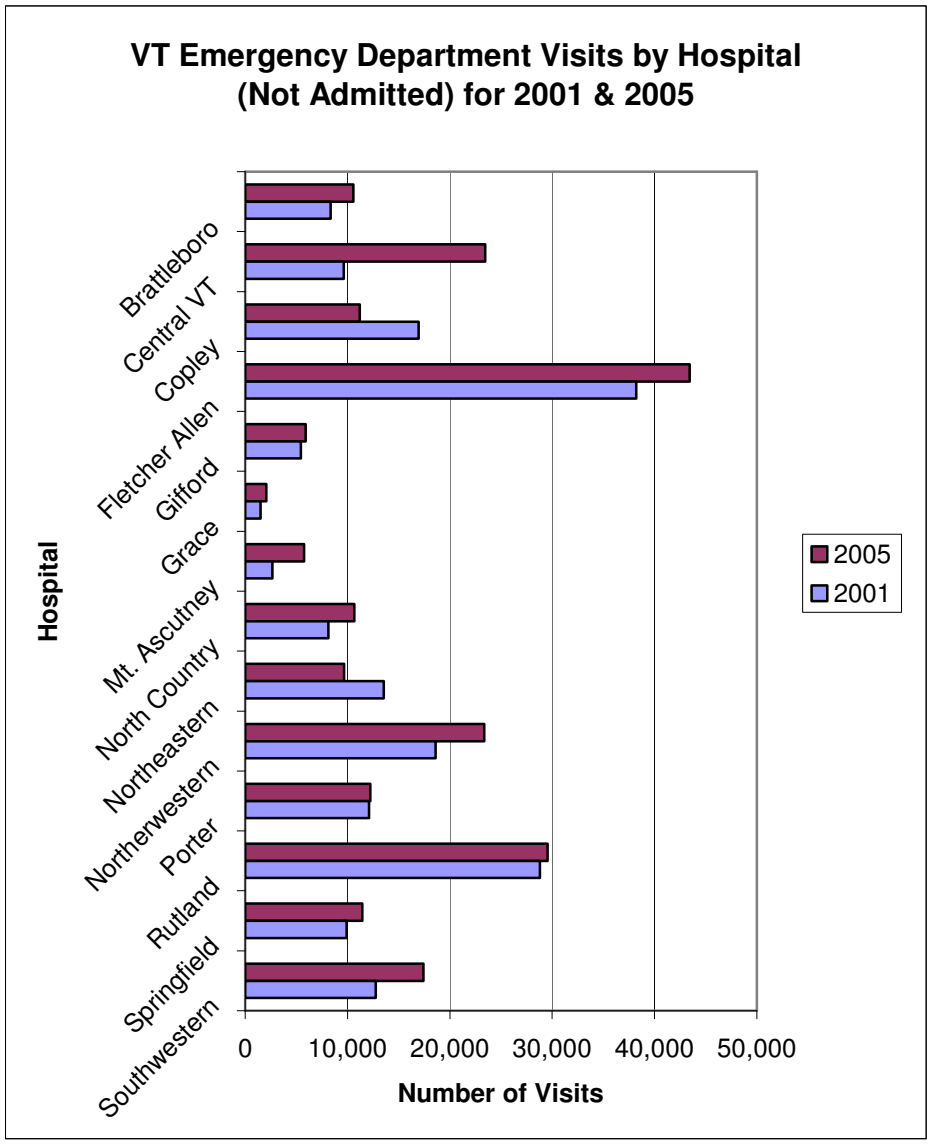


Figure 13

- **Fletcher Allen had the most visits** to the Emergency Department in 2005 with roughly 43,000 visits.

- **Central Vermont has seen a continual increase of visits** to their Emergency Department and ranked third with nearly 23,500 visits in 2005. The top diagnosis for Emergency Department visits at Central Vermont in 2005 was in the category of Injury and Poisoning with almost 8,000 visits.

Data Source: VT Uniform Hospital Discharge Data Set

Hospital Trends: Emergency Department Visits by Day of the Week

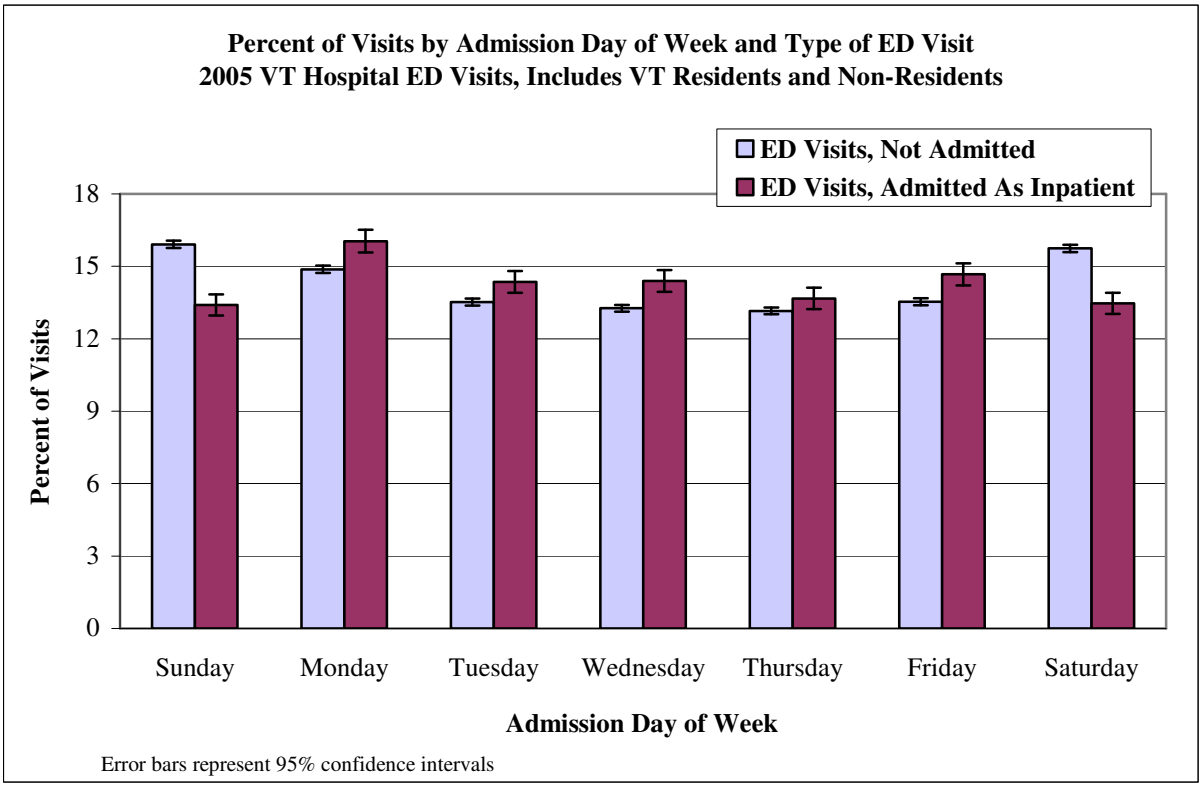


Figure 14

- **The weekend (Saturday and Sunday)** had the highest percent of total Emergency Department visits and a lower rate of admissions to inpatient than the other weekdays.
- **Monday had the highest percent of** Emergency Department visits that became inpatient admissions.

Data Source: VT Uniform Hospital Discharge Data Set

Hospital Trends: Emergency Department Visits by Hour

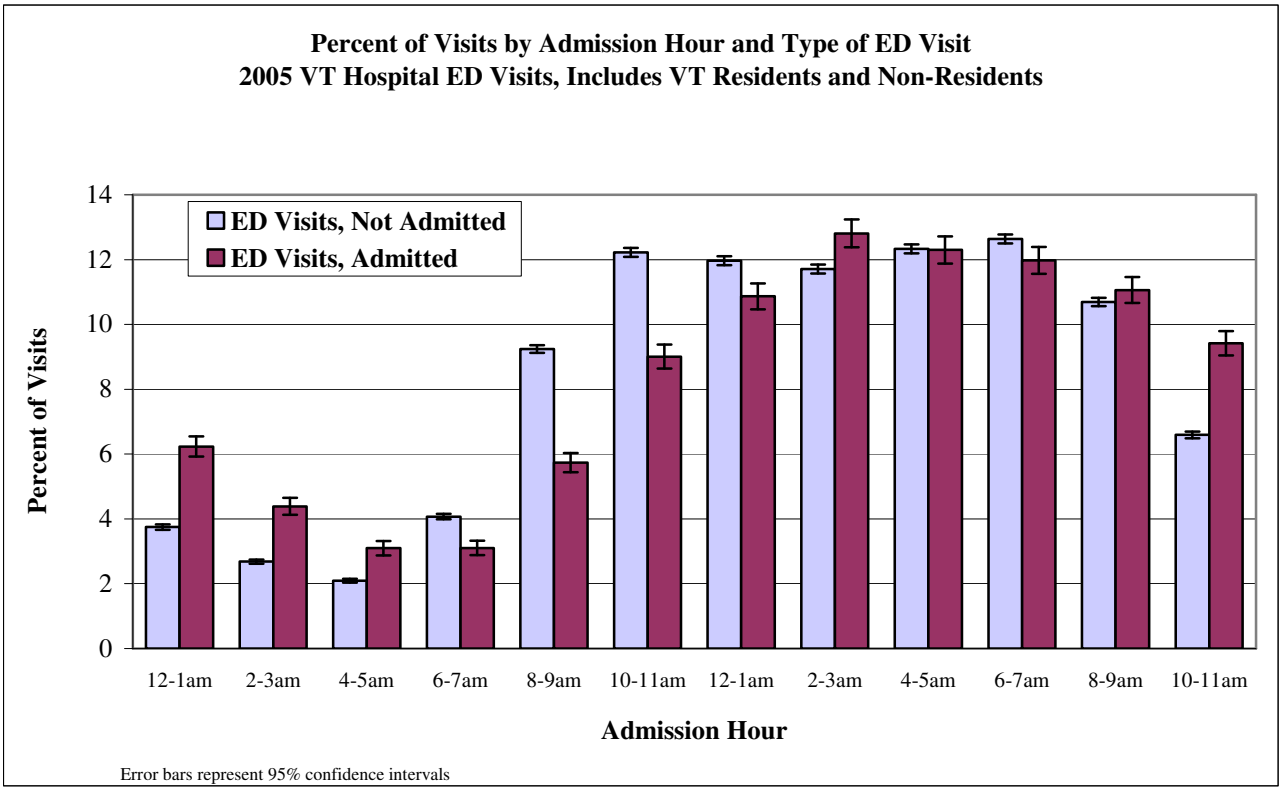


Figure 15

- **Although the rate of Emergency Department (ED) visits declined between 10 p.m. and 8 a.m**. the proportion of those admitted as an inpatient exceeds the proportion not admitted to the hospital between 10 p.m. and 5 a.m. This may be indicative of relatively higher acuity or of other factors making it more difficult to release patients during this overnight time period.
- **The highest overall percentage of Emergency Department visits not resulting** in hospital admissions occurs between 4 pm and 7 pm.
- **The highest overall percentage of Emergency Department visits resulting** in hospital admissions occurs between 2 pm and 9 pm.

Data Source: VT Uniform Hospital Discharge Data Set

Hospital Service Areas

What are Hospital Service Areas (HSAs)?

A Hospital Service Area (HSA) is a geographically distinct population (a group of towns) with a high level of dependence on a specific hospital or group of hospitals. The concept of an HSA is useful to a hospital because it identifies the principal consumers of the hospital's services. The size and shape of the hospital's service area shows the hospital's market penetration and the competitive environment in which it operates.

The HSA definitions used in the Monographs have been modified three times over the last decade. The current methodology relies on identification of discharges for immediate care to define inpatient services for purposes of HSA assignment. A plurality rule is applied that ultimately assigns these discharges to mutually exclusive HSAs and has eliminated "contested" areas for discharges that could not be assigned to single HSAs.

It is important to keep in mind two caveats about interpreting data based on hospital service areas (HSAs). First, from the perspective of people needing hospital services, the residents of an HSA, obtain a significant amount of their care from the hospital(s) in their HSA. But they may also receive a substantial quantity of care from other hospitals outside their HSA.

Second, regarding hospital services, much of the care that a hospital provides is to residents of its service area. However, a hospital may also provide care to Vermonters who live outside its HSA including non-Vermonters. This is particularly true if the hospital is a regional referral center or is located near a border. For more information about HSAs please refer to pages 9-15 and pages 449 - 453 in the Vermont Hospital Monograph Series which can be found on line at:

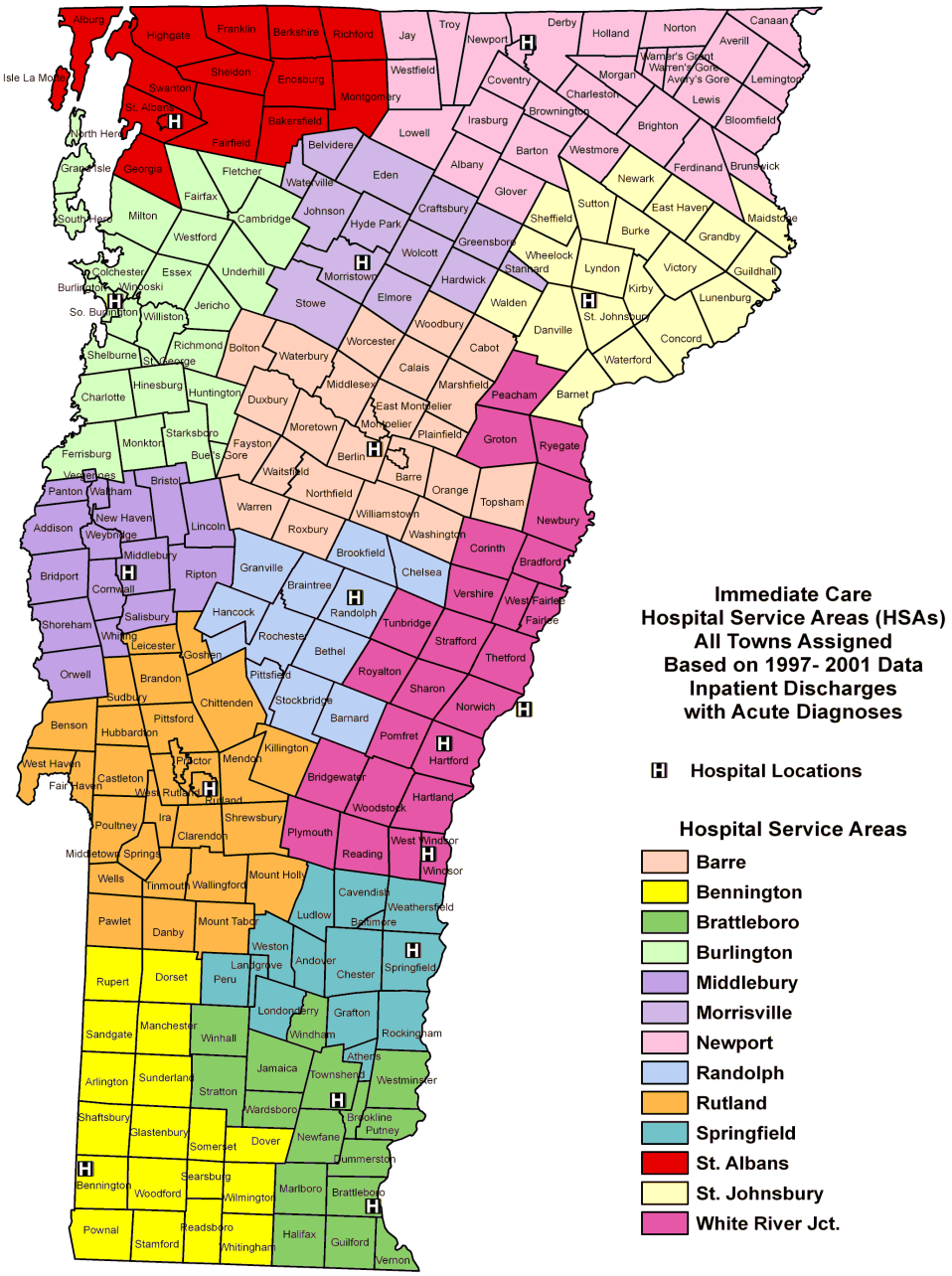
http://www.bishca.state.vt.us/HcaDiv/Data_Reports/hospdata/hospital_monograph_series/index_hospital_monograph.htm

Hospital Service Area Map

This map presents the fourth version of HSAs, using only hospital discharges with the selected acute primary diagnoses requiring immediate hospitalization described above and using a plurality rule so that there are no contested towns.

Map 3 Version 4 of Vermont's Hospital Service Areas
Based on 1997-2001 Immediate Care Records with Acute Diagnoses

Map 3: HSAs (Version 4)



Appendix A: Glossary of Terms

Age Adjustment – Takes into account underlying differences in age distributions between two or more populations or one population at two or more points in time. Age-adjusted rates are computed by applying age-specific rates in a population of interest to a standardized age distribution, in order to eliminate differences in observed rates that result from age differences in population composition. Age adjustment is used in this report for some comparisons between Vermont and the United States.

Average Length of Stay - Total patient days divided by the number of discharges in a selected category. It is a measure of the amount of care provided during a typical hospital stay.

Charges – The amount that the hospital billed for its services, not the amount of payment that the hospital received. Payments are frequently less than charges as a result of contractual arrangements with payers.

Discharge – An individual inpatient hospitalization. Discharge dates, rather than admission dates, are used to indicate when a case is reported. A count of discharges measures how often care is sought. The same individual will be counted as more than one discharge if hospitalized more than once during the time studied. In order to avoid counting hospitalizations for delivery twice, maternal records are included in the dataset and newborn records (defined as MDC = 15 for Vermont) are excluded. This is standard practice in hospital utilization analysis.

Diagnostic Related Groups – Classification of discharges into approximately 540 categories based on age, sex, diagnoses, procedures and outcome. Each category consists of conditions that are medically similar and require similar levels of care. DRGs are identified as either medical or surgical. Under a prospective payment system, Medicare pays hospitals a set fee for treating a patient based on DRG category, regardless of the actual cost of care for the individual.

Inpatient Dataset – Consists of discharge records that were billed as inpatient stays. Newborn records (defined as MDC = 15 for Vermont) are excluded from analyses in this report while maternal records are included to avoid duplicate counts in the tables/graphs. Both newborn and maternal records are retained in the Vermont dataset.

Major Diagnostic Category (MDC) – The aggregation of Diagnostic Related Groups (DRGs) into 25 groups that define major body systems.

National Hospital Discharge Survey (NHDS) – An annual survey conducted by the National Center for Health Statistics that includes data on the characteristics of patients' discharges from non-Federal short stay hospitals. The NHDS includes inpatient records from a national probability sample of hospitals. For more information, visit www.cdc.gov/nchs/about/hdasd/listpubs.htm.

Patient Day – A stay in a hospital for all or part of a day. Patient days are one way of measuring the amount of care provided.

Population – Population data are derived from the 1990 and 2000 U.S. Censuses, from U.S. population Census estimates for July 1 of each intercensal year, from estimates of Vermont's population produced by the Center for Rural Studies at the University of Vermont for the 1991-1999 intercensal years,

and from 2001-2002 estimates of Vermont's population prepared for VDH by Claritas, Inc. Population estimates published in the 1990-1999 *Monograph* series may vary slightly from population data published in this report due to revised estimates that resulted from the 2000 Census.

Principal Payer – The anticipated principal source of payment of the patient's hospital bill.

Rate – Count divided by the population. In order to remove the effect of different population sizes, rates are used instead of counts. The numerator is the number of events in question and the denominator is the number of people at risk for being in the numerator. To make rates easier to understand, they are usually expressed as the number of events per some large number of people, typically 1,000, 10,000 or 100,000 people.

Statistical Significance – Because some of the fluctuation in hospitalization rates is due to chance, trends and comparisons in this report were tested for statistical significance. A 95 percent confidence interval was calculated for each rate, so that the interval has a 95 percent chance of containing the "true" rate, or a rate unaffected by chance events. When confidence intervals for two rates overlap, the difference between the two rates is said to be not statistically significant. Confidence intervals for Vermont rates were calculated with a simple symmetric method. Confidence intervals for the national dataset, the National Hospital Discharge Survey (NHDS), were calculated from published parameters generated by the National Center for Health Statistics using first-order Taylor series approximation of the deviation of estimates from their expected values. Confidence intervals for NHDS rates take into account the sampling variability that occurs because a sample, not the entire universe, is surveyed.

Appendix B: Vermont Hospital Discharge Data Elements

Attribute	Description	Public Use Data Element	Inpatient Dataset
Admission Date		N	Y
Admission Hour		N	Y
Admission Source	Transfer, referral, newborn and court/law enforcement categories	Y	Y
Admission Type	Emergency, urgent, elective, newborn	Y	Y
Age	Single-year age at discharge	N	Y
Age Groups	Under 1, 1-17, 18-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59, 60-64, 65-69, 70-74, 75 and over	Y	Y
Attending physician	Hospital-specific code for attending physician at time of discharge	N	Y
Clinical Classifications Software (CCS) Single Level Diagnosis Groups	Principal diagnosis collapsed into 262 categories. See description in Appendix A.	Y 2001-	Y
Clinical Classifications Software (CCS) High Level Diagnosis Groups	CCS single level diagnosis groups collapsed into 18 high level categories. See description in Appendix A.	Y 2001-	Y
Clinical Classifications Software (CCS) Single Level Procedure Groups	Principal procedure collapsed into 231 categories. See description in Appendix A.	Y 2001-	Y
Clinical Classifications Software (CCS) High Level Procedure Groups	CCS single level procedure groups collapsed into 16 high level categories. See description in Appendix A.	Y 2001-	Y
Date of Birth		N	Y
Diagnosis Related Group (DRG)	Medicare classification system that groups inpatient discharges into approximately 540 categories based on diagnosis, type of treatment, age and other relevant criteria. See listing in Appendix C.	Y	Y
Discharge Date		N	Y
Discharge Status	Categories indicating destination and type of services required at time of discharge, left against medical advice, or death	Y	Y
Ecode	Code for external causes of injury and poisoning; primary Ecode appears in this field, secondary Ecodes may be entered as secondary diagnoses	Y	Y
Grouper	Grouper version used to assign DRG and MDC	Y	Y
Hospital		Y	Y

Hospital Service Area	A grouping of Vermont ZipTowns based on each ZipTown's use of hospital resources. See description on pages 30-32.	Y	Y
Major Diagnostic Category (MDC)	An aggregation of DRGs (see definition of DRGs above) into 25 groups that define major body systems.	Y	Y
Other Physician 1 Other Physician 2	Hospital-specific code for physician performing primary procedure (Other Physician 1) and for physician other than Attending Physician and Other Physician 1	N	Y
Patient days	Length of stay; maximum 255 days	Y	Y
Primary Payer	The anticipated principal source of payment for the patient's hospital bill as coded by the hospital.	Y	Y
Principal and Secondary Procedure Dates	Date of procedure.	N	Y
Principal Diagnosis and Up to 19 Secondary Diagnoses	ICD-9-CM diagnosis code.	Y	Y
Principal Procedure and Up to 19 Secondary Procedures	ICD-9-CM procedure code.	Y	Y
Race		N	Y
Readmission indicator	Any patient readmitted to the same hospital within 30 days	N	Y
Same Day Flag	Admission and discharge were on the same day. Not an overnight stay.	Y	Y
Sex		Y	Y
Special Care Unit Days	Number of days spent in a special care unit	Y	Y
Total Charges	Facility charges. See description in Appendix A.	Y	Y
Year of Discharge		Y	Y
ZIP Code	5-digit ZIP code	N	Y
ZIP Code Groups	3-digit ZIP for most of Vermont and all other states; combined 058 and 059 area; 5-digit ZIP for areas with a population over 10,000	Y	Y
ZipTown Code	Groups of towns that share ZIP code(s). See description on pages 30-32.	N	Y

Public use data for resident and non-resident discharges from Vermont hospitals are available by calendar year. To order, contact:

Vermont Department of Health
Public Health Statistics
108 Cherry Street, PO Box 70
Burlington, VT 05402-0070
(802) 863-7300 or (800) 869-2871

Non-public data elements are available for research purposes only. To request non-public data elements, contact:

Division of Health Care Administration
89 Main Street, Drawer 20
Montpelier, VT 05620-3601
(802) 828-2900 or (800) 631-7788