Visits to Alberta Emergency Departments for Chronic Obstructive Pulmonary Disease (COPD):

April 1, 1999 to March 31, 2005

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February 5, 2009

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Acknowledgments

The authors thank Dan Metes MSc for providing extensive data analysis and data examination. The authors greatly appreciate the efforts of Yan Jin and Sylvia Wilson at Alberta Health and Wellness in facilitating access to the data used in this report.

This report was made possible by an operating grant from the Canadian Institutes of Health Research (CIHR) and funding from The Lung Association, Alberta & NWT.

Dr. Rosychuk is supported by the Alberta Heritage Foundation for Medical Research (AHFMR) as a Population Health Investigator. Dr. Rowe is supported by the Government of Canada as a 21st Century Canada Research Chair.

Disclaimer

This study is based in part on data provided by Alberta Health and Wellness. The interpretation and conclusions contained herein are those of the researchers and do not necessarily represent the views of the Government of Alberta. Neither the Government nor Alberta Health and Wellness express any opinion in relation to this study.

Executive Summary

Chronic obstructive pulmonary disease (COPD) is a chronic illness of varying severity characterized by ongoing symptoms of cough, sputum production, and shortness of breath, and resulting in intermittent exacerbations. Some of these exacerbations may be severe enough to precipitate a visit to an emergency department (ED), and many require prolonged treatment in the ED. Hospital admission is a common outcome, and some exacerbations are severe enough to result in complications (e.g., intubation, pneumothorax, or even death).

EDs are an important resource for all communities, where acute care to medically ill and traumatized patients is received on a 24 hour per day basis. EDs also play a special role in providing care for traditionally under-served populations – the poor, the uninsured, certain minority groups, and rural residents – who often have trouble accessing other sources of care. Improving the care delivered in Alberta EDs requires a thorough knowledge of the frequency, nature and cause of illness. This report describes the epidemiology of COPD visits to Alberta EDs made by individuals at least 55 year of age, using administrative data sources.

During the 1999/2000 to 2004/2005 study period, the yearly number of Albertans who visited the ED for any reason grew from 352,817 to 424,877. During the 1999/2000 to 2004/2005 study period, the number of ED visits for COPD also grew from 13,502 to 16,100, accounting for 3.2% to 3.9% of the total visits in these age groups. During the study period, 85,330 ED visits for COPD were made by 38,638 distinct individuals, with an average of 2.2 visits per individual. A majority of individuals (63.8%) had only one visit during the six year period; however, 36.2% of individuals had multiple COPD-related ED visits. More males than females presented for COPD and the special populations of Welfare recipients and Aboriginals had higher ED visit rates for COPD than the other groups. The ED visit rates varied by region, with the highest number seen in the Capital Region (25.4%). The absolute numbers of ED visits for COPD have increased and the presentation rates have remained relatively stable over the study period.

The peak months for COPD ED visits were generally January and March, although December 1999 had an atypically large number of visits. Mondays had slightly higher volumes of ED visits than the other days of the week. Generally, ED visits showed a larger peak in the number of visits registered between 0800 and 1100 with smaller peaks between 1300 and 1500 and between 1800 and 2000. The median length of time spent in the ED was 2 hours 23 minutes. Admitted individuals spent longer in the ED (median 5h 14m) than discharged individuals (median 1h 40m). The large urban areas of Capital Health and Calgary Health Region had ED visits with longer lengths of stay than the other regions.

For individuals discharged from the ED during a one year period, numerous follow-up visits in non-ED settings at different intervals occurred. Of the 7,302 individuals, 6,415 had at least one follow up visit within a year. Of these 6,415 individuals, 2,887 (45.0%) had at least one follow-up visit within 7 days following the ED visit. Fewer of the follow-up visits were primarily for COPD as the time since ED visit increased. Within 7 days of the end of the ED visit, 5,749 follow-up visits were recorded of which 1,187 (20.6%) were COPD-related. Most follow-up visits occurred

in general practitioners' offices.

Summary: COPD is a common presenting problem in Alberta EDs and further study of these trends is required in order to understand the associated factors relating to the variation in presentations. The impressive findings are an overall increase in the number of presentations over the 6–year study period, relatively stable rates of presentation over the study period, and disparities based on age, gender, region, and socio-economic/cultural status. Targeted interventions could be implemented to address specific groups and further reduce the COPD-related visits to Alberta EDs.

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List of Commonly Used Abbreviations

A	Aboriginal socio-economic proxy
ACCS	Ambulatory Care Classification System
ACT	Active treatment hospital, including active treatment clinic and ambulatory care center
CARD	Cardiology, including cardiac surgery
CC	Critical care
CI	Confidence interval
COPD	Chronic obstructive pulmonary disease
DSVR	Directly standardized visit rate
ED	Emergency Department
EMSP	Emergency medicine - specialty
F	Female
FTER	Full Time Emergency Room
GAST	Gastroenterology, including pediatric gastroenterology
GP	General Practice
ICD	The International Classification of Diseases
IDIS	Infectious diseases
INMD	Internal medicine
IQR	Interquartile range
LWBS	Left without being seen
M	Male
mSES	Modified socio-economic proxy
nonA	Individual without treaty status
PED	Pediatrics
pSES	Socio-economic proxy
R	Registrant without subsidy socio-economic proxy
RHA	Regional Health Authority
RSMD	Respiratory Medicine
S	Government sponsored socio-economic proxy
SD	Standard deviation
sRHA	sub-Regional Health Authority
THOR	Thoracic surgery
W	Welfare socio-economic proxy
yrs	Years

1 Introduction

The discipline of Emergency Medicine is an important area of health care delivery within the Canadian health care system. Emergency departments (ED) are an important resource for all communities, by providing care to medically ill and traumatized patients – 7 days a week, 24 hour a day, every day of the year. EDs also play a special role in providing care for traditionally under-served populations – the poor, the uninsured, certain minority groups, and rural residents – who often have trouble accessing other sources of care. With the development of both adult and paediatric Emergency Medicine residency training programs in Canada, the field of emergency medicine has linked its large clinical volume with increased administrative, educational, and research activities.[1] The goal of the discipline is to provide support, expertise, and coordination for the care of all acutely ill and injured patients in Canada.

This report is designed to assist health care planners, users and others with an understanding of the type and severity of chronic obstructive pulmonary disease (COPD) patients seen in Alberta EDs. The report is based on the principles that improving the care delivered in Alberta EDs requires a thorough knowledge of the frequency, nature and cause of illness and injury presentations. This report is a collaborative effort of a multidisciplinary team aiming to describe the epidemiology of ED visits for COPD across the province of Alberta. It is based on data obtained during the 1999/2000 to 2004/2005 fiscal years from the Ambulatory Care Classification System (ACCS).[2] The ED visits are reported from April 1, 1999, through March 31, 2005. Follow-up visits to physicians after ED visits are also described. These follow-up visits are available for up to 365 days after an individual's ED visit.

2 Background on Chronic Obstructive Pulmonary Disease

Chronic obstructive pulmonary disease (COPD) is a chronic illness of varying severity characterized by ongoing symptoms of cough, sputum production, and shortness of breath, and resulting in intermittent exacerbations.[3] The economic cost of COPD is staggering[4] and it is expected that COPD will be the leading cause of death in the year 2010.[5] Some of these exacerbations may be severe enough to precipitate a visit to acute care setting such as physicians' offices, walk-in clinics or EDs; many patients require prolonged treatments in the ED. Hospital admission is a common outcome, and some exacerbations are severe enough to result in complications (e.g., intubation, pneumothorax, or even death).[6]

There are two distinct patient populations which make up the vast majority of patients with COPD. The largest group is comprised of older adults, in whom the disease is of gradual onset, varying severity, and in whom progressive worsening of disease is expected over time. Smoking is the most common causative agent in this population, although occupational exposures, drug

abuse, genetic susceptibility and rarer primary and secondary lung diseases also contribute to some cases of COPD. A smaller, quite different patient population with COPD is seen in the younger age groups. The most common diagnoses include chronic lung disease of childhood (e.g., cystic fibrosis, bronchopulmonary dysplasia (BPD), etc). BPD is almost always related to premature births and the need for intensive care in the neonatal period. As COPD is a chronic disease with frequent exacerbations in many patients, ED presentations of COPD patients are common, and occur throughout the calendar year. These ED visits result in significant health care resource expenditures for diagnostic testing, treatment, and hospitalization.

Presentations of COPD exacerbations are graded based on the presence of dyspnea, sputum production and sputum purulence.[3] A combination of 3 of these features results in a Class I Antonisen grade, 2 features results in a Class II Anthonisen grade, and 1 feature results in a Class III Anthonisen grade.[7] Treatment of COPD exacerbations begins with oxygen, bronchodilators (e.g., salbutamol, atrovent or a combination of these agents), and a search for the cause (e.g., pneumothorax, heart failure, etc). Corticosteroids have been shown to reduce failures,[8] hospitalization and relapses[9] and are now considered a part of evidence-based care. Antibiotics are frequently prescribed for these patients in the ED and at discharge, especially patients with Class I or II Anthonisen exacerbations. Evidence remains lacking in many other areas of ED care for acute COPD, and researchers have mapped out the needs within this population.[10] Despite seemingly evidence-based care, hospital admission is common, and hospital stays may be prolonged for many of these patients.[6]

3 Methods

3.1 Study Period

The study period for ED visits is April 1, 1999, through March 31, 2005. When examining visits to physicians in non-ED settings after ED visits, the study period of the ED visits is November 1, 2003, to October 31, 2004, and the visits to physicians in non-ED settings are available until October 31, 2005.

3.2 Data Description

The ACCS database was developed as a flexible and integrated system for tracking the use of ambulatory care visits within government-funded facilities in Alberta. For example, clinic visits, ED visits, and services delivered within acute care institutions in Alberta are included in this database; however, acute care visits to walk-in clinics, doctor's private offices and private facilities are not required to be reported. In addition, deaths and in-hospital separations are not recorded in this database unless they originated from an Alberta ED.

Although ACCS tracks a variety of outpatient services, the data used in this report include only services defined as emergency or general emergency. All emergency department encounters in this province are entered into computerized abstracts that constitute the majority of records within the ACCS system. Using a uniform protocol, trained and supervised medical records nosologists code each chart using ICD-9-CM diagnostic codes[11] (prior to April 1, 2002) or ICD-10-CA (April 1, 2002 onward) at each ED in the province. As well, sport/recreation activity sub-codes (as appropriate) and ICD-9-CM diagnostic codes are assigned to each chart by the coder in certain regions.

Each ACCS record represents a service characterized by a combination of a personal health number (unique to each Alberta resident), a management information systems (MIS) code used to classify the type of service provided used and the date of visit. Together, these three identifiers make a given record unique within the data system.

Demographic data were obtained by linking the individuals in ACCS to the individuals in an annual Alberta Health Care Insurance Plan (AHCIP) cumulative registry file. The cumulative registry file includes all persons registered under the provincial health insurance plan at any time in a given year (in this case, the 1999/2000 to 2004/2005 fiscal years). This file includes persons who may have been in the province for only part of the year. Visitors to emergency departments who were not registered with the AB health care insurance plan were not included in this report. The demographic information includes: age, sex, health region of residence and socio-economic proxy. This demographic data was also provided for all members of the Alberta population.

In addition to the ED visit information, subsequent visits to physicians in non-ED settings, hereafter called follow-up visits, were obtained by linking the individuals in ACCS to the individuals in the Physician Claims database. The follow-up visits to physicians within 365 days of an individual's ED visit start date were provided. The maximum date for the follow-up visits is October 31, 2005. Up to three diagnosis ICD-9-CM codes were provided for each follow-up visit and these codes were not restricted to the ED visit diagnoses. Table 3.1 provides a list of the data fields and sources used in this report.

The study was approved by the University of Alberta Health Research Ethics Board.

3.2.1 Diagnostic Information for ED Visit

Diagnostic information in ACCS consists of a main ambulatory diagnosis field, and five and nine additional diagnostic fields, for ICD-9-CM and ICD-10-CA codes, respectively. In the complete 1998/1999 ACCS file, a main ambulatory diagnosis was reported 100% of the time. A second diagnosis was reported 29% of the time; the third, fourth fifth and sixth were reported 6%, 1%, 0.4%, 0.1% of the time, respectively. Recent studies using ACCS data indicate that the accuracy

TABLE 3.1: Data fields used in this report.

Variable	Source
Diagnostic Information for ED Visit	ACCS
Disposition Status	ACCS
Date of ED Visit	ACCS
Time of ED Visit	ACCS
Age	AHCIP, ACCS
Sex	AHCIP, ACCS
Health Region of Residence	AHCIP
Socio-economic Proxy	AHCIP
Date of Follow-up Visit	Physician Claims
Diagnostic Information for Follow-up Visit	Physician Claims
Physician Specialty	Physician Claims
Follow-up Facility Type	Physician Claims

of the diagnosis is approximately 97%.[12–14]

3.2.2 Disposition Status

All patients entering an ED are given a disposition according to the manner in which they are separated/released from the ambulatory service facility. Disposition codes are provided in Table 3.2. Service recipient is the terminology used to refer to an individual visiting an ED for medical care. Regional and temporal variation in coding practices for left without being seen (LWBS) require special consideration when identifying persons who are not seen by a physician in an ED. Through discussions with medical coding experts, LWBS cases were defined as persons who either received a disposition code of “9” (LWBS) or a disposition code of “3” (left against medical advice) in addition to an ICD-9-CM code of “V642” (refused surgery or procedure) recorded as the primary diagnosis. The equivalent ICD-10 code was “Z532”.[15]

Discharged and admitted subgroups were created by defining discharged as disposition 1 or 2, and admitted as disposition 4, 5, or 6.

TABLE 3.2: Disposition codes and definitions.

Code	Definition
1	Discharged – visit concluded.
2	Discharged from program of clinic - will not return for further care. (This code refers only to the last visit of a service recipient discharged from a treatment program at which he/she has been seen for repeat services.)
3	Left against medical advice. (Intended care not completed.)
4	Service recipient admitted as an inpatient to Critical Care Unit or OR (Operating Room) in own facility.
5	Service recipient admitted as an inpatient to other area in own facility.
6	Service recipient transferred to another acute care facility (includes psychiatric, rehabilitation, oncology, and pediatric facilities).
7	DAA - Service recipient expired in ambulatory care service.
8	DOA - Service recipient dead on arrival to ambulatory care service.
9	Left without being seen. (Not seen by a professional service provider.)

3.2.3 Date of ED Visit

The start date is the month and day of the year the ED service was started. The end date is the month and day of the year the ED service ended.

3.2.4 Time of ED Visit

For analytical purposes, time of visit was reduced to hour of visit. The number of visits for a given hour represents the number of visits between the start of that hour and the hour following less one minute (for example, 11:00-11:59).

3.2.5 Age

The age is calculated as the age in years based on the birth date in the cumulative registry file and the ED visit date. When the age is not available in the cumulative registry file, the age recorded in ACCS is used. If there is an inconsistency in the reporting of age from both data sources, the cumulative registry file age is used.

Analyses are restricted to individuals 55 years of age or older. Age categories are formed by grouping ages into 5-year intervals (55–59,...,75–79) with the exception of people 80 years old and older which are all grouped into one category (labeled 80+). Individuals aged 65 years or older are also referred to as seniors.

3.2.6 Sex

The sex is reported in the cumulative registry file. Almost all Albertans are coded as having either a male (M) or female (F) sex. When the sex is not available in the cumulative registry file, the sex reported in ACCS is used.

3.2.7 Health Region of Residence

The health region of residence is reported according to which Regional Health Authority (RHA) the person lived at the end of the fiscal year. In 2005, the province was divided into nine RHAs. These nine RHAs were further divided into 70 sub-Regional Health Authorities (sRHAs). Prior to 2003, the province was divided into 17 regions.[16] Alberta Health and Wellness uses postal code information and the geographic boundaries of the sRHAs to provide the sRHA of residence for each individual in the data file for analysis purposes. Figure 3.1 shows the sRHA boundaries and RHA names. The sRHA codes and names are provided in Appendix E (Table E.1).

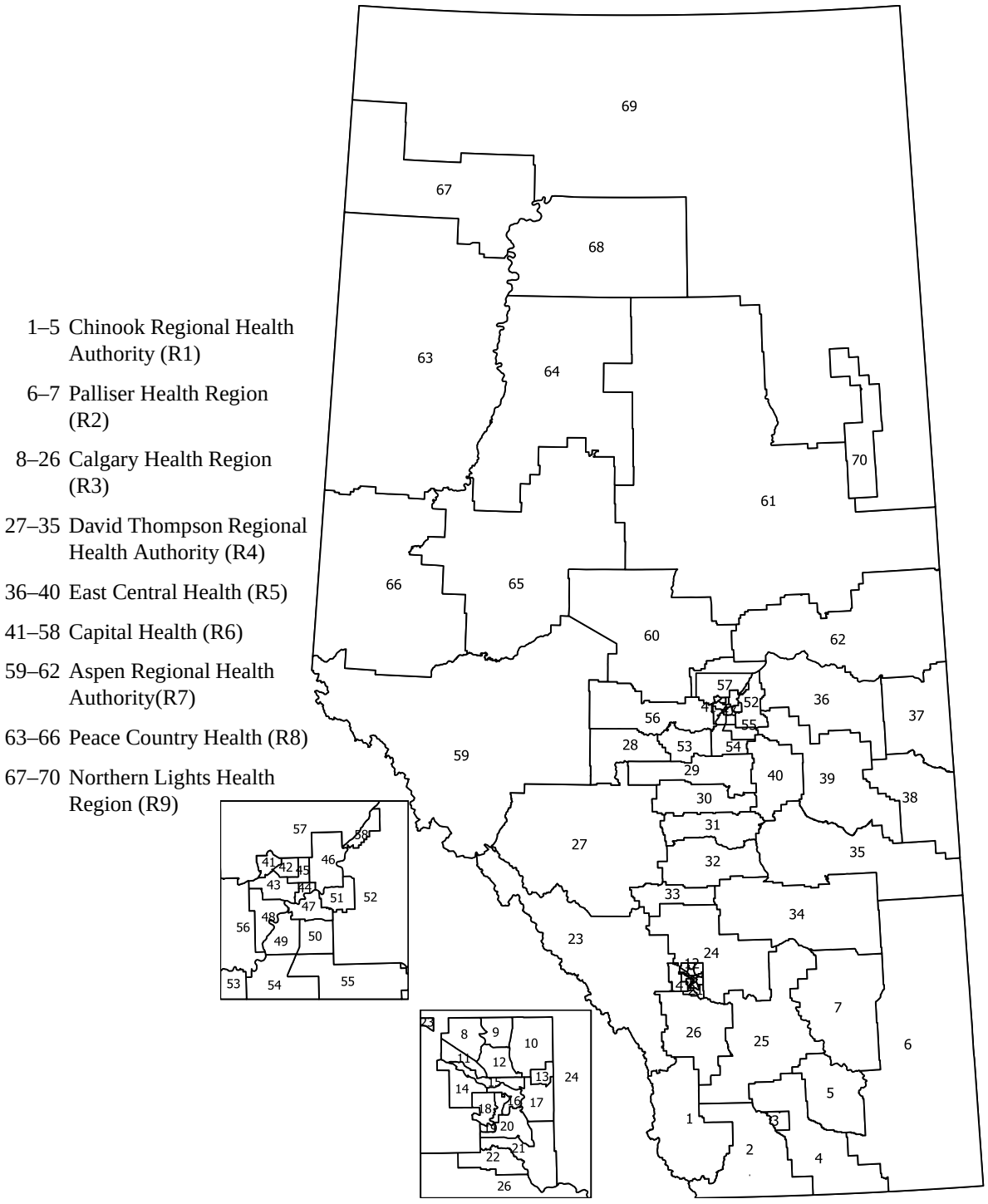
3.2.8 Socio-economic (pSES) and Modified Socio-economic (mSES) Proxies

Until January 1, 2009, healthcare in Alberta was funded by the Alberta government and financed in part through healthcare insurance premiums. Residents with lower incomes or on social services (e.g., welfare) were eligible for subsidies for these health premiums. As a result, the subsidy level can be used as a proxy measure for socio-economic status. In addition, many Aboriginal individuals in Alberta have "Treaty" status based on treaties between their First Nation bands and the Federal Government. These treaties entitle healthcare at no cost for any member of the First Nation band that signed the treaty (for further definition of "Treaty" status, please see reference to Indian and Northern Affairs Canada[17]). Consequently, the subsidy level variable combines data from a number of different fields into a single field with four possible categories: "Aboriginal–with Treaty status" (A), "Welfare" (W), "Government Sponsored Programs" (S), and "Registrant without Subsidy" (R). The Welfare category represents individuals who are receiving income support and health benefits from the province of Alberta because they do not have sufficient resources to meet basic needs (e.g., food, shelter). Albertans with lower incomes who receive partial or full subsidies for their healthcare insurance premiums or those receiving disability benefits comprise the Government Sponsored Programs group.

The four groups are mutually exclusive: each individual is a member of only one group at the end of a fiscal year. This variable is used to determine Alberta residency for the purposes of analyzing data on Alberta residents only. An Alberta resident is defined as an individual that has a non-missing socio-economic proxy (pSES).

The socio-economic proxy must be used carefully when senior citizens (age ≥ 65) are considered.

FIGURE 3.1: Alberta sub-Regional Health Authorities.



Since October 1, 2004, all seniors have been exempt from paying Alberta Health Care Insurance premiums. In addition, the Welfare (assistance program) is not generally applicable to seniors. For individuals 65 years or older, the pSES variable is collapsed to have two possible categories: “Aboriginal–with Treaty status” (A) and “Individual without Treaty status” (nonA). We refer to this new variable as the modified socio-economic proxy (mSES). Data are summarized by pSES for individuals less than 65 years old and by mSES for all ages.

3.2.9 Date of Follow-up Visit

The month, day, and year an individual visited a physician in a non-ED setting is the follow-up visit date. The follow-up visit must occur within 365 days of an individual’s ED visit end date to be included in the data set. The latest date for the follow-up visits is October 31, 2005. To enable 365 day follow-up of individuals making ED visits, a cut-off date of October 31, 2004, for ED visits is used in the follow-up visit analyses.

3.2.10 Diagnostic Information for Follow-up Visit

Diagnostic information in the Physician Claims file consists of three diagnostic fields. These diagnostic fields use ICD-9 codes only.

3.2.11 Physician Specialty

The Physician Claim file provides the specialty of the physician involved in the follow-up visit. For the purposes of this report, 11 physician specialty codes were used (Table 3.3).

TABLE 3.3: Physician specialty codes and definitions.

Code	Definition
CARD	Cardiology, including Cardiac Surgery
EMSP	Emergency Medicine - Specialty
FTER	Full Time Emergency Room
GAST	Gastroenterology, including Pediatric Gastroenterology
GP	General Practice
IDIS	Infectious Diseases
INMD	Internal Medicine
PED	Pediatrics
RSMD	Respiratory Medicine
THOR	Thoracic Surgery
Other	All other categories

3.2.12 Follow-up Facility Type

The follow-up facility type is the type of facility that provided the follow-up service. This information is provided by the Physician Claim file. Three categories of facility are used in this report (Table 3.4).

TABLE 3.4: Facility codes and definitions.

Code	Definition
ACT	Active Treatment Hospital, including Active Treatment Clinic and Ambulatory Care Centre
OFFC	Practitioner's Office
Other	All other categories

3.3 Case Definition

The primary and secondary ambulatory care diagnoses were used to identify cases. These diagnostic fields are reserved for the diagnoses most responsible for the ambulatory service. Distinct individuals were identified using a personal health number (PHN). "First visits" were used for the purposes of generating a numerator in rate calculations. This identification was completed by sorting by PHN and then the date/time of first visit, and retaining only the first record within the grouped sort order. The result is a unique record for each person dated at the first ED visit for COPD. Put simply, a case is any Alberta resident who makes at least one visit to an ED for COPD during the study period.

Two ICD-9-CM and ICD-10-CA codes were used to obtain the case data (Table 3.5). To be considered a COPD visit, the first or second diagnosis fields in ACCS had to have either of the diagnostic codes.

For the follow-up visits, the same diagnostic codes were used to identify COPD follow-up visits and non-COPD follow-up visits. The first or second diagnostic fields had to match at least one of the diagnostic codes in Table 3.5 for the follow-up visit to be classified as a COPD follow-up visit.

3.4 Data Analysis

Frequencies and percentages summarize categorical data such as number of ED visits during the study period. Mean, standard deviation (SD), median, and interquartile range (IQR, 25th percentile to 75th percentile) summarize continuous data such as age at ED visit. Graphical

TABLE 3.5: Diagnostic codes for the case definition of COPD.

Disease Code {**Disease Nomenclature**}	
ICD-9-CM	
490.x	{Bronchitis, not specified as acute or chronic}
491.x	{Chronic bronchitis}
492.x	{Emphysema}
494	{Bronchiectasis}
496	{Chronic airway obstruction, not elsewhere classified}
ICD-10-CM	
J40.x	{Bronchitis, not specified as acute or chronic}
J41.x	{Simple and mucopurulent chronic bronchitis}
J42.x	{Unspecified chronic bronchitis}
J43.x	{Emphysema}
J44.x	{Other chronic obstructive pulmonary disease}
J47.x	{Bronchiectasis}

summaries include bar charts for categorical data and line plots for data over time. The numeric and graphic summaries are provided for each fiscal year and all years combined as well as for different subgroups such as age group, sex, socio-economic proxy (pSES), and modified socio-economic proxy (mSES). For the pSES summaries, only individuals between 55 and 64 years of age are included. To ensure individuals are not identifiable from the data summaries, some small counts are suppressed or categories are combined.

Individuals made multiple visits to the ED. When summarizing ED visit information, the number of visits and the number of individuals are determined. If the summary involves mutually exclusive categories, such as male or female, then the number of distinct (unique) individuals are reported. For information like disposition, the same individual may have multiple ED visits during the study period and each ED visit may have a different disposition. In this case, the number of individuals by category is reported but the individuals are not necessarily distinct.

For each fiscal year, the number of COPD ED visits per 1,000 population (age $\geq$ 55) is calculated by age groups (55–59,...,75–79, 80+) and sex for the full data set. These same calculations are made by pSES group.

Directly standardized visit rates (DSVRs) and associated SDs[18] are calculated adjust for differences in the sex and age distributions over time and over geography. The Alberta population in 1999/2000 stratified by sex and age group is used as the reference population for DSVRs based on the whole group. The DSVRs are calculated by fiscal year and by RHA. The DSVRs have no intrinsic meaning but are a way to compare data to adjust for sex and age distributions. Confi-

dence intervals (CIs) are provided for DSVR estimates and statistical tests are used to compare DSVRs between pSES groups during the same fiscal year.

To facilitate analyses with both the ED and follow-up visits, a subset of ED visits that concluded with a discharge (disposition 1 or 2) and had an ED visit end date before November 1, 2004, is created. If an individual had more than one ED visit that concluded in discharge during this time frame, one ED visit is randomly selected to be the ED visit included in the discharged subset. This discharged subset includes only one record per distinct individual and allows our analyses to focus on follow-up visits after a specific ED visit. In addition, we are able to capture a full 365 days of follow-up visits following an ED visit. The follow-up visits are summarized for the 7, 14, 30, 90, and 365 days following the ED visit by the follow-up visit variables.

The discharged subset is also used to examine the time from the ED visit ("index") to the next ED visit, as well as the time from the ED visit to the first follow-up visit. The time from the index ED visit end date to the next ED visit start date is calculated. If an individual did not have an ED visit after the index ED visit, the time calculated is based on the time from the index ED visit to the end of the study period (March 31, 2005). These individuals' event times are censored at March 31, 2005. Similarly, the time from index ED visit to the first follow-up visit is calculated. If an ED visit had occurred before the first follow-up visit, the time is censored at the date of the ED visit. If an individual did not have a follow-up visit before the end of the study period, the time is censored at the end of the study period (i.e., March 31, 2005). Kaplan-Meier curves are created to display the times to these events by different factors. Log-rank tests are provided to compare pSES groups.

There are several instances where data were missing or inconsistent. The population data included 3,231 individuals with missing age and 97 individuals with missing sRHA of residence. These individuals are reported as missing throughout the age and region related population summary tables; however, are excluded from calculations when directly standardized rates for ED visits are computed.

For the ED visits data, three visits for the same individual have no reported sRHA of residence. The regional summary tables contain this information; however, the regional DVSRs do no include these missing observations. Eight individuals with multiple ED visits had inconsistent ages. Since the data does not contain the exact birthday of individuals, the "correct" ages are not known. For six of the individuals, the ages were in the same age group and thus, the analyses by age group were not affected.

Some ED visit start and end dates are also found to have inconsistencies that indicated overlapping ED visits (e.g., start date of one ED visit listed before the end date of an earlier ED visit). Of 1,137 ED visits (246 distinct individuals) with date overlaps, 592 records were removed and

54 records were modified. Expert opinion was used to inspect these overlapping records and determine distinct visits.

SAS[19] and Splus[20] were the statistical software packages used for data analysis.

4 Results

All results are provided for individuals aged 55 years or older.

4.1 Alberta Population

During the study period, the number of Albertans aged 55 years or older increased from 531,467 in 1999/2000 to 642,205 in 2004/2005 (Table 4.1). The population had slightly more females than males (52.6% females, 47.4%males in 2004/2005) and had more females in the older age groups. Senior citizens (age $\geq$ 65 years) represented just over half of population (52.7% in 2004/2005). For those less than 65 years of age, 76.1%, 17.9%, 4.2%, and 1.9% were part of the Registrant without Subsidy, Government Sponsored Program, Welfare, and Aboriginal groups, respectively, in 2004/2005. Around 1.4% of individuals over 55 years of age were from the Aboriginal group.

In each RHA, the population of 55 and over increased over the study period. The population was almost evenly split among the two urban regions, Calgary Health Region (R3) and Capital Health (R6), and the non-major urban regions. Calgary Health Region (R3) and Capital Health (R6) each had populations of over 209,000 as of March 31, 2005. Northern Lights Health Region (R9) had the smallest population size (6,645 in 2004/2005).

TABLE 4.1: Demographic information for Albertans (age $\geq$ 55 yrs) by fiscal year. Counts and percentages (%) are provided by sex, age group, socio-economic proxy (pSES, age 55–64 yrs), modified socio-economic proxy (mSES, age $\geq$ 55 yrs) and Regional Health Authority (RHA).

	Fiscal Year					
	99/00	**00/01**	**01/02**	**02/03**	**03/04**	**04/05**
n	531,467	548,534	572,529	597,085	618,445	642,205
Sex						
F	281,903 (53.0)	290,675 (53.0)	302,808 (52.9)	315,101 (52.8)	325,906 (52.7)	337,611 (52.6)
M	249,564 (47.0)	257,859 (47.0)	269,721 (47.1)	281,984 (47.2)	292,539 (47.3)	304,594 (47.4)
Age, yrs						
mean (SD)	67.7 (9.5)	67.7 (9.5)	67.6 (9.6)	67.4 (9.7)	67.4 (9.7)	67.3 (9.7)
median	66	66	66	66	66	65
Age Group						
55-59	129,431 (24.4)	135,268 (24.7)	146,978 (25.7)	158,544 (26.6)	167,091 (27.0)	176,968 (27.6)
60-64	102,836 (19.3)	105,722 (19.3)	110,136 (19.2)	115,230 (19.3)	120,634 (19.5)	126,021 (19.6)
65-69	92,178 (17.3)	93,029 (17.0)	93,638 (16.4)	94,903 (15.9)	96,580 (15.6)	98,603 (15.4)
70-74	77,676 (14.6)	80,076 (14.6)	82,248 (14.4)	83,662 (14.0)	84,554 (13.7)	85,401 (13.3)
75-79	59,778 (11.2)	61,320 (11.2)	62,317 (10.9)	64,072 (10.7)	65,960 (10.7)	68,194 (10.6)
80+	68,843 (13.0)	72,448 (13.2)	76,628 (13.4)	80,172 (13.4)	83,221 (13.5)	86,674 (13.5)
Missing	725 (0.1)	671 (0.1)	584 (0.1)	502 (0.1)	405 (0.1)	344 (0.1)
pSES (55–64 yrs)						
A	4,254 (1.8)	4,501 (1.9)	4,856 (1.9)	5,212 (1.9)	5,463 (1.9)	5,778 (1.9)
R	180,365 (77.7)	189,335 (78.6)	206,401 (80.3)	222,589 (81.3)	236,089 (82.1)	230,491 (76.1)
S	37,356 (16.1)	36,628 (15.2)	35,038 (13.6)	34,503 (12.6)	34,072 (11.8)	54,111 (17.9)
W	10,292 (4.4)	10,526 (4.4)	10,819 (4.2)	11,470 (4.2)	12,101 (4.2)	12,609 (4.2)
mSES						
A	6,896 (1.3)	7,367 (1.3)	7,881 (1.4)	8,460 (1.4)	8,948 (1.4)	9,429 (1.5)
nonA	524,571 (98.7)	541,167 (98.7)	564,648 (98.6)	588,625 (98.6)	609,497 (98.6)	632,776 (98.5)
RHA						
R1	32,042 (6.0)	32,673 (6.0)	33,571 (5.9)	34,587 (5.8)	35,320 (5.7)	36,336 (5.7)
R2	19,373 (3.6)	19,829 (3.6)	20,387 (3.6)	20,924 (3.5)	21,499 (3.5)	22,024 (3.4)
R3	172,251 (32.4)	179,108 (32.7)	188,888 (33.0)	199,005 (33.3)	207,819 (33.6)	217,602 (33.9)
R4	53,618 (10.1)	54,960 (10.0)	56,803 (9.9)	59,092 (9.9)	60,956 (9.9)	63,047 (9.8)
R5	26,363 (5.0)	26,777 (4.9)	27,307 (4.8)	27,888 (4.7)	28,048 (4.5)	28,684 (4.5)
R6	173,068 (32.6)	178,766 (32.6)	186,847 (32.6)	194,506 (32.6)	201,652 (32.6)	209,039 (32.6)
R7	30,679 (5.8)	31,405 (5.7)	32,522 (5.7)	33,529 (5.6)	34,374 (5.6)	35,474 (5.5)
R8	19,436 (3.7)	20,047 (3.7)	20,841 (3.6)	21,729 (3.6)	22,510 (3.6)	23,336 (3.6)
R9	4,625 (0.9)	4,958 (0.9)	5,348 (0.9)	5,805 (1.0)	6,246 (1.0)	6,645 (1.0)
Missing	12 (0.0)	11 (0.0)	15 (0.0)	20 (0.0)	21 (0.0)	18 (0.0)

4.2 ED Visits for COPD

4.2.1 General

During the study period, the yearly number of visits to the ED for any reason grew from 352,817 (1999/2000) to 424,877 (2004/2005) for Albertans aged 55 years and older. The COPD-related ED visits increased from 13,602 in 1999/2000 to 16,111 in 2004/2005, accounting for about 3.8% of the total visits per year (Table 4.2). Over all six fiscal years, 85,330 ED visits for COPD were made by 38,638 distinct individuals, with an average of 2.2 visits per individual (median 1, IQR 1 to 2, max 106). Most individuals (24,633, 63.8%) had only one COPD-related visit during the six year period, while 36.2% of individuals had multiple COPD-related visits. For the majority of ED visits (72.0%), the COPD diagnosis was reported as the first diagnosis only.

A person ≥55 years visits an Alberta ED ***every 37 minutes*** *because of COPD.*

TABLE 4.2: ED visits and distinct individuals by diagnosis for each fiscal year and all years.

	99/00	00/01	01/02	02/03	03/04	04/05
All conditions and individuals age 55 and over						
Visits	352,817	369,038	382,183	400,503	422,798	424,877
Individuals	142,344	147,355	152,085	161,024	168,391	174,809
COPD reported as 1st or 2nd diagnosis						
Visits	13,602	13,386	14,116	12,891	15,225	16,110
Individuals	8,750	8,323	8,749	8,448	9,916	10,485
COPD reported as 1st diagnosis only						
Visits	9,490	9,292	9,751	9,528	11,442	11,929
Individuals	6,903	6,579	6,954	6,779	8,167	8,579
COPD reported as 2nd diagnosis only						
Visits	3,981	3,947	4,237	3,196	3,576	3,973
Individuals	2,695	2,581	2,654	2,384	2,560	2,745

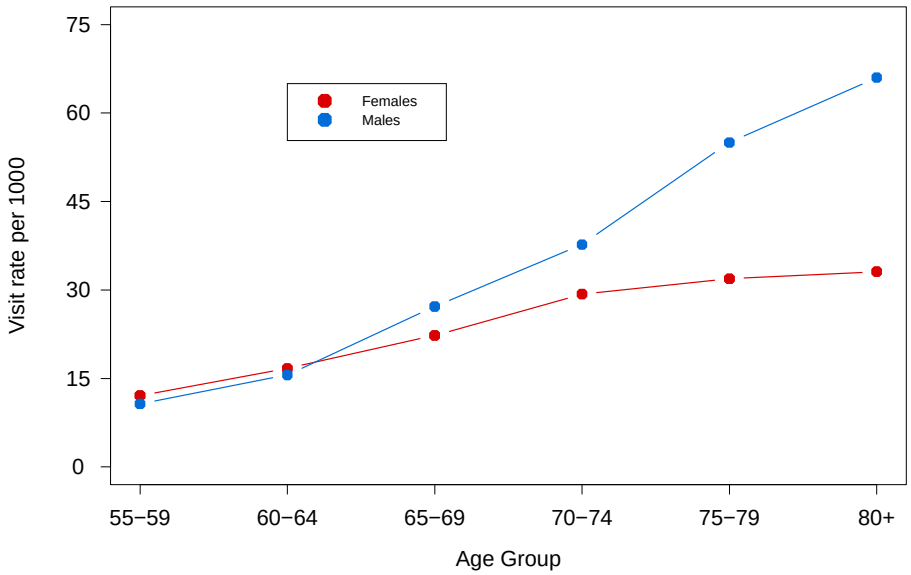
4.2.2 Age and Sex

Of the 85,330 COPD-related ED visits, 75.3% (64,292 visits) were made by seniors (age ≥ 65 years). Male visits exceeded female visits overall, 53.2% vs. 46.8% (45,370 vs. 39,960).

Males ≥80 years were ***≈ 2 times more likely*** *to visit the ED for COPD than females.*

While the COPD ED visit rates in the age groups 55–59 and 60–64 were comparable for males and females, the higher age groups display more pronounced differences between the two sexes (Figure 4.1).The visit rate for males in the 80+ age group was nearly double the rate of females (66.0/1000 for males vs. 33.1/1000 for females in 2004/2005). A similar pattern was observed for the other fiscal years.

FIGURE 4.1: Age group and sex ED COPD visit rates per 1,000 population, 2004/2005.

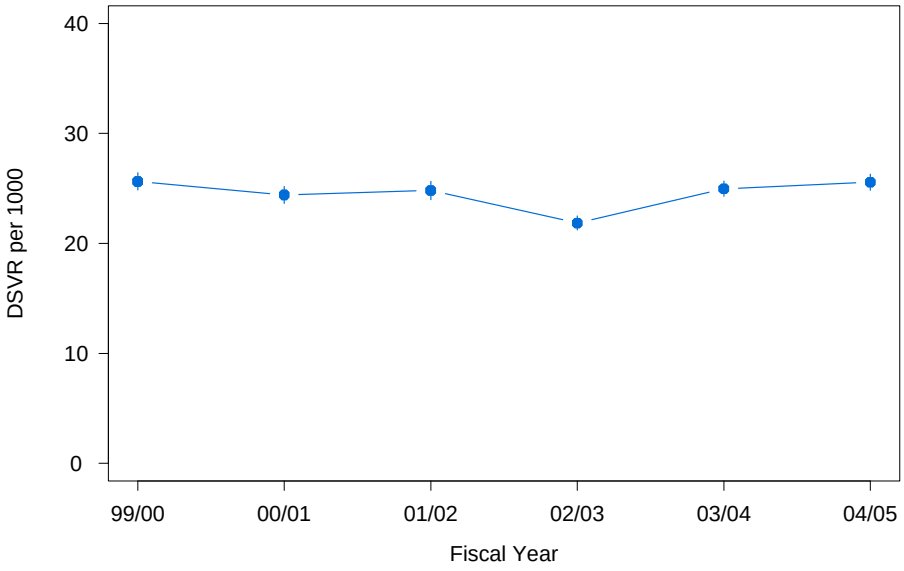


The sex and age group directly standardized visit rates have stayed relatively constant over time, 24.4/1000 in 1999/2000 and 25.6/1000 in 2004/2005 (Figure 4.2). The DVSR for 2002/2003 is slightly smaller than the other years. In 2002/2003, 12,891 ED visits were recorded and this number was the lowest number of ED visits during the study period. While the population size increased year over year during the study period, the relatively small number of ED visits during this year coupled with the larger population size resulted in a relatively smaller DVSR for this year rather than other years.

4.2.3 Special Populations

Individuals 55 to 64 years old are grouped *a priori* into four socio-economic proxy (pSES) categories. In 2004/2005, the majority of COPD ED visits (50.1%, 2025/4044) were made by the Registrant without Subsidy pSES group (Table 4.3). Nearly a quarter of the visits (24.1%) were made by 687 individuals in the Government Sponsored Program group. The Welfare group repre-

FIGURE 4.2: Sex and age group directly standardized visit rates (DSVRs) per 1,000 population and 95% confidence intervals for each fiscal year.



sented 18.1% of the COPD ED visits, while the Aboriginal group had 7.7% of COPD ED visits. In 2004/2005, the Aboriginal and Welfare groups had disproportionately more ED visits than population (Figure 4.3), while the opposite was true for the Registrant without Subsidy group. Similar patterns were seen in each of the other years.

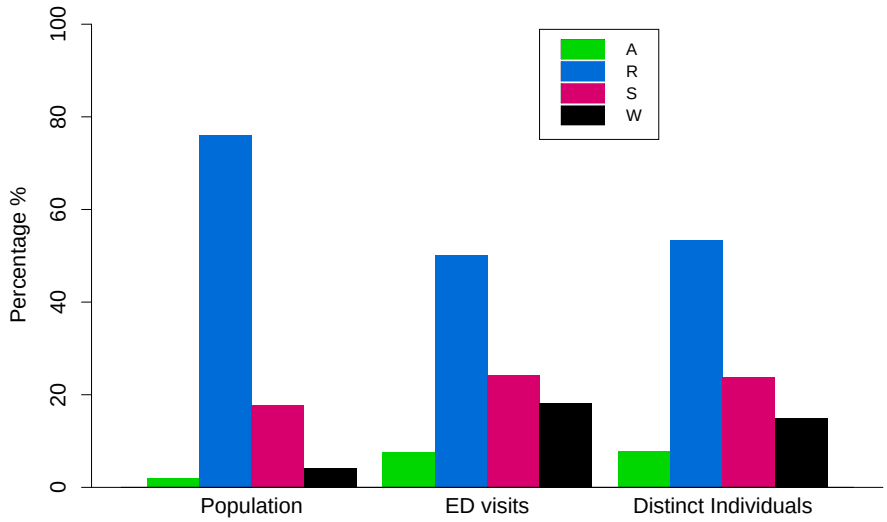
Aboriginal & Welfare groups had ***≈ 4 times more*** *visits than expected based on population.*

TABLE 4.3: ED visits by pSES (age 55–64) for each fiscal year and all years combined.

	99/00	00/01	01/02	02/03	03/04	04/05	All
ED Visits							
n	3,306	3,283	3,458	2,986	3,961	4,044	21,038
A	221 (6.7)	262 (8.0)	333 (9.6)	257 (8.6)	347 (8.8)	311 (7.7)	1,731 (8.2)
R	1,823 (55.1)	1,718 (52.3)	1,852 (53.6)	1,669 (55.9)	2,211 (55.8)	2,025 (50.1)	11,298 (53.7)
S	804 (24.3)	745 (22.7)	646 (18.7)	535 (17.9)	648 (16.4)	975 (24.1)	4,353 (20.7)
W	458 (13.9)	558 (17.0)	627 (18.1)	525 (17.6)	755 (19.1)	733 (18.1)	3,656 (17.4)

The visit rates per 1,000 population for the different pSES groups varied markedly (Figure 4.4). The Registrant without Subsidy and Government Sponsored groups had substantially lower visit rates than the other two groups. The Registrant without Subsidy group had basically the same visit rate for each sex and age group. In 2004/2005, the rates were 9.9/1000 for females and 10.0/1000 for males for the Registrant without Subsidy group. The older age group had higher

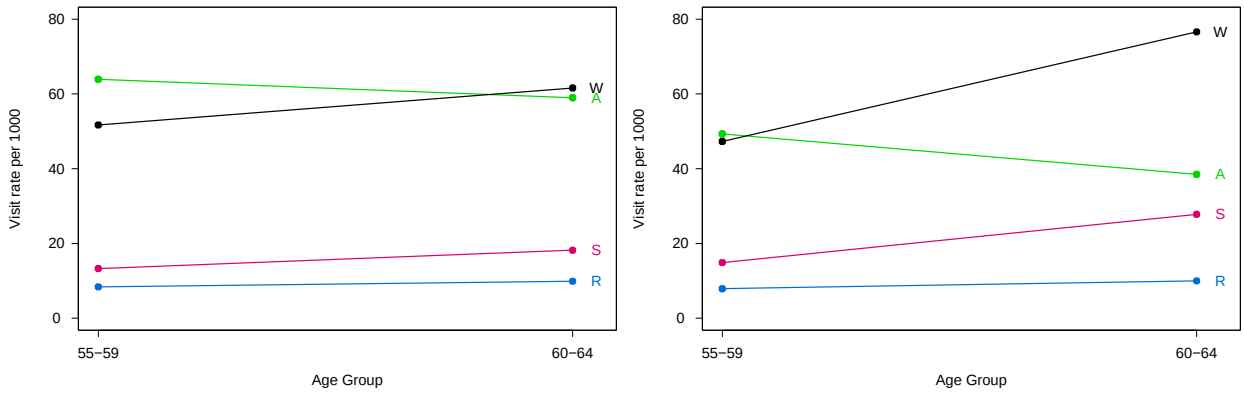
FIGURE 4.3: Population, ED visits, and distinct individuals by pSES (age 55–64 yrs), 2004/2005.



visit rates for males and females in the Welfare and Government Sponsored groups than the younger age group (older age group: 61.6/1000 for females and 76.6/1000 for males in the Welfare group and 18.2/1000 for females and 27.8/1000 for males in the Government Sponsored group). Conversely for the Aboriginal group, the younger age group had larger rates (63.9/1000 for females and 49.3/1000 males) than the older age group (59.0/1000 for females and 38.5/1000 for males).

FIGURE 4.4: Age-specific ED COPD visit rates per 1,000 population by pSES, 2004/2005.

(a) Females (b) Males

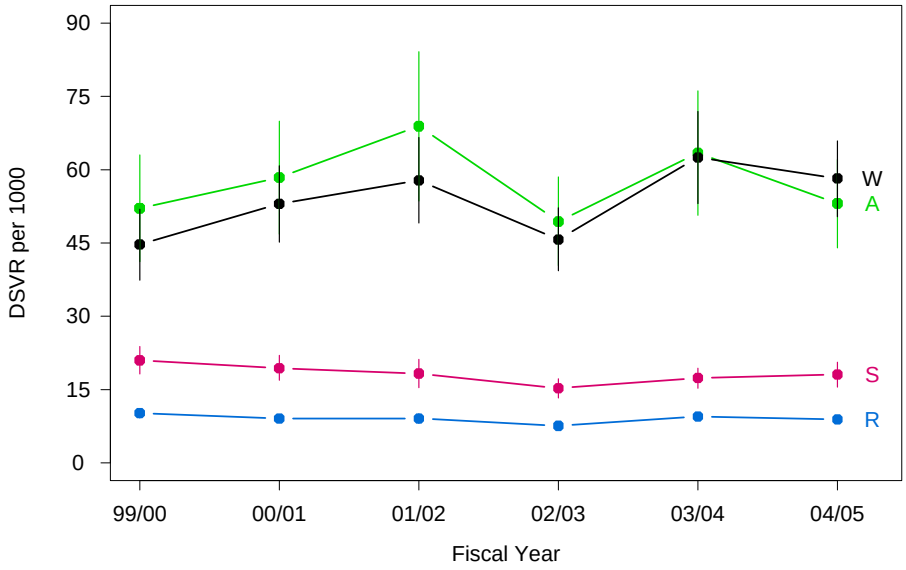


The directly standardized visit rates also differed considerably (Figure 4.5) by pSES group for

Aboriginal & Welfare groups had ***over 3 times higher*** *adjusted visit rates than the other groups in 2004/05.*

each year ($p < 0.001$ in each year) . The DVSRs for the Government Sponsored group were similar over time: 21.0/1000 in 1999/2000 and 18.1/1000 in 2004/2005. The Registrant without Subsidy group had rates of 10.2/1000 in 1999/2000 and 8.9/1000 in 2004/2005. Individuals from the Aboriginal and Welfare groups had the largest DVSRs. The Aboriginal group rates were 52.1/1000 in 1999/2000 and 53.1/1000 in 2004/2005. Similarly, the Welfare group rates were 44.7/1000 in 58.2/1000 in the same years. No evidence of a statistically significant difference was found for these two groups ($p > 0.2$ in each year).

FIGURE 4.5: Sex and age group directly standardized visit rates (DSVRs) per 1,000 population by pSES (age 55-64 yrs) and 95% confidence intervals for each fiscal year.

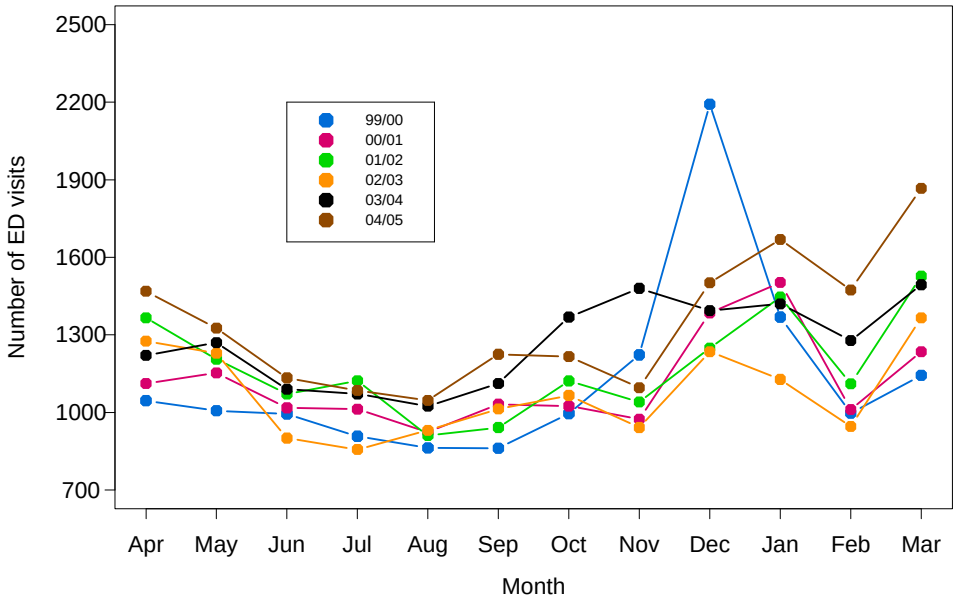


4.3 Visit Timing

Time of visit was based on the start date and time of the ED encounter. COPD ED visits show some variation throughout each year, recording a minimum of 857 ED visits in July 2002 and a maximum of 2,192 ED visits in December 1999. During the 2004/2005 fiscal year, the month with the lowest number of ED visits recorded was August 2004 (1,047 visits) while the highest number of ED visits occurred in March 2005 (1,867 visits). Over the study design period, the summer months tended to have fewer visits, while January and March showed more definite peaks (Figure 4.6).

Although the volume of ED visits was quite stable over the days of the week, a somewhat higher number of ED visits occurred on Mondays, while lower numbers occurred in the middle of the week (Wednesdays and Thursdays). In 2004/2005, 2,506 (15.6%) ED visits were recorded on

FIGURE 4.6: ED visits by month for each fiscal year.



Mondays and 2,201 (13.7%) on Wednesdays. Generally, the number of visits by day of week increased every year (Figure 4.7).

The hour of the day was missing for 7,167 (8.4%) of the 85,330 ED visits. The number of missing ED visit start times decreased over time so that all ED visits during 2004/2005 had the start time recorded. COPD visits were less frequent during the early morning hours. In 2004/2005, 1,406 ED visits (i.e., 8.7% of all visits) occurred during midnight to 0700. Generally, ED visits showed a significant peak period during 0800 to 1100, followed by a gradual decrease in the number of visits (Figure 4.8). Two smaller peaks can be seen between 1300 to 1500 and 1800 to 2000. When specific regions are considered, Capital Health and Calgary Health Region did not have as pronounced peak periods as all other regions combined (Figure 4.9).

Duration in the ED differed by disposition and region.

Of the 85,330 COPD ED visits 7,441 (8.7%) had either the start time and/or the end date/time recorded as missing. Also, 137 records had identical start/end dates and times and most of them had a disposition of discharged (67 visits) or admitted as an inpatient to other area in own facility (45 visits). Conversely, six ED visits reportedly exceeded 7 days and half of them took place in the Capital Region (R6). Of the remaining 77,746 ED visits, the median time was 2h 23m (IQR 1h 0m to 6h 5m). Discharged individuals had a median ED visit time of 1h 40m (IQR 0h 48m to 4h 10m, 53,111 visits), whereas admitted individuals had a median ED visit time of 5h 14m (IQR 2h 1m to 10h 33m, 24,430 visits).

FIGURE 4.7: ED visits by day of week for each fiscal year.

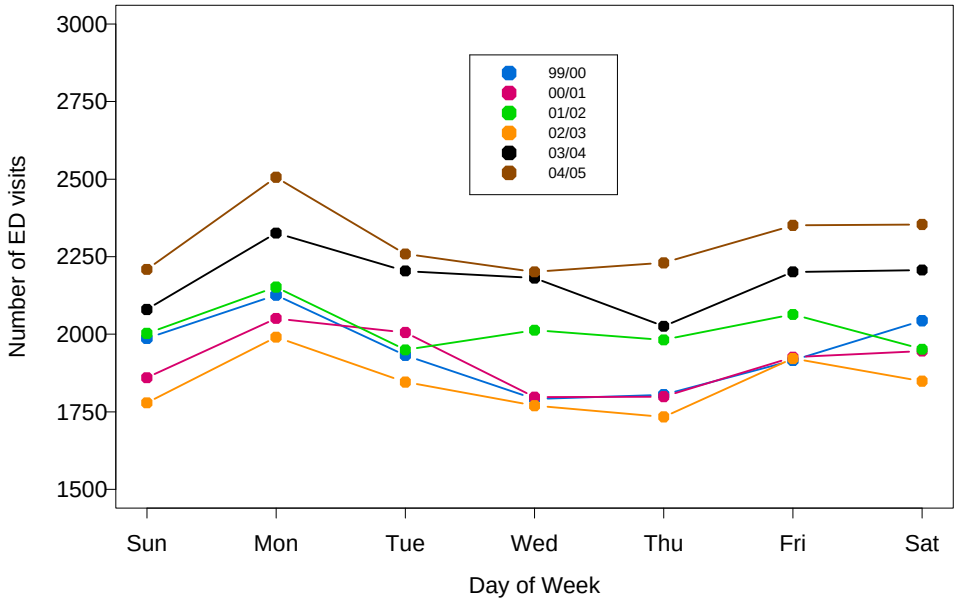


FIGURE 4.8: ED visits by hour of the day for each fiscal year.

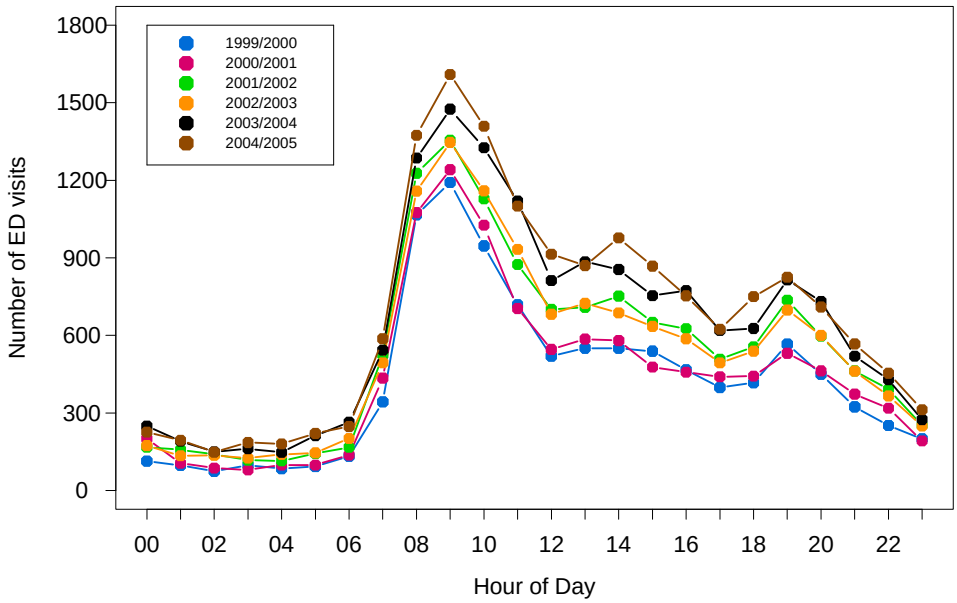
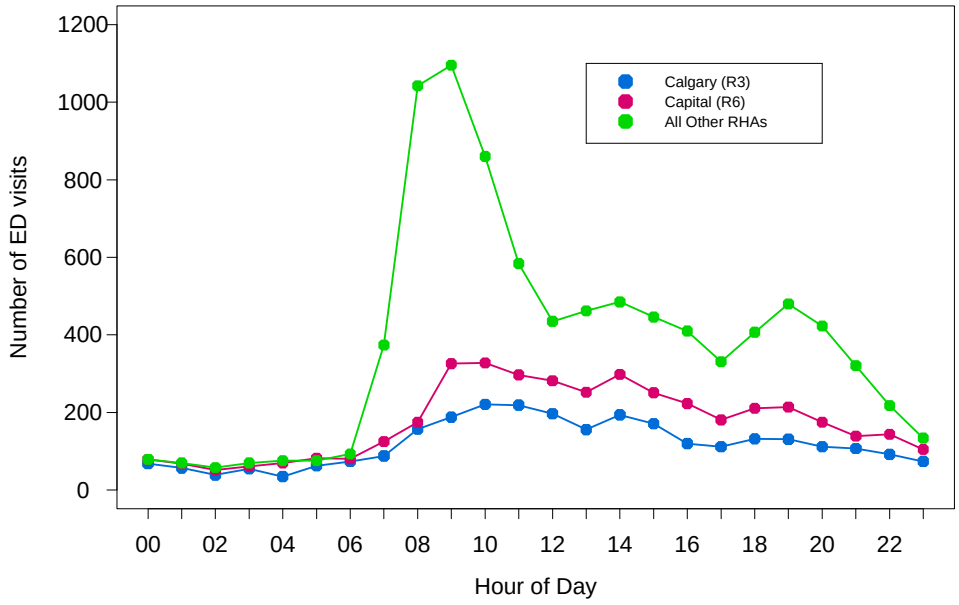


FIGURE 4.9: ED visits by hour of the day for selected regions, 2004/2005.

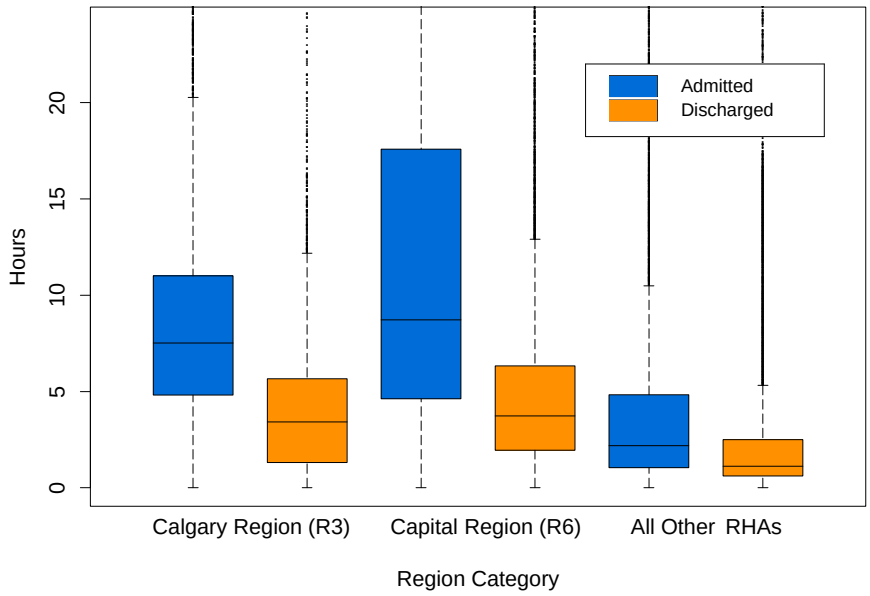


The median times were 4h 58m (IQR 2h 35m to 9h 33m) in Capital Health (R6), 5h 9m (IQR 2h 19m to 8h 20m) in the Calgary Health Region (R3), and 1h 17m (IQR 41m to 2h 57m) in all other RHAs combined. For the discharged individuals, the median ED visit times were 3h 44m (IQR 1h 57m to 6h 20m) for the Capital Region (R6), 3h 26m (IQR 1h 20m to 5h 41m) for the Calgary Region (R3) and 1h 6m (IQR 0h 36m to 2h 24m) for all other RHAs combined. The admitted individuals had median times of 8h 43m, 7h 32m and 2h 12m for the Capital Region, Calgary Region, and all other RHAs combined, respectively (Table 4.4, Figure 4.10).

TABLE 4.4: Duration of ED visit by admission or discharge status for individuals 55 years old and older. Median (Med), 25th percentile (25^{th}), 75th percentile (75^{th}) are provided.

	Capital (R6)			**Calgary(R3)**			**All Other RHAs**		
	Med	**25^{th}**	**75^{th}**	**Med**	**25^{th}**	**75^{th}**	**Med**	**25^{th}**	**75^{th}**
Admitted									
Duration time	8h 43m	4h 38m	17h 34m	7h 32m	4h 51m	11h 0m	2h 12m	1h 3m	4h 50m
Discharged									
Duration time	3h 44m	1h 57m	6h 20m	3h 26m	1h 20m	5h 41m	1h 6m	0h 36m	2h 24m

FIGURE 4.10: Duration of ED visits by admission or discharge status. The lower, middle, and upper boundaries of the boxes are the 25th percentile, median, and 75th percentile, respectively. The y-axis is truncated at 24 hours.



4.4 Outcomes

The vast majority of ED visits resulted in discharges from EDs (Table 4.5). In 2004/2005, 10,793 (67.0%) ED visits from 7,572 individuals resulted in discharge.

There were 4,886 admissions to other areas of the ED facility (30.3% of ED visits) involving 3,742 individuals (Figure 4.11). In addition, 167 ED visits (157 individuals) resulted in admission to critical care areas or operating rooms. Transfer to another facility was the outcome of 199 visits. The diagnoses for ED visits resulting in admission varied (Table 4.6); however, the vast majority (>80%) were related to COPD (70.5%) or pulmonary infections (17.3%). Co-morbid cardiac conditions (e.g., heart failure, ischemic heart disease, chest pain, etc.) represented a lower proportion of COPD admission (7.2%). Other serious conditions complicating COPD (e.g., pneumothorax [collapsed lung], pulmonary embolism or stroke) were reported infrequently (n = 22 visits). COPD associated with respiratory failure occurred in 89 patients (1.7%).

***32%** of visits resulted in admission from the ED.*

Thirty-seven visits had the status left against medical advice, and 22 visits were coded as expired in ambulatory care service. In addition, five ED visits were classified as expired on arrival to ambulatory care service.

TABLE 4.5: ED visits by disposition for each fiscal year and all years combined. The "–" denotes small counts.

	99/00	00/01	01/02	02/03	03/04	04/05	All
n	13,602	13,386	14,116	12,891	15,225	16,110	85,330
Discharged							
1 Discharged	8,840	9,036	9,649	8,633	10,271	10,791	57,220
2 Discharged from program of clinic	41	24	45	24	19	2	155
Admitted							
4 Admitted to CCU or OR	154	171	140	161	178	167	971
5 Admitted to other area	4,377	3,972	4,054	3,841	4,527	4,886	25,657
6 Admitted to another facility	163	152	182	190	191	199	1,077
Expired							
7 Expired in ambulatory care service	9	9	14	18	9	22	81
8 Expired on arrival to ambulatory care service	–	–	–	–	–	–	25
Left Before Completion of Care							
3 Left against medical advice	15	16	27	17	27	37	139
9 Left without being seen	–	–	–	–	–	–	5

FIGURE 4.11: ED visits resulting in discharge (disposition=1,2) or admission (disposition=4,5,6) for each fiscal year.

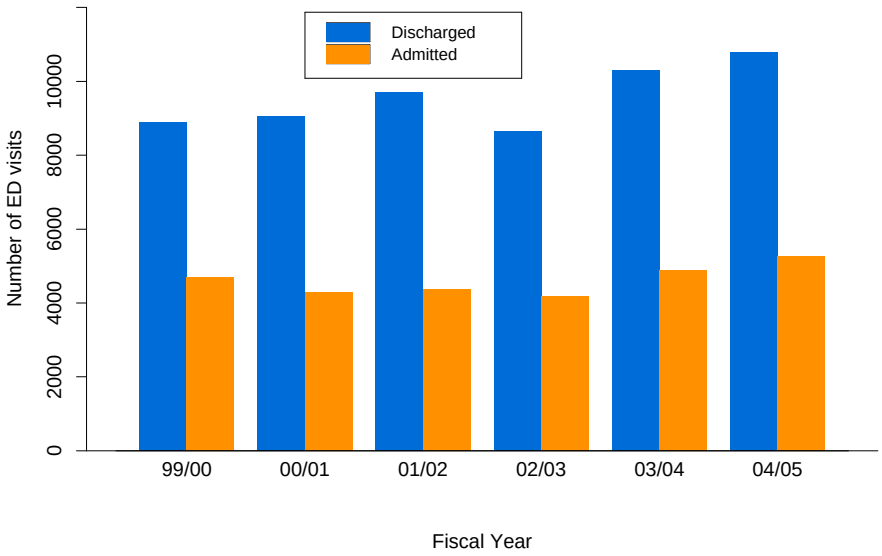


TABLE 4.6: First diagnosis reported for ED visits resulting in admission, 2004/2005. The "–" denotes small counts.

Diagnosis Categories	**Count (%)**
n	5,252
COPD and COPD-related	3,702 (70.5)
Exacerbation	2,036 (38.8)
Chronic airway obstruction	1,153 (22.0)
Bronchitis	214 (4.1)
Respiratory failure	89 (1.7)
Emphysema	39 (0.7)
Bronchiectasis	38 (0.7)
Other	133 (2.3)
Lung Infection	908 (17.3)
Lower respiratory tract infection (not pneumonia)	737 (14.0)
Pneumonia	171 (3.3)
Cardiac disease	379 (7.2)
Congestive heart failure	251 (4.8)
Ischemic heart disease	38 (0.7)
Atrial fibrillation and flutter	29 (0.6)
Chest pain and non-specific chest pain	31 (0.6)
Other	30 (0.6)
Gastro-intestinal	57 (1.1)
Neurological	38 (0.6)
TIA/stroke	11 (0.2)
Other	27 (0.5)
Cancers	28 (0.5)
Endocrine, nutritional and metabolic	26 (0.5)
Fluid, electrolyte and acid-balance disorder	14 (0.3)
Diabetes	12 (0.2)
Genito-urinary	21 (0.4)
Psychiatric	18 (0.3)
Musculo-skeletal and connective tissue	15 (0.3)
Thrombosis, hemostasis and blood	–
Fractures	–
Skin and subcutaneous tissue	–
Other	43 (0.8)

Of the 22 individuals who expired in ambulatory care service in 2004/2005, eight were female and 14 were male. Seniors numbered 20 and the other two individuals, a 61 year old male and a 62 year old female, were from the Registrant without Subsidy and Government Sponsored groups, respectively. Overall, pre-death ED visits were uncommon, with nine out of 22 having no previous or one previous ED visit during the study period. Three individuals, all seniors and male, had a much higher number of visits (24, 28 and 32) than the others, prior to the final ED visit.

In 2004/2005, 167 patients were admitted to critical care areas; seven individuals were admitted to critical care (CC) areas on two separate occasions and one individual had four CC admissions. The remaining 149 individuals (68 females, 81 males) had exactly one ED visit that resulted in admission to critical care areas and had a total of 620 ED visits during the study period. Their ages ranged from 55 to 91 years, with a median age of 74 years. For 50 of the ED visits, the first diagnostic code was not COPD. The first diagnostic codes for these individuals included among others: unspecified respiratory problems, acute respiratory failures and congestive heart failure.

4.5 Repeat Visits

The majority of individuals (63.8%) visited the ED only once during the entire study period (Table 4.7). The remaining individuals, generally visited the ED less than ten times during the six year study period. Fewer than 2.5% of individuals (889) visited the ED more than ten times, with 872 visiting 11 to 50 times, 15 visiting 51 to 100 times, and 2 visiting over 100 times (105 and 106 times).

TABLE 4.7: Frequency and percentage (%) of ED COPD visits per individual.

	Number of ED visits						
	1	**2**	**3**	**4**	**5**	**6-10**	**>10**
Individuals	24,633 (63.8)	6,208 (16.1)	2,702 (7.0)	1,452 (3.8)	906 (2.3)	1,848 (4.8)	889 (2.3)

4.6 Regional Variation

Of the 85,320 ED visits reporting both sRHA of residence at end of fiscal year and sRHA of facility where ED visit was made, 65.0% (55,472) had the same sRHA for both residence and ED facility. When RHA is examined, 94.4% (80,560) visits had the same RHA for both residence and ED facility.

The sex and age group directly standardized visit rates have stayed relatively stable for most regions over the study period when all ages are considered and the Alberta population from the 1999/2000 year is used as a reference (Table 4.8, Figure 4.12). Capital Health (R6) and the Calgary Health Region (R3) had the lowest directly standardized rates. These were lower than the overall provincial rate of 25.6 ED visits per 1000 individuals ($\geq$ 55 years) in 2004/2005 (Figure 4.13). Most of the other RHAs had higher DVSRs than the provincial rate. The RHA with the highest rate in 2004/2005, Peace Country Health (R8), had about three to four times the standardized rate of ED visits of the larger urban areas (Capital Health and Calgary Health Region).

Peace Country & Northern Lights had $\approx$ ***3 times higher*** *adjusted visit rates than Capital and Calgary in 04/05.*

TABLE 4.8: Sex and age group directly standardized visit rates per 1,000 population by RHA for each fiscal year.

	99/00	**00/01**	**01/02**	**02/03**	**03/04**	**04/05**
All Alberta						
	25.6	24.4	24.8	21.8	25.0	25.6
Regional Health Authority of Residence						
R1 Chinook Regional Health Authority	27.8	27.5	32.6	22.2	25.0	23.8
R2 Palliser Health Region	20.6	17.0	13.3	15.2	18.9	21.7
R3 Calgary Health Region	15.3	13.8	13.8	12.9	13.7	13.9
R4 David Thompson Regional Health Authority	46.6	38.2	40.9	31.5	38.4	42.8
R5 East Central Health	40.3	44.8	49.3	37.5	39.9	41.8
R6 Capital Health	19.0	18.6	18.6	18.0	20.8	20.7
R7 Aspen Regional Health	46.7	51.9	47.9	44.9	53.5	51.1
R8 Peace Country Health	61.9	56.7	60.1	54.4	63.8	68.4
R9 Northern Lights Health Region	43.4	50.0	45.6	48.5	63.4	62.7

FIGURE 4.12: Sex and age group directly standardized visit rates (DSVRs) per 1,000 population and 95% confidence intervals by RHA for each fiscal year.

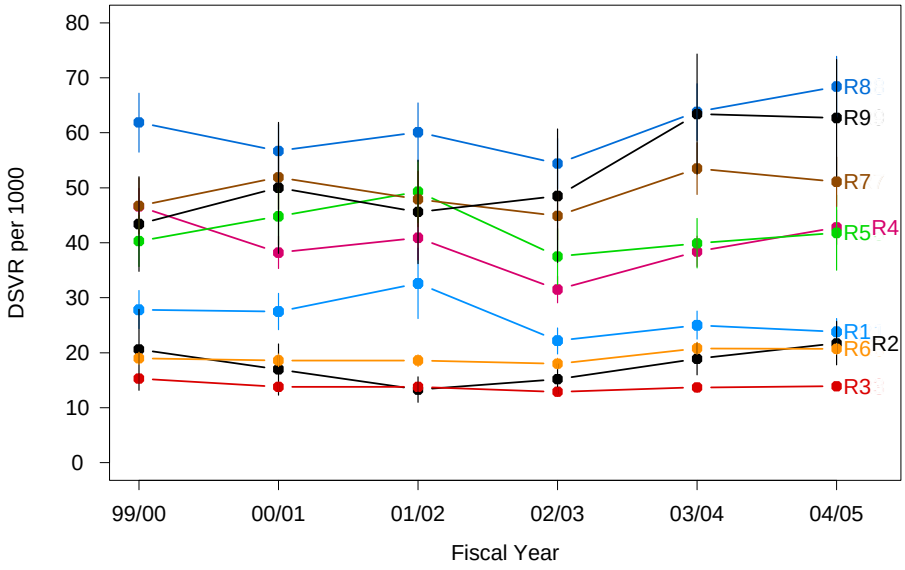
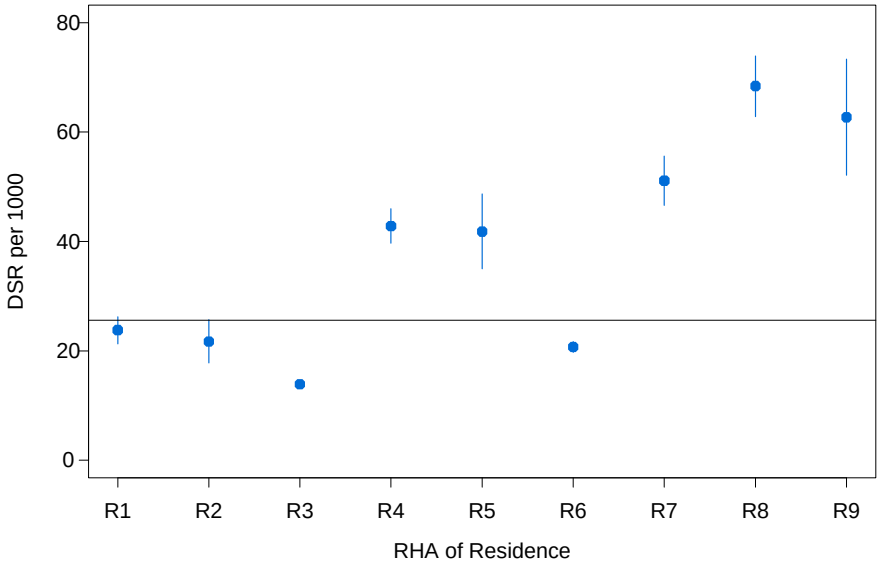


FIGURE 4.13: Sex and age group directly standardized visit rates (DSVRs) per 1,000 population and 95% confidence intervals by RHA, 2004/2005.



4.7 Follow-up Visits After COPD ED Visits for the Discharged Subset

Only the most recent year was used for the follow-up tracking. Between November 1, 2003, and October 31, 2004, there were 7,302 individuals (3,683 male) discharged from the ED and these data formed our discharged subset (i.e., 7,302 index visits). Of the 2,330 individuals who where less than 65 years of age, 195 (8.4%), 474 (20.3%), 320 (13.7%), and 1,341 (57.6%) individuals were from the Aboriginal, Government Sponsored, Welfare, and Registrant without Subsidy groups, respectively.

Of the 7,302 individuals in the discharged subset, 6,415 had at least one follow-up visit. In the seven days following the 6,415 ED visits, 20.6% were primarily for COPD (5,749 follow-up visits, Table 4.9). At 30 days, there were 20,032 follow-up visits and at 365 days, there were 172,597 follow-up visits. Nearly half of the individuals with a follow-up visit had had at least one follow-up visit within 7 days following the ED visit (2887/6415, 45.0%). There were slightly more follow-up visits from males than females at each time frame (at 365 days: 88,416 for males, 84,181 for females). Among individuals aged 55–64 years, the Welfare group represented 13.7% of the individuals in the discharged subset but had 20.7%, 20.1%, and 22.6% of the follow-up visits at 7, 30, and 365 days, respectively. Fewer of the follow-up visits were primarily for COPD as the time since ED visit increased.

*There were **5,749** follow-up visits within 7 days of ED discharge.*

General practitioners were the most common physician group seen, accounting for 68.6%, 62.0%, and 62.2% of the follow-up visits at 7, 30, and 365 days after an ED visit, respectively. The follow-up visits at 7 days were roughly split between active treatment hospital (48.1%), including active treatment clinic and active ambulatory care center, and practitioners' offices (44.3%). The latter became more common as the time since the ED discharge increased.

Of the 7,302 individuals in the discharged subset, 1,871 individuals (25.6%) had a repeat ED visit during the first year. At 7 days after the index ED visit, about 5.7% (416/7302) of individuals had returned to the ED for another visit (Figure 4.14). For the individuals aged 55–64 years, the groups differed (p <0.001)). For the Aboriginal group, 1.5% (3/195) had returned to the ED within seven days of the index ED visit. For the Welfare group, 6.6% (21/320) had returned within the same time frame.

***7%** of Welfare recipients returned to the ED for COPD within 7 days of ED discharge.*

At seven days after the index ED visit, approximately 62% of individuals had yet to have a non-

TABLE 4.9: Follow-up visits at 7, 14, 30, 90 and 365 days after ED visit for the discharged subset.

	Days Since ED Visit End Date				
	7	**14**	**30**	**90**	**365**
n	5,749	10,552	20,032	49,639	172,597
Age Group					
55-59	719 (12.5)	1,319 (12.5)	2,577 (12.9)	6,460 (13.0)	24,309 (14.1)
60-64	700 (12.2)	1,317 (12.5)	2,437 (12.2)	6,271 (12.6)	22,507 (13.0)
65-69	947 (16.5)	1,710 (16.2)	3,155 (15.7)	7,766 (15.6)	26,110 (15.1)
70-74	948 (16.5)	1,730 (16.4)	3,417 (17.1)	8,607 (17.3)	28,619 (16.6)
75-79	1,106 (19.2)	2,031 (19.2)	3,752 (18.7)	9,004 (18.1)	31,720 (18.4)
80+	1,329 (23.1)	2,445 (23.2)	4,694 (23.4)	11,531 (23.2)	39,332 (22.8)
Sex					
F	2,760 (48.0)	5,056 (47.9)	9,522 (47.5)	23,741 (47.8)	84,181 (48.8)
M	2,989 (52.0)	5,496 (52.1)	10,510 (52.5)	25,898 (52.2)	88,416 (51.2)
pSES (age 55–64 yrs)					
A	120 (8.5)	205 (7.8)	398 (7.9)	1,212 (9.5)	5,100 (10.9)
R	670 (47.2)	1,280 (48.6)	2,452 (48.9)	5,923 (46.5)	21,190 (45.3)
S	335 (23.6)	625 (23.7)	1,155 (23.0)	2,751 (21.6)	9,949 (21.3)
W	294 (20.7)	526 (20.0)	1,009 (20.1)	2,845 (22.3)	10,577 (22.6)
mSES (age $\geq$ 55 yrs)					
A	271 (4.7)	494 (4.7)	938 (4.7)	2,613 (5.3)	10,667 (6.2)
nonA	5,478 (95.3)	10,058 (95.3)	19,094 (95.3)	47,026 (94.7)	161,930 (93.8)
Diagnosis					
COPD	1,187 (20.6)	1,966 (18.6)	3,330 (16.6)	7,084 (14.3)	20,897 (12.1)
Missing	210 (3.7)	453 (4.3)	1,021 (5.1)	2,475 (5.0)	8,939 (5.2)
Physician Type					
GP	3,941 (68.6)	6,883 (65.2)	12,426 (62.0)	30,253 (60.9)	107,405 (62.2)
INMD	468 (8.1)	976 (9.2)	1,949 (9.7)	4,709 (9.5)	13,907 (8.1)
RSMD	143 (2.5)	295 (2.8)	686 (3.4)	1,840 (3.7)	5,287 (3.1)
Other	670 (11.7)	1,540 (14.6)	3,390 (16.9)	9,210 (18.6)	33,970 (19.7)
Facility Type					
ACT	2,763 (48.1)	4,718 (44.7)	8,524 (42.6)	20,096 (40.5)	67,319 (39.0)
OFFC	2,549 (44.3)	4,981 (47.2)	9,734 (48.6)	24,833 (50.0)	86,375 (50.0)
Other	437 (7.6)	853 (8.1)	1,774 (8.9)	4,710 (9.5)	18,903 (11.0)

FIGURE 4.14: Time to next ED visit for the discharged subset (7,302) and by pSES for individuals aged 55–64 years (2,330).

(a) All (b) pSES (age 55–64 yrs)

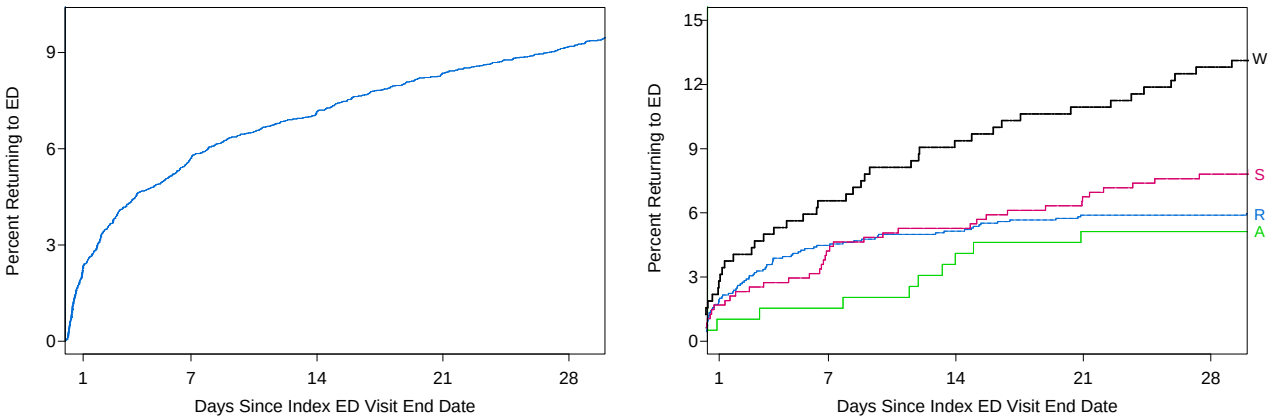
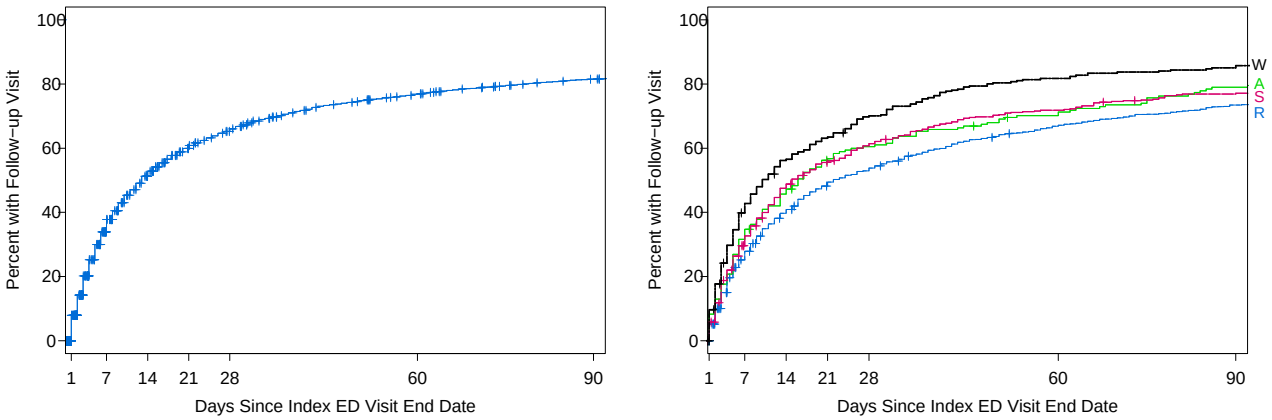


FIGURE 4.15: Time to first follow-up visit for the discharged subset (7,302) and by pSES for individuals aged 55–64 years (2,330). The plus signs denote individuals whose time to follow-up visit is censored.

(a) All (b) pSES (age 55–64 yrs)



43% *of Welfare recipients had a follow-up visit within 7 days of ED discharge.*

ED follow-up visit (Figure 4.15). The estimated median time to the first follow-up visit was 13 days. Differences were seen in the four pSES groups ($p < 0.001$). The Aboriginal and the Government Sponsored Program had very similar patterns with estimated median times of 16 and 15 days, respectively. The Registrant without Subsidy group had the largest estimated median time of 22 days. Conversely, the estimated median time for the Welfare group was 10 days. Seven days after the ED visit end date, about 43% of individuals in the Welfare group had had a non-ED follow-up visit for COPD.

5 Discussion

Compared to other respiratory conditions, COPD is a relatively frequent presentation to the ED and COPD is a growing and important health care presentation. The socio-demographic and seasonal patterns coupled with the potential for severe consequences (e.g., hospitalization, ICU admission and death) together justify continued exploratory and hypothesis-driven research in this area.

This study explored acute COPD as seen in over 100 EDs in the province of Alberta over a six year period. The strength of the ACCS database is that it contains comprehensive information regarding all COPD visits made by Albertans to EDs in the province. Moreover, the potential linkage of ACCS to registry (demographics) and health services (outcomes) data is an important advantage over simple cross-sectional research. The results from this study identify some important epidemiological trends and outcome information not previously explored; in addition, this is the most comprehensive provincial analysis of its kind for this respiratory problem. First, with increasing population figures for most regions of the province, the overall number of COPD visits to EDs across Alberta has also generally increased; however, the rate of visits remained the same. There may be a variety of explanations for our failure to identify increased rates despite worldwide statistics that suggest increasing incidence of the disease. For example, factors including but not limited to: ED overcrowding, improved access to after hours care in major centres, and improved application of evidence based management by practicing physicians may help to blunt the ED pressures related to this disease. ED overcrowding has been a growing concern across Alberta, especially in high volume, urban and teaching centres.[21] COPD patients likely realize this and select alternative after hours encounter settings. Second, access to after hours care has improved with the development of walk in clinics in most urban and semi urban centres. Finally, the use of inhaled long-acting anti-cholinergic (LAAC) and beta-agonists (LABA) agents alone or in combination has been increasing in Canada, which has likely further improved COPD control and reduced ED visits. Further research is required to determine the relative contributions of these factors.

In addition, the study was able to provide additional data regarding some important and "high-risk" populations who visit the ED with COPD. For example, visit rates are particularly high amongst individuals under 65 years with Aboriginal status or on Welfare. Males over age 65 are more likely to visit an emergency department for COPD than females. These data do not necessarily suggest that women are at lower risk for COPD, since considerable data exists to suggest that females have a growing incidence of COPD. In fact, since this is the case, future research will likely see both increasing rates and severity of COPD presentations for women. Moreover, other ED research suggests that men and women who present to the ED for treatment of COPD exacerbation have substantial differences in chronic medication use, self-treatment during exacerbation, delay in emergency care, and post-ED outcomes.[22]

The data also suggest a vulnerability to the illness among persons of the extreme age group and suggests that interventions such as rehabilitation for this group may help decrease ED visits and reduce the burden on EDs. Although a higher presentation rate occurred in elderly patients, it is unlikely that the differences observed in these data are related to increased concerns about overall health or a greater tendency to seek treatment. Rather, these represent a genuine difference in the epidemiology of COPD.

The outcomes for patients presenting with this disease differ from that seen in other respiratory conditions such as asthma.[23] For example in our previous work, only 9% of patients with asthma presenting to the ED with an exacerbation were admitted, compared to 32% in this cohort. Moreover, the frequency of critical care admissions and death are dramatically higher than asthma.[23] In a study of admission after ED care, North American investigators found that six patient factors were independently associated with hospital admission.[24] In a more selective sample, Canadian investigators recently demonstrated that historical, severity and treatment-related factors were strongly associated with hospital admission.[25] Validation of these results is required; however, the data here and elsewhere suggests that clinical tools to assist physicians in making these admission decisions may be critically important for patient safety.

Patients with COPD occupy ED stretchers for prolonged periods, contributing to the problem with ED overcrowding.[21] Given than many of these patients have serious co-morbidities (e.g., coronary artery disease, hear failure, diabetes, hypertension, etc) as well as advanced age and respond slowly to treatments further exacerbates the overcrowding even when patients are discharged from the ED. Finally, knowing that many patients with acute COPD require respiratory support, in the form of non-invasive ventilation or intubation, these results suggest that the economic consequences of this disease are impressive. Clearly, efforts to reduce ED visits and severity for COPD should be a priority within this and other Canadian health care settings.

This study spans six fiscal years. The pattern of COPD-related emergency department visits showed an association with age, sex, the time of day, and day of week. Unlike other respiratory problems in adults (e.g., community acquired pneumonia, influenza, etc.) there was less variation

based on the time of year. The daily cycle of COPD visits was similar to the visitation cycle of all emergency department visits.[26] The tendency for cases to be reported on at certain periods of the day is an observation of particular interest, and may be explained by general ED utilization patterns. Specifically, time of visit may partly represent the time that is most convenient for people to report to an ED, or when it is least convenient to visit an alternative health care provider.

Standardized ED visit rates, adjusting for different age group and sex distributions, generally stayed the same from 1999/2000 to 2004/2005. In 2004/2005, rates were lowest in the two largest and most urbanized areas of the province. The difference between the regions with the lowest rate, found in the Calgary Regional Health Authority (13.9/1000) and the Capital Health (20.7/1000), and the highest rate (68.4/1000), found in the Peace Country Health Region, could point to substantive differences in the rates of smoking, availability of alternative sources of care other than the ED in these regions, or in the patterns of medical practice in non-urban settings (e.g., the ED may be used as a walk-in clinic). Methods of diagnosis and/or distribution of high-risk populations must also be considered; for example, patients with severe or ED-stage COPD may relocate to regions where specialized care is available. Moreover, large Aboriginal communities located in a region may skew the data somewhat. Further research is required to help explain these geographic variations.

These data reveal that persons in Welfare or Aboriginal subgroups are considerably more likely to visit an ED for COPD than other members of Alberta's population 55 to 64 years of age. This may partially explain the high visitation rates in many of the northern health regions, where the population of Aboriginal persons is high. Physician claims data have historically shown that Aboriginal Albertans suffer from higher rates of respiratory illness in general, conditions such as pneumonia, bronchitis, and respiratory infection.[27]

Canadian COPD consensus guidelines recommend that patients be regularly followed for their condition by a primary care provider, or in cases of severe disease, a specialist (Pulmonologist).[28] Following an acute exacerbation requiring ED presentation, this follow-up re-assessment is even more critical. While largely unstudied, the guidelines recommend a re-assessment by the primary care provider; however, the timing of this follow-up is unclear. ED visits often represent failure of the chronic management of patients with COPD, so it makes good sense that follow-up with the primary care provider should be encouraged and completed. Despite this, the frequency and intensity of post-ED follow-up visits are not known in great detail, since most COPD follow- up reported in research studies is spuriously high due to study participation.

For a large sample of patients discharged from the ED during a one year period, follow-up visits were made in non-ED settings for a variety of reasons and at different intervals. About 21% of follow-up visits in the seven days after ED visits were COPD-related. As the time from the original ED visit increased, the COPD-related follow-up visits decreased. Most follow-up visits were with general practitioners. The majority did not have a follow-up visit within the first seven

days after discharge from the ED. Only about 31% of the individuals had *any* follow-up visit during this time frame. Finally, this follow-up was influenced by other factors. For example, a *higher* proportion of the Welfare subgroup had a follow-up visit within 7 days (43%) compared to other subgroups (28–35%). Clearly, follow-up after an important ED visit for COPD is not occurring evenly and successfully across the province.

Relapse is an important issue after ED discharge. Early relapse may signify a failure of appropriate ED care, while later relapses may be related to medical, environmental or severity issues. In a study of relapse after discharge, North American investigators found patients with COPD suffered considerably.[29] In a more selective sample, Canadian investigators recently demonstrated that past COPD control (ED visits in past 2 years), ED treatments (oxygen) and initial vital signs (respiratory rate, earliest peak flow and oxygen saturation) but not treatment issues were associated with COPD relapse.[30] Validation of these results should be completed prior to widespread acceptance in Canada.

6 Limitations

Since many individuals report to their family physicians or local clinics for treatment, the ED setting did not capture all cases of acute COPD in the study period. This statement is particularly so in the more urban centres of the Capital and Calgary regional health authorities. In addition to the limited ability of ED administrative data to capture the "true" incidence of the disease, many of the patterns observed could be the result of differences in emergency service delivery and not systematic differences in the distribution of the illness. Lower rates of ED COPD visits among the young elderly (55–65 yrs) may be a result of misclassification of COPD cases as "asthma" cases. It may even indicate a preference for emergency services in these populations. Conversely, evidence does suggest, however, that patients presenting to the ED receiving a diagnosis of COPD can be assumed to have the disease.[31]

Aboriginal status was based on Treaty Status, which remains a proxy measure for being Aboriginal. Specifically, this would exclude Metis, Inuit, and other culturally Aboriginal people who do not have Treaty Status. While this is a limitation and under-estimates the total number of Aboriginal patients in the sample, we do not feel this biases the results in a meaningful way.

The ACCS database provides limited information about disease management in the ED. For example, while some diagnostic codes are available, they are not coded specifically enough for one to determine the course of treatment received in the ED. This limits the reports ability to comment on the appropriateness of care. In addition, the results may not be generalizable to other settings. For example, evidence suggests that COPD treatment admissions differ between Canadian and US EDs.[32]

From the data perspective, caution must be used in the use of claims data for a variety of reasons. First, the claims do not capture the non-Alberta and non-registered Albertans (a growing number in the province). In addition, follow-ups outside the province are not identified (although these events are likely to be infrequent). Finally, data are only as good as the records kept by medical staff. Few EDs have a truly computerized EDIS, so data on times tends to be variably recorded. Consequently, missing information is common in this database. Despite these concerns, the ACCS data has been shown to be valid and reliable, and we feel these problems do not negate the trends identified and true bias is limited.

7 Conclusion

COPD is a common presenting problem in Alberta EDs and the variations in presentation are impressive. Further study of these trends is required in order to understand the associated factors relating to these variations. The impressive findings are an overall increase in the number of presentations over the study period, relatively stable rates of presentation over the study period, and the disparities in presentations based on age, sex, pSES, region, and cultural status. Understanding these presentations should assist policy makers in addressing specific groups for targeted interventions.

A Population Demographics

The appendices display tables and figures of detailed information. Totals (n) are provided. Frequencies are provided for each category as well as the percentage in brackets (%). Unless otherwise stated, analyses are for individuals with ages $\geq$ 55 years.

TABLE A.1: Population by age group for each fiscal year.

	99/00	00/01	01/02	02/03	03/04	04/05
n	531,467	548,534	572,529	597,085	618,445	642,205
55-59	129,431 (24.4)	135,268 (24.7)	146,978 (25.7)	158,544 (26.6)	167,091 (27.0)	176,968 (27.6)
60-64	102,836 (19.3)	105,722 (19.3)	110,136 (19.2)	115,230 (19.3)	120,634 (19.5)	126,021 (19.6)
65-69	92,178 (17.3)	93,029 (17.0)	93,638 (16.4)	94,903 (15.9)	96,580 (15.6)	98,603 (15.4)
70-74	77,676 (14.6)	80,076 (14.6)	82,248 (14.4)	83,662 (14.0)	84,554 (13.7)	85,401 (13.3)
75-79	59,778 (11.2)	61,320 (11.2)	62,317 (10.9)	64,072 (10.7)	65,960 (10.7)	68,194 (10.6)
80+	68,843 (13.0)	72,448 (13.2)	76,628 (13.4)	80,172 (13.4)	83,221 (13.5)	86,674 (13.5)
Missing	725 (0.1)	671 (0.1)	584 (0.1)	502 (0.1)	405 (0.1)	344 (0.1)

TABLE A.2: Population by sex for each fiscal year.

	99/00	00/01	01/02	02/03	03/04	04/05
n	531,467	548,534	572,529	597,085	618,445	642,205
F	281,903 (53.0)	290,675 (53.0)	302,808 (52.9)	315,101 (52.8)	325,906 (52.7)	337,611 (52.6)
M	249,564 (47.0)	257,859 (47.0)	269,721 (47.1)	281,984 (47.2)	292,539 (47.3)	304,594 (47.4)

TABLE A.3: Population by pSES (age 55–64) for each fiscal year.

	99/00	00/01	01/02	02/03	03/04	04/05
n	232,267	240,990	257,114	273,774	287,725	302,989
A	4,254 (1.8)	4,501 (1.9)	4,856 (1.9)	5,212 (1.9)	5,463 (1.9)	5,778 (1.9)
R	180,365 (77.7)	189,335 (78.6)	206,401 (80.3)	222,589 (81.3)	236,089 (82.1)	230,491 (76.1)
S	37,356 (16.1)	36,628 (15.2)	35,038 (13.6)	34,503 (12.6)	34,072 (11.8)	54,111 (17.9)
W	10,292 (4.4)	10,526 (4.4)	10,819 (4.2)	11,470 (4.2)	12,101 (4.2)	12,609 (4.2)

TABLE A.4: Population by mSES for each fiscal year.

	99/00	00/01	01/02	02/03	03/04	04/05
n	531,467	548,534	572,529	597,085	618,445	642,205
A	6,896 (1.3)	7,367 (1.3)	7,881 (1.4)	8,460 (1.4)	8,948 (1.4)	9,429 (1.5)
nonA	524,571 (98.7)	541,167 (98.7)	564,648 (98.6)	588,625 (98.6)	609,497 (98.6)	632,776 (98.5)

TABLE A.5: Population by sex and age group for each fiscal year.

		99/00	00/01	01/02	02/03	03/04	04/05
F	n	281,903	290,675	302,808	315,101	325,906	337,611
	55–59	63,942 (22.7)	66,874 (23.0)	72,741 (24.0)	78,423 (24.9)	82,807 (25.4)	87,616 (26.0)
	60–64	51,509 (18.3)	52,929 (18.2)	55,102 (18.2)	57,528 (18.3)	60,176 (18.5)	62,808 (18.6)
	65–69	46,482 (16.5)	47,001 (16.2)	47,381 (15.6)	48,199 (15.3)	49,171 (15.1)	50,108 (14.8)
	70–74	40,933 (14.5)	41,956 (14.4)	42,892 (14.2)	43,517 (13.8)	43,808 (13.4)	44,235 (13.1)
	75–79	34,295 (12.2)	34,945 (12.0)	35,156 (11.6)	35,759 (11.3)	36,427 (11.2)	37,301 (11.0)
	80+	44,592 (15.8)	46,829 (16.1)	49,416 (16.3)	51,576 (16.4)	53,439 (16.4)	55,487 (16.4)
	Missing	150 (0.1)	141 (0.0)	120 (0.0)	99 (0.0)	78 (0.0)	56 (0.0)
M	n	249,564	257,859	269,721	281,984	292,539	304,594
	55–59	65,489 (26.2)	68,394 (26.5)	74,237 (27.5)	80,121 (28.4)	84,284 (28.8)	89,352 (29.3)
	60–64	51,327 (20.6)	52,793 (20.5)	55,034 (20.4)	57,702 (20.5)	60,458 (20.7)	63,213 (20.8)
	65–69	45,696 (18.3)	46,028 (17.9)	46,257 (17.1)	46,704 (16.6)	47,409 (16.2)	48,495 (15.9)
	70–74	36,743 (14.7)	38,120 (14.8)	39,356 (14.6)	40,145 (14.2)	40,746 (13.9)	41,166 (13.5)
	75–79	25,483 (10.2)	26,375 (10.2)	27,161 (10.1)	28,313 (10.0)	29,533 (10.1)	30,893 (10.1)
	80+	24,251 (9.7)	25,619 (9.9)	27,212 (10.1)	28,596 (10.1)	29,782 (10.2)	31,187 (10.2)
	Missing	575 (0.2)	530 (0.2)	464 (0.2)	403 (0.1)	327 (0.1)	288 (0.1)

TABLE A.6: Population by sex and pSES (age 55–64) for each fiscal year.

		99/00	00/01	01/02	02/03	03/04	04/05
F	n	115,451	119,803	127,843	135,951	142,983	150,424
	A	2,127 (1.8)	2,274 (1.9)	2,478 (1.9)	2,665 (2.0)	2,815 (2.0)	3,018 (2.0)
	O	83,898 (72.7)	88,431 (73.8)	96,999 (75.9)	104,834 (77.1)	111,648 (78.1)	101,154 (67.2)
	S	24,220 (21.0)	23,814 (19.9)	22,877 (17.9)	22,628 (16.6)	22,397 (15.7)	39,814 (26.5)
	W	5,206 (4.5)	5,284 (4.4)	5,489 (4.3)	5,824 (4.3)	6,123 (4.3)	6,438 (4.3)
M	n	116,816	121,187	129,271	137,823	144,742	152,565
	A	2,127 (1.8)	2,227 (1.8)	2,378 (1.8)	2,547 (1.8)	2,648 (1.8)	2,760 (1.8)
	O	96,467 (82.6)	100,904 (83.3)	109,402 (84.6)	117,755 (85.4)	124,441 (86.0)	129,337 (84.8)
	S	13,136 (11.2)	12,814 (10.6)	12,161 (9.4)	11,875 (8.6)	11,675 (8.1)	14,297 (9.4)
	W	5,086 (4.4)	5,242 (4.3)	5,330 (4.1)	5,646 (4.1)	5,978 (4.1)	6,171 (4.0)

FIGURE A.1: Population by age group and gender, 2004/2005.

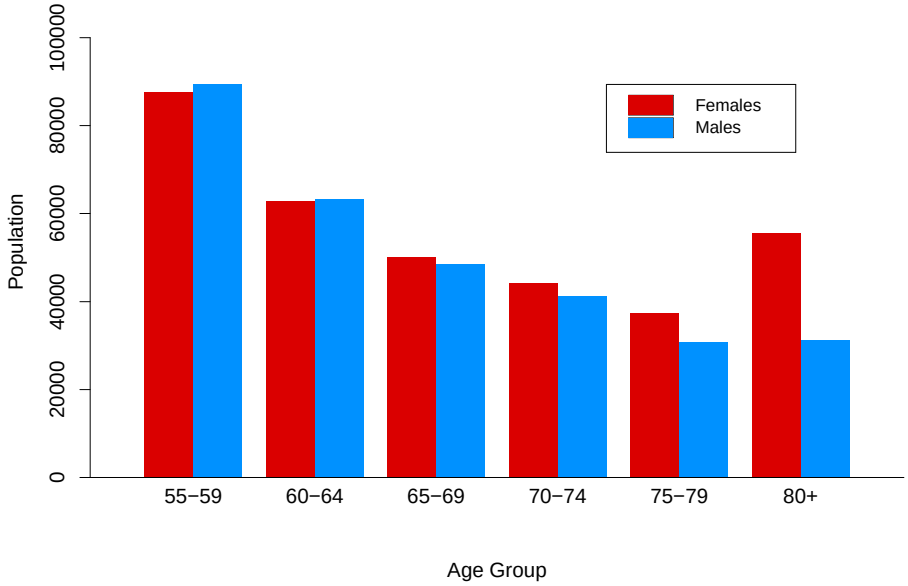


TABLE A.7: Population by sex and mSES for each fiscal year.

		99/00	00/01	01/02	02/03	03/04	04/05
F	n	281,903	290,675	302,808	315,101	325,906	337,611
	A	3,485 (1.2)	3,748 (1.3)	4,043 (1.3)	4,349 (1.4)	4,612 (1.4)	4,907 (1.5)
	nonA	278,418 (98.8)	286,927 (98.7)	298,765 (98.7)	310,752 (98.6)	321,294 (98.6)	332,704 (98.5)
M	n	249,564	257,859	269,721	281,984	292,539	304,594
	A	3,411 (1.4)	3,619 (1.4)	3,838 (1.4)	4,111 (1.5)	4,336 (1.5)	4,522 (1.5)
	nonA	246,153 (98.6)	254,240 (98.6)	265,883 (98.6)	277,873 (98.5)	288,203 (98.5)	300,072 (98.5)

TABLE A.8: Population by residential RHA for each fiscal year.

	99/00		**00/01**		**01/02**		**02/03**		**03/04**		**04/05**	
n	531,467		548,534		572,529		597,085		618,445		642,205	
R1	32,042	(6.0)	32,673	(6.0)	33,571	(5.9)	34,587	(5.8)	35,320	(5.7)	36,336	(5.7)
R2	19,373	(3.6)	19,829	(3.6)	20,387	(3.6)	20,924	(3.5)	21,499	(3.5)	22,024	(3.4)
R3	172,251	(32.4)	179,108	(32.7)	188,888	(33.0)	199,005	(33.3)	207,819	(33.6)	217,602	(33.9)
R4	53,618	(10.1)	54,960	(10.0)	56,803	(9.9)	59,092	(9.9)	60,956	(9.9)	63,047	(9.8)
R5	26,363	(5.0)	26,777	(4.9)	27,307	(4.8)	27,888	(4.7)	28,048	(4.5)	28,684	(4.5)
R6	173,068	(32.6)	178,766	(32.6)	186,847	(32.6)	194,506	(32.6)	201,652	(32.6)	209,039	(32.6)
R7	30,679	(5.8)	31,405	(5.7)	32,522	(5.7)	33,529	(5.6)	34,374	(5.6)	35,474	(5.5)
R8	19,436	(3.7)	20,047	(3.7)	20,841	(3.6)	21,729	(3.6)	22,510	(3.6)	23,336	(3.6)
R9	4,625	(0.9)	4,958	(0.9)	5,348	(0.9)	5,805	(1.0)	6,246	(1.0)	6,645	(1.0)
Missing	12	(0.0)	11	(0.0)	15	(0.0)	20	(0.0)	21	(0.0)	18	(0.0)

B ED Visit Demographics

TABLE B.1: ED visits and distinct individuals for each fiscal year and all years combined.

	99/00	00/01	01/02	02/03	03/04	04/05	All
Visits	13,602	13,386	14,116	12,891	15,225	16,110	85,330
Distinct Individuals	8,750	8,323	8,749	8,448	9,916	10,485	38,638

FIGURE B.1: ED visits and distinct individuals by fiscal year.

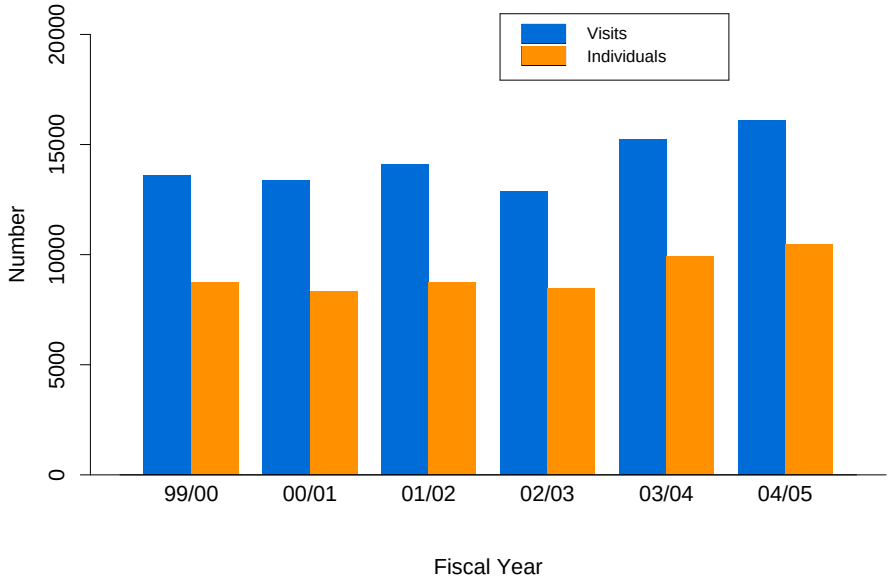


TABLE B.2: ED visits and distinct individuals by age group for each fiscal year and all years combined.

	99/00	00/01	01/02	02/03	03/04	04/05	All
ED Visits							
n	13,602	13,386	14,116	12,891	15,225	16,110	85,330
55-59	1,537 (11.3)	1,574 (11.8)	1,626 (11.5)	1,370 (10.6)	1,986 (13.0)	2,010 (12.5)	10,103 (11.8)
60-64	1,769 (13.0)	1,709 (12.8)	1,832 (13.0)	1,616 (12.5)	1,975 (13.0)	2,034 (12.6)	10,935 (12.8)
65-69	2,152 (15.8)	2,171 (16.2)	2,317 (16.4)	2,066 (16.0)	2,418 (15.9)	2,435 (15.1)	13,559 (15.9)
70-74	2,541 (18.7)	2,339 (17.5)	2,648 (18.8)	2,296 (17.8)	2,638 (17.3)	2,848 (17.7)	15,310 (17.9)
75-79	2,660 (19.6)	2,422 (18.1)	2,458 (17.4)	2,271 (17.6)	2,583 (17.0)	2,888 (17.9)	15,282 (17.9)
80+	2,943 (21.6)	3,171 (23.7)	3,235 (22.9)	3,272 (25.4)	3,625 (23.8)	3,895 (24.2)	20,141 (23.6)
Distinct Individuals							
n	8,750	8,323	8,748	8,448	9,916	10,485	38,638
55-59	1,120 (12.8)	1,096 (13.2)	1,052 (12.0)	1,028 (12.2)	1,385 (14.0)	1,485 (14.2)	
60-64	1,149 (13.1)	1,107 (13.3)	1,163 (13.3)	1,121 (13.3)	1,346 (13.6)	1,384 (13.2)	
65-69	1,325 (15.1)	1,225 (14.7)	1,311 (15.0)	1,290 (15.3)	1,482 (14.9)	1,520 (14.5)	
70-74	1,543 (17.6)	1,395 (16.8)	1,542 (17.6)	1,415 (16.7)	1,628 (16.4)	1,723 (16.4)	
75-79	1,590 (18.2)	1,453 (17.5)	1,540 (17.6)	1,392 (16.5)	1,612 (16.3)	1,763 (16.8)	
80+	2,023 (23.1)	2,047 (24.6)	2,140 (24.5)	2,202 (26.1)	2,463 (24.8)	2,610 (24.9)	

TABLE B.3: ED visits and distinct individuals by sex for each fiscal year and all years combined.

	99/00	00/01	01/02	02/03	03/04	04/05	All
ED Visits							
n	13,602	13,386	14,116	12,891	15,225	16,110	85,330
F	6,168 (45.3)	6,261 (46.8)	6,599 (46.7)	6,027 (46.8)	7,361 (48.3)	7,544 (46.8)	39,960 (46.8)
M	7,434 (54.7)	7,125 (53.2)	7,517 (53.3)	6,864 (53.2)	7,864 (51.7)	8,566 (53.2)	45,370 (53.2)
Distinct Individuals							
n	8,750	8,323	8,748	8,448	9,916	10,485	38,638
F	4,151 (47.4)	4,065 (48.8)	4,226 (48.3)	4,127 (48.9)	5,057 (51.0)	5,156 (49.2)	19,221 (49.7)
M	4,599 (52.6)	4,258 (51.2)	4,522 (51.7)	4,321 (51.1)	4,859 (49.0)	5,329 (50.8)	19,417 (50.3)

TABLE B.4: ED visits and distinct individuals by pSES (age 55–64) for each fiscal year and all years combined.

	99/00	00/01	01/02	02/03	03/04	04/05	All
ED Visits							
n	3,306	3,283	3,458	2,986	3,961	4,044	21,038
A	221 (6.7)	262 (8.0)	333 (9.6)	257 (8.6)	347 (8.8)	311 (7.7)	1,731 (8.2)
R	1,823 (55.1)	1,718 (52.3)	1,852 (53.6)	1,669 (55.9)	2,211 (55.8)	2,025 (50.1)	11,298 (53.7)
S	804 (24.3)	745 (22.7)	646 (18.7)	535 (17.9)	648 (16.4)	975 (24.1)	4,353 (20.7)
W	458 (13.9)	558 (17.0)	627 (18.1)	525 (17.6)	755 (19.1)	733 (18.1)	3,656 (17.4)
Distinct Individuals							
n	2,269	2,203	2,215	2,149	2,731	2,869	11,362
A	154 (6.8)	177 (8.0)	198 (8.9)	184 (8.6)	215 (7.9)	223 (7.8)	
R	1,318 (58.1)	1,216 (55.2)	1,249 (56.4)	1,252 (58.3)	1,642 (60.1)	1,528 (53.3)	
S	524 (23.1)	482 (21.9)	407 (18.4)	396 (18.4)	460 (16.8)	687 (23.9)	
W	273 (12.0)	328 (14.9)	361 (16.3)	317 (14.8)	414 (15.2)	431 (15.0)	

TABLE B.5: ED visits and distinct individuals by mSES for each fiscal year and all years combined.

	99/00	00/01	01/02	02/03	03/04	04/05	All
ED Visits							
n	13,602	13,386	14,116	12,891	15,225	16,110	85,330
A	561 (4.1)	661 (4.9)	715 (5.1)	652 (5.1)	771 (5.1)	756 (4.7)	4,116 (4.8)
nonA	13,041 (95.9)	12,725 (95.1)	13,401 (94.9)	12,239 (94.9)	14,454 (94.9)	15,354 (95.3)	81,214 (95.2)
Distinct Individuals							
n	8,750	8,323	8,748	8,448	9,916	10,485	38,638
A	336 (3.8)	411 (4.9)	403 (4.6)	391 (4.6)	464 (4.7)	502 (4.8)	
nonA	8,414 (96.2)	7,912 (95.1)	8,345 (95.4)	8,057 (95.4)	9,452 (95.3)	9,983 (95.2)	

TABLE B.6: ED visits and distinct individuals by sex and age group for each year and all years combined.

	99/00	00/01	01/02	02/03	03/04	04/05	All
ED Visits							
F n	6,168	6,261	6,599	6,027	7,361	7,544	39,960
55-59	801 (13.0)	825 (13.2)	818 (12.4)	731 (12.1)	1,090 (14.8)	1,056 (14.0)	5,321 (13.3)
60-64	829 (13.4)	839 (13.4)	925 (14.0)	785 (13.0)	1,026 (13.9)	1,047 (13.9)	5,451 (13.6)
65-69	925 (15.0)	988 (15.8)	1,079 (16.4)	971 (16.1)	1,126 (15.3)	1,117 (14.8)	6,206 (15.5)
70-74	1,022 (16.6)	1,086 (17.3)	1,168 (17.7)	1,029 (17.1)	1,246 (16.9)	1,298 (17.2)	6,849 (17.1)
75-79	1,244 (20.2)	1,025 (16.4)	1,089 (16.5)	935 (15.5)	1,122 (15.2)	1,190 (15.8)	6,605 (16.5)
80+	1,347 (21.8)	1,498 (23.9)	1,520 (23.0)	1,576 (26.1)	1,751 (23.8)	1,836 (24.3)	9,528 (23.8)
M n	7,434	7,125	7,517	6,864	7,864	8,566	45,370
55-59	736 (9.9)	749 (10.5)	808 (10.7)	639 (9.3)	896 (11.4)	954 (11.1)	4,782 (10.5)
60-64	940 (12.6)	870 (12.2)	907 (12.1)	831 (12.1)	949 (12.1)	987 (11.5)	5,484 (12.1)
65-69	1,227 (16.5)	1,183 (16.6)	1,238 (16.5)	1,095 (16.0)	1,292 (16.4)	1,318 (15.4)	7,353 (16.2)
70-74	1,519 (20.4)	1,253 (17.6)	1,480 (19.7)	1,267 (18.5)	1,392 (17.7)	1,550 (18.1)	8,461 (18.6)
75-79	1,416 (19.0)	1,397 (19.6)	1,369 (18.2)	1,336 (19.5)	1,461 (18.6)	1,698 (19.8)	8,677 (19.1)
80+	1,596 (21.5)	1,673 (23.5)	1,715 (22.8)	1,696 (24.7)	1,874 (23.8)	2,059 (24.0)	10,613 (23.4)
Distinct Individuals							
F n	4,151	4,065	4,226	4,127	5,057	5,156	19,221
55-59	586 (14.1)	573 (14.1)	541 (12.8)	571 (13.8)	767 (15.2)	751 (14.6)	
60-64	545 (13.1)	543 (13.4)	560 (13.3)	545 (13.2)	713 (14.1)	736 (14.3)	
65-69	593 (14.3)	554 (13.6)	627 (14.8)	612 (14.8)	731 (14.5)	750 (14.5)	
70-74	668 (16.1)	655 (16.1)	719 (17.0)	659 (16.0)	801 (15.8)	801 (15.5)	
75-79	758 (18.3)	682 (16.8)	711 (16.8)	622 (15.1)	760 (15.0)	788 (15.3)	
80+	1,001 (24.1)	1,058 (26.0)	1,068 (25.3)	1,118 (27.1)	1,285 (25.4)	1,330 (25.8)	
M n	4,599	4,258	4,522	4,321	4,859	5,329	19,417
55-59	534 (11.6)	523 (12.3)	511 (11.3)	457 (10.6)	618 (12.7)	734 (13.8)	
60-64	604 (13.1)	564 (13.2)	603 (13.3)	576 (13.3)	633 (13.0)	648 (12.2)	
65-69	732 (15.9)	671 (15.8)	684 (15.1)	678 (15.7)	751 (15.5)	770 (14.4)	
70-74	875 (19.0)	740 (17.4)	823 (18.2)	756 (17.5)	827 (17.0)	922 (17.3)	
75-79	832 (18.1)	771 (18.1)	829 (18.3)	770 (17.8)	852 (17.5)	975 (18.3)	
80+	1,022 (22.2)	989 (23.2)	1,072 (23.7)	1,084 (25.1)	1,178 (24.2)	1,280 (24.0)	

TABLE B.7: Age group and sex specific ED visit rates per 1,000 population.

	99/00	00/01	01/02	02/03	03/04	04/05
F 55-59	12.5	12.3	11.2	9.3	13.2	12.1
60-64	16.1	15.9	16.8	13.6	17.0	16.7
65-69	19.9	21.0	22.8	20.1	22.9	22.3
70-74	25.0	25.9	27.2	23.6	28.4	29.3
75-79	36.3	29.3	31.0	26.1	30.8	31.9
80+	30.2	32.0	30.8	30.6	32.8	33.1
M 55-59	11.2	11.0	10.9	8.0	10.6	10.7
60-64	18.3	16.5	16.5	14.4	15.7	15.6
65-69	26.9	25.7	26.8	23.4	27.3	27.2
70-74	41.3	32.9	37.6	31.6	34.2	37.7
75-79	55.6	53.0	50.4	47.2	49.5	55.0
80+	65.8	65.3	63.0	59.3	62.9	66.0

TABLE B.8: Age group and sex specific by pSES ED visit rates per 1,000 population.

	99/00	00/01	01/02	02/03	03/04	04/05
A F 55-59	47.2	61.9	65.9	48.4	74.3	63.9
60-64	60.2	66.3	98.9	55.0	90.6	59.0
M 55-59	31.9	40.8	52.9	46.9	43.6	49.3
60-64	75.8	68.3	62.8	48.3	47.7	38.5
R F 55-59	8.6	8.4	7.6	6.9	8.9	8.4
60-64	10.8	8.8	10.9	9.2	10.5	9.9
M 55-59	8.5	8.0	7.9	5.8	8.1	7.9
60-64	13.6	11.6	10.6	9.3	10.8	10.0
S F 55-59	20.9	17.4	14.4	10.7	16.4	13.3
60-64	21.3	22.7	18.3	15.7	23.3	18.2
M 55-59	15.9	15.7	14.8	10.7	10.9	14.9
60-64	27.5	23.4	27.6	26.3	21.0	27.8
W F 55-59	36.9	42.9	44.6	33.2	58.9	51.7
60-64	45.4	62.3	66.2	56.2	60.2	61.6
M 55-59	49.2	49.9	50.3	33.8	50.8	47.3
60-64	47.9	60.2	75.5	66.0	84.2	76.6

TABLE B.9: Gender and age group directly standardized visit rates per 1,000 population by fiscal year.

	99/00	00/01	01/02	02/03	03/04	04/05
DSVR	25.6 (0.4)	24.4 (0.4)	24.8 (0.4)	21.8 (0.3)	25.0 (0.4)	25.6 (0.4)
95% CI	24.8 to 26.4	23.6 to 25.2	24.0 to 25.6	21.2 to 22.5	24.3 to 25.7	24.8 to 26.3

TABLE B.10: ED visits and distinct individuals by sex and pSES (age 55–64) for each fiscal year and all years combined.

		99/00	00/01	01/02	02/03	03/04	04/05	All
ED Visits								
F	n	1,630	1,664	1,743	1,516	2,116	2,103	10,772
	A	112 (6.9)	145 (8.7)	197 (11.3)	136 (9.0)	227 (10.7)	187 (8.9)	1,004 (9.3)
	R	795 (48.8)	758 (45.6)	867 (49.7)	818 (54.0)	1,065 (50.3)	896 (42.6)	5,199 (48.3)
	S	512 (31.4)	490 (29.4)	382 (21.9)	310 (20.4)	460 (21.7)	659 (31.3)	2,813 (26.1)
	W	211 (12.9)	271 (16.3)	297 (17.0)	252 (16.6)	364 (17.2)	361 (17.2)	1,756 (16.3)
M	n	1,676	1,619	1,715	1,470	1,845	1,941	10,266
	A	109 (6.5)	117 (7.2)	136 (7.9)	121 (8.2)	120 (6.5)	124 (6.4)	727 (7.1)
	R	1,028 (61.3)	960 (59.3)	985 (57.4)	851 (57.9)	1,146 (62.1)	1,129 (58.2)	6,099 (59.4)
	S	292 (17.4)	255 (15.8)	264 (15.4)	225 (15.3)	188 (10.2)	316 (16.3)	1,540 (15.0)
	W	247 (14.7)	287 (17.7)	330 (19.2)	273 (18.6)	391 (21.2)	372 (19.2)	1,900 (18.5)
Distinct Individuals								
F	n	1,131	1,116	1,101	1,116	1,480	1,487	5,826
	A	84 (7.4)	88 (7.9)	116 (10.5)	95 (8.5)	133 (9.0)	127 (8.5)	
	R	583 (51.5)	553 (49.6)	572 (52.0)	613 (54.9)	802 (54.2)	667 (44.9)	
	S	327 (28.9)	310 (27.8)	249 (22.6)	239 (21.4)	324 (21.9)	477 (32.1)	
	W	137 (12.1)	165 (14.8)	164 (14.9)	169 (15.1)	221 (14.9)	216 (14.5)	
M	n	1,138	1,087	1,114	1,033	1,251	1,382	5,536
	A	70 (6.2)	89 (8.2)	82 (7.4)	89 (8.6)	82 (6.6)	96 (6.9)	
	R	735 (64.6)	663 (61.0)	677 (60.8)	639 (61.9)	840 (67.1)	861 (62.3)	
	S	197 (17.3)	172 (15.8)	158 (14.2)	157 (15.2)	136 (10.9)	210 (15.2)	
	W	136 (12.0)	163 (15.0)	197 (17.7)	148 (14.3)	193 (15.4)	215 (15.6)	

FIGURE B.2: ED visits and distinct individuals by sex and pSES (age 55–64), 2004/2005.

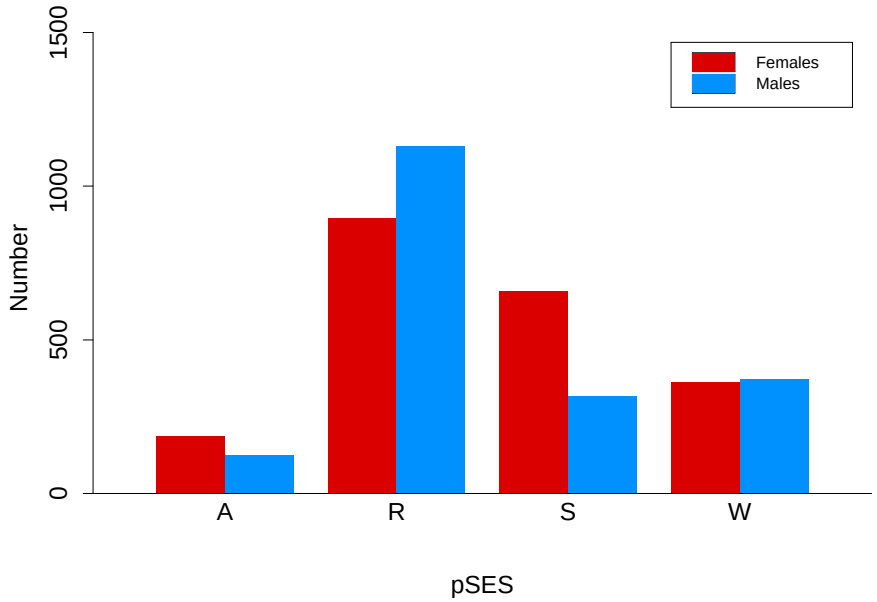


TABLE B.11: ED visits by sex and mSES for each fiscal year and all years combined.

		99/00	00/01	01/02	02/03	03/04	04/05	All
ED Visits								
F	n	6,168	6,261	6,599	6,027	7,361	7,544	39,960
	A	316 (5.1)	382 (6.1)	404 (6.1)	370 (6.1)	473 (6.4)	404 (5.4)	2,349 (5.9)
	nonA	5,852 (94.9)	5,879 (93.9)	6,195 (93.9)	5,657 (93.9)	6,888 (93.6)	7,140 (94.6)	37,611 (94.1)
M	n	7,434	7,125	7,517	6,864	7,864	8,566	45,370
	A	245 (3.3)	279 (3.9)	311 (4.1)	282 (4.1)	298 (3.8)	352 (4.1)	1,767 (3.9)
	nonA	7,189 (96.7)	6,846 (96.1)	7,206 (95.9)	6,582 (95.9)	7,566 (96.2)	8,214 (95.9)	43,603 (96.1)
Distinct Individuals								
F	n	4,151	4,065	4,226	4,127	5,057	5,156	19,221
	A	185 (4.5)	222 (5.5)	228 (5.4)	205 (5.0)	275 (5.4)	272 (5.3)	
	nonA	3,966 (95.5)	3,843 (94.5)	3,998 (94.6)	3,922 (95.0)	4,782 (94.6)	4,884 (94.7)	
M	n	4,599	4,258	4,522	4,321	4,859	5,329	19,417
	A	151 (3.3)	189 (4.4)	175 (3.9)	186 (4.3)	189 (3.9)	230 (4.3)	
	nonA	4,448 (96.7)	4,069 (95.6)	4,347 (96.1)	4,135 (95.7)	4,670 (96.1)	5,099 (95.7)	

TABLE B.12: Sex and age group (age 55–64) directly standardized visit rates per 1,000 population by pSES for each fiscal year.

		99/00	00/01	01/02	02/03	03/04	04/05
A	DSVR	52.1 (5.6)	58.4 (5.9)	68.9 (7.8)	49.4 (4.6)	63.4 (6.5)	53.1 (4.6)
	95% CI	41.2 to 63.0	46.8 to 69.9	53.6 to 84.1	40.4 to 58.5	50.7 to 76.1	44.0 to 62.1
R	DSVR	10.2 (0.5)	9.1 (0.4)	9.1 (0.5)	7.6 (0.3)	9.5 (0.3)	8.9 (0.3)
	95% CI	9.2 to 11.1	8.3 to 9.9	8.1 to 10.1	7.1 to 8.2	8.8 to 10.1	8.3 to 9.6
S	DSVR	21.0 (1.4)	19.4 (1.3)	18.3 (1.5)	15.3 (1.0)	17.4 (1.0)	18.1 (1.3)
	95% CI	18.2 to 23.8	16.9 to 22.0	15.4 to 21.2	13.3 to 17.2	15.3 to 19.4	15.5 to 20.6
W	DSVR	44.7 (3.7)	53.0 (4.0)	57.8 (4.5)	45.7 (3.3)	62.5 (4.8)	58.2 (3.9)
	95% CI	37.4 to 51.9	45.2 to 60.8	49.1 to 66.6	39.3 to 52.2	53.1 to 71.9	50.4 to 65.9

C Timing of ED Visits

TABLE C.1: ED visits by month of year for each fiscal year and all years combined.

	99/00		00/01		01/02		02/03		03/04		04/05		All	
ED Visits														
n	13,602		13,386		14,116		12,891		15,225		16,110		85,330	
Apr	1,046	(7.7)	1,112	(8.3)	1,366	(9.7)	1,276	(9.9)	1,221	(8.0)	1,469	(9.1)	7,490	(8.8)
May	1,007	(7.4)	1,153	(8.6)	1,206	(8.5)	1,229	(9.5)	1,270	(8.3)	1,326	(8.2)	7,191	(8.4)
Jun	994	(7.3)	1,018	(7.6)	1,072	(7.6)	901	(7.0)	1,090	(7.2)	1,134	(7.0)	6,209	(7.3)
Jul	908	(6.7)	1,013	(7.6)	1,123	(8.0)	857	(6.6)	1,072	(7.0)	1,085	(6.7)	6,058	(7.1)
Aug	863	(6.3)	924	(6.9)	911	(6.5)	931	(7.2)	1,025	(6.7)	1,047	(6.5)	5,701	(6.7)
Sep	862	(6.3)	1,032	(7.7)	942	(6.7)	1,014	(7.9)	1,112	(7.3)	1,225	(7.6)	6,187	(7.3)
Oct	996	(7.3)	1,025	(7.7)	1,122	(7.9)	1,066	(8.3)	1,369	(9.0)	1,216	(7.5)	6,794	(8.0)
Nov	1,223	(9.0)	974	(7.3)	1,041	(7.4)	942	(7.3)	1,480	(9.7)	1,096	(6.8)	6,756	(7.9)
Dec	2,192	(16.1)	1,385	(10.3)	1,249	(8.8)	1,235	(9.6)	1,394	(9.2)	1,502	(9.3)	8,957	(10.5)
Jan	1,369	(10.1)	1,503	(11.2)	1,446	(10.2)	1,128	(8.8)	1,420	(9.3)	1,669	(10.4)	8,535	(10.0)
Feb	998	(7.3)	1,012	(7.6)	1,111	(7.9)	946	(7.3)	1,278	(8.4)	1,474	(9.1)	6,819	(8.0)
Mar	1,144	(8.4)	1,235	(9.2)	1,527	(10.8)	1,366	(10.6)	1,494	(9.8)	1,867	(11.6)	8,633	(10.1)
Individuals														
Apr	862	(7.6)	912	(8.2)	1,107	(9.6)	1,102	(9.9)	1,071	(8.2)	1,261	(9.1)	5,759	(8.7)
May	861	(7.5)	924	(8.3)	1,015	(8.8)	1,037	(9.3)	1,102	(8.5)	1,114	(8.1)	5,503	(8.4)
Jun	778	(6.8)	853	(7.7)	883	(7.6)	796	(7.2)	893	(6.9)	966	(7.0)	4,729	(7.2)
Jul	750	(6.6)	854	(7.7)	904	(7.8)	744	(6.7)	920	(7.1)	903	(6.5)	4,651	(7.1)
Aug	748	(6.6)	767	(6.9)	732	(6.3)	824	(7.4)	853	(6.6)	894	(6.5)	4,383	(6.7)
Sep	724	(6.3)	859	(7.7)	797	(6.9)	876	(7.9)	908	(7.0)	1,071	(7.8)	4,784	(7.3)
Oct	884	(7.7)	833	(7.5)	927	(8.0)	864	(7.8)	1,186	(9.1)	1,060	(7.7)	5,254	(8.0)
Nov	1,043	(9.1)	810	(7.3)	823	(7.1)	824	(7.4)	1,291	(9.9)	920	(6.7)	5,263	(8.0)
Dec	1,844	(16.2)	1,199	(10.8)	1,039	(9.0)	1,083	(9.7)	1,222	(9.4)	1,304	(9.4)	7,058	(10.7)
Jan	1,108	(9.7)	1,212	(10.9)	1,160	(10.0)	987	(8.9)	1,184	(9.1)	1,415	(10.2)	6,451	(9.8)
Feb	875	(7.7)	874	(7.9)	908	(7.9)	817	(7.3)	1,086	(8.4)	1,282	(9.3)	5,392	(8.2)
Mar	933	(8.2)	1,022	(9.2)	1,266	(11.0)	1,170	(10.5)	1,286	(9.9)	1,629	(11.8)	6,627	(10.1)

FIGURE C.1: ED visits per month during the study period.

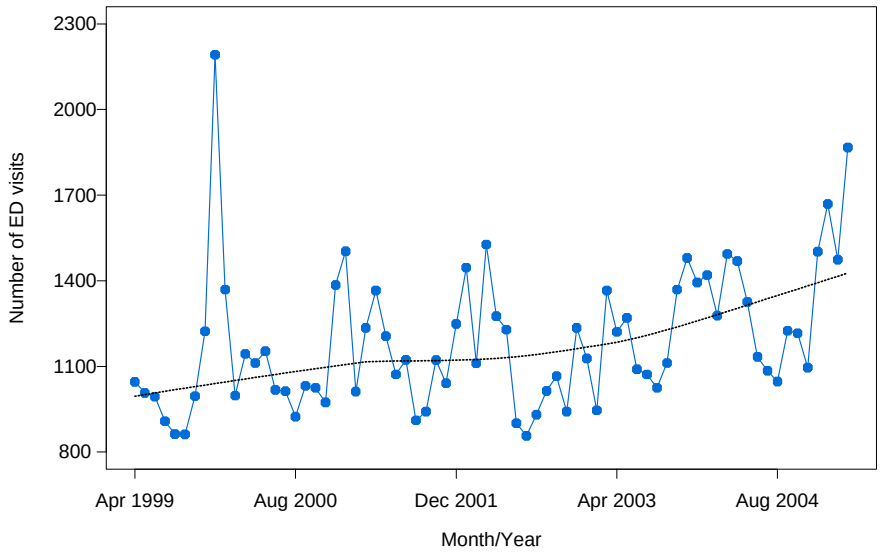


FIGURE C.2: ED visits per month for each fiscal year.

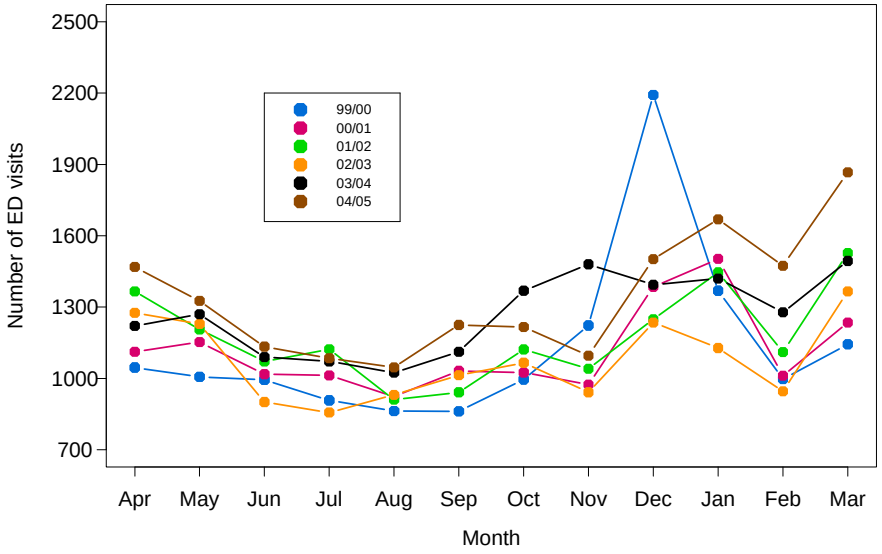


TABLE C.2: ED visits by day of week for each fiscal year and all years combined.

	99/00	00/01	01/02	02/03	03/04	04/05	All
ED Visits							
n	13,602	13,386	14,116	12,891	15,225	16,110	85,330
Sun	1,987 (14.6)	1,860 (13.9)	2,003 (14.2)	1,779 (13.8)	2,080 (13.7)	2,209 (13.7)	11,918 (14.0)
Mon	2,126 (15.6)	2,051 (15.3)	2,152 (15.2)	1,991 (15.4)	2,326 (15.3)	2,506 (15.6)	13,152 (15.4)
Tue	1,932 (14.2)	2,006 (15.0)	1,950 (13.8)	1,846 (14.3)	2,204 (14.5)	2,259 (14.0)	12,197 (14.3)
Wed	1,792 (13.2)	1,798 (13.4)	2,013 (14.3)	1,770 (13.7)	2,181 (14.3)	2,201 (13.7)	11,755 (13.8)
Thu	1,805 (13.3)	1,799 (13.4)	1,982 (14.0)	1,734 (13.5)	2,026 (13.3)	2,230 (13.8)	11,576 (13.6)
Fri	1,916 (14.1)	1,926 (14.4)	2,064 (14.6)	1,922 (14.9)	2,201 (14.5)	2,351 (14.6)	12,380 (14.5)
Sat	2,044 (15.0)	1,946 (14.5)	1,952 (13.8)	1,849 (14.3)	2,207 (14.5)	2,354 (14.6)	12,352 (14.5)
Individuals							
Sun	1,773 (14.9)	1,627 (14.1)	1,731 (14.3)	1,596 (14.0)	1,854 (13.7)	1,952 (13.8)	9,262 (14.3)
Mon	1,880 (15.8)	1,772 (15.3)	1,855 (15.3)	1,738 (15.3)	2,049 (15.2)	2,200 (15.5)	9,945 (15.3)
Tue	1,658 (13.9)	1,695 (14.7)	1,659 (13.7)	1,615 (14.2)	1,920 (14.2)	1,970 (13.9)	9,085 (14.0)
Wed	1,529 (12.8)	1,535 (13.3)	1,705 (14.1)	1,535 (13.5)	1,920 (14.2)	1,935 (13.7)	8,728 (13.5)
Thu	1,585 (13.3)	1,557 (13.5)	1,711 (14.1)	1,509 (13.2)	1,806 (13.4)	1,956 (13.8)	8,826 (13.6)
Fri	1,674 (14.0)	1,662 (14.4)	1,760 (14.5)	1,726 (15.2)	1,972 (14.6)	2,058 (14.5)	9,344 (14.4)
Sat	1,830 (15.3)	1,721 (14.9)	1,697 (14.0)	1,673 (14.7)	1,979 (14.7)	2,087 (14.7)	9,646 (14.9)

FIGURE C.3: ED visits by day of week for each fiscal year.

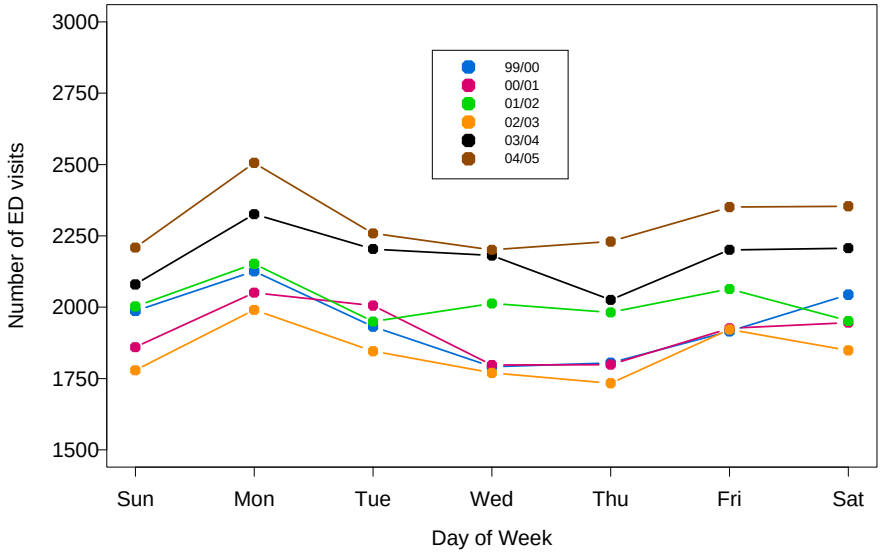


FIGURE C.4: Daily ED visits during the study period.

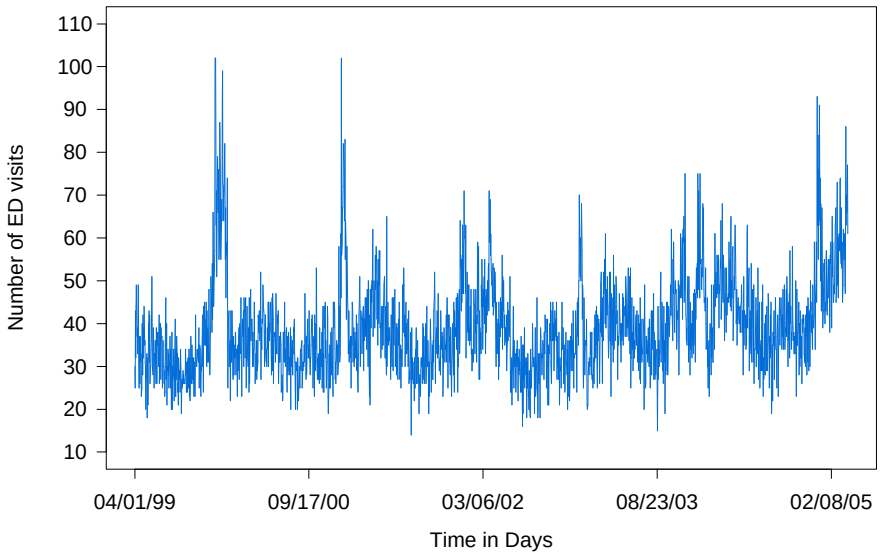


FIGURE C.5: ED visits by hour of day for each fiscal year.

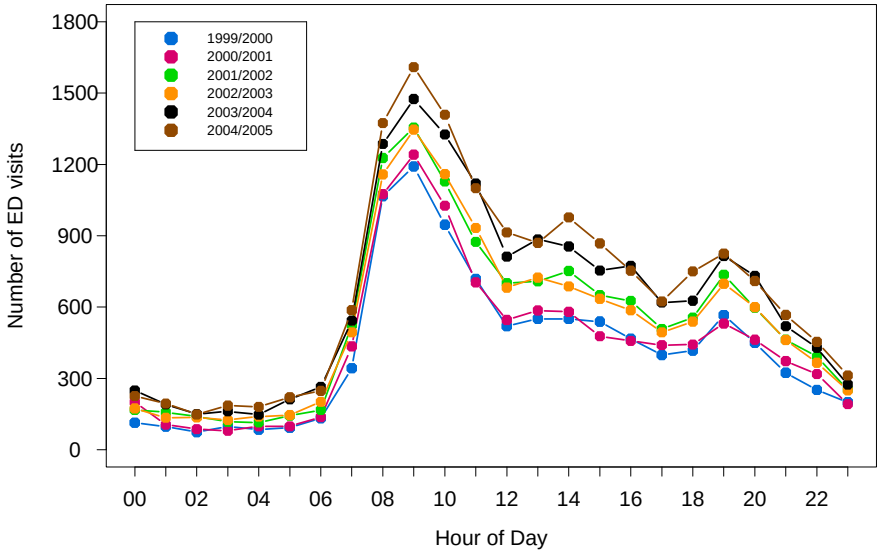


TABLE C.3: ED visits by hour of day for each fiscal year and all years combined.

	99/00	00/01	01/02	02/03	03/04	04/05	All
ED Visits							
n	13,602	13,386	14,116	12,891	15,225	16,110	85,330
00:00-00:59	114 (0.8)	201 (1.5)	168 (1.2)	174 (1.3)	249 (1.6)	226 (1.4)	1,132 (1.3)
01:00-01:59	98 (0.7)	106 (0.8)	158 (1.1)	135 (1.0)	191 (1.3)	195 (1.2)	883 (1.0)
02:00-02:59	75 (0.6)	87 (0.6)	140 (1.0)	136 (1.1)	150 (1.0)	149 (0.9)	737 (0.9)
03:00-03:59	98 (0.7)	80 (0.6)	118 (0.8)	126 (1.0)	162 (1.1)	186 (1.2)	770 (0.9)
04:00-04:59	85 (0.6)	99 (0.7)	115 (0.8)	140 (1.1)	148 (1.0)	181 (1.1)	768 (0.9)
05:00-05:59	93 (0.7)	99 (0.7)	143 (1.0)	146 (1.1)	213 (1.4)	221 (1.4)	915 (1.1)
06:00-06:59	133 (1.0)	138 (1.0)	168 (1.2)	202 (1.6)	265 (1.7)	248 (1.5)	1,154 (1.4)
07:00-07:59	343 (2.5)	435 (3.2)	525 (3.7)	494 (3.8)	543 (3.6)	587 (3.6)	2,927 (3.4)
08:00-08:59	1,066 (7.8)	1,075 (8.0)	1,227 (8.7)	1,158 (9.0)	1,286 (8.4)	1,374 (8.5)	7,186 (8.4)
09:00-09:59	1,191 (8.8)	1,241 (9.3)	1,355 (9.6)	1,346 (10.4)	1,475 (9.7)	1,609 (10.0)	8,217 (9.6)
10:00-10:59	946 (7.0)	1,026 (7.7)	1,128 (8.0)	1,159 (9.0)	1,326 (8.7)	1,409 (8.7)	6,994 (8.2)
11:00-11:59	718 (5.3)	704 (5.3)	874 (6.2)	933 (7.2)	1,120 (7.4)	1,100 (6.8)	5,449 (6.4)
12:00-12:59	520 (3.8)	546 (4.1)	701 (5.0)	682 (5.3)	812 (5.3)	914 (5.7)	4,175 (4.9)
13:00-13:59	551 (4.1)	586 (4.4)	708 (5.0)	724 (5.6)	885 (5.8)	870 (5.4)	4,324 (5.1)
14:00-14:59	550 (4.0)	580 (4.3)	752 (5.3)	687 (5.3)	855 (5.6)	977 (6.1)	4,401 (5.2)
15:00-15:59	539 (4.0)	478 (3.6)	651 (4.6)	635 (4.9)	754 (5.0)	868 (5.4)	3,925 (4.6)
16:00-16:59	467 (3.4)	458 (3.4)	626 (4.4)	587 (4.6)	773 (5.1)	753 (4.7)	3,664 (4.3)
17:00-17:59	399 (2.9)	440 (3.3)	508 (3.6)	494 (3.8)	619 (4.1)	624 (3.9)	3,084 (3.6)
18:00-18:59	417 (3.1)	443 (3.3)	556 (3.9)	539 (4.2)	627 (4.1)	750 (4.7)	3,332 (3.9)
19:00-19:59	566 (4.2)	531 (4.0)	736 (5.2)	698 (5.4)	815 (5.4)	825 (5.1)	4,171 (4.9)
20:00-20:59	450 (3.3)	463 (3.5)	597 (4.2)	600 (4.7)	731 (4.8)	710 (4.4)	3,551 (4.2)
21:00-21:59	324 (2.4)	373 (2.8)	463 (3.3)	462 (3.6)	520 (3.4)	567 (3.5)	2,709 (3.2)
22:00-22:59	252 (1.9)	319 (2.4)	392 (2.8)	366 (2.8)	429 (2.8)	454 (2.8)	2,212 (2.6)
23:00-23:59	200 (1.5)	192 (1.4)	253 (1.8)	250 (1.9)	275 (1.8)	313 (1.9)	1,483 (1.7)
Missing	3,407 (25.0)	2,686 (20.1)	1,054 (7.5)	18 (0.1)	2 (0.0)	0 (0.0)	7,167 (8.4)
Individuals							
00:00-00:59	109 (0.9)	185 (1.6)	162 (1.3)	170 (1.4)	237 (1.7)	214 (1.5)	1,036 (1.5)
01:00-01:59	96 (0.8)	98 (0.9)	150 (1.2)	132 (1.1)	184 (1.3)	190 (1.3)	818 (1.2)
02:00-02:59	73 (0.6)	85 (0.7)	133 (1.1)	133 (1.1)	148 (1.1)	145 (1.0)	692 (1.0)
03:00-03:59	93 (0.8)	78 (0.7)	113 (0.9)	125 (1.0)	157 (1.1)	174 (1.2)	713 (1.0)
04:00-04:59	84 (0.7)	96 (0.8)	114 (0.9)	133 (1.1)	142 (1.0)	178 (1.2)	723 (1.0)
05:00-05:59	89 (0.8)	96 (0.8)	134 (1.1)	143 (1.2)	203 (1.5)	207 (1.4)	826 (1.2)
06:00-06:59	126 (1.1)	132 (1.2)	155 (1.3)	190 (1.6)	238 (1.7)	240 (1.6)	1,023 (1.5)
07:00-07:59	294 (2.6)	343 (3.0)	407 (3.3)	419 (3.5)	454 (3.2)	519 (3.5)	2,235 (3.2)
08:00-08:59	847 (7.4)	824 (7.3)	973 (7.9)	968 (8.1)	1,061 (7.6)	1,124 (7.6)	4,998 (7.2)
09:00-09:59	991 (8.6)	1,031 (9.1)	1,116 (9.1)	1,184 (9.9)	1,297 (9.3)	1,411 (9.6)	6,185 (8.9)
10:00-10:59	850 (7.4)	912 (8.0)	1,011 (8.2)	1,084 (9.1)	1,215 (8.7)	1,311 (8.9)	5,807 (8.4)
11:00-11:59	674 (5.9)	655 (5.8)	791 (6.4)	892 (7.5)	1,056 (7.6)	1,041 (7.1)	4,710 (6.8)
12:00-12:59	496 (4.3)	519 (4.6)	660 (5.4)	654 (5.5)	772 (5.5)	861 (5.8)	3,698 (5.3)
13:00-13:59	502 (4.4)	533 (4.7)	656 (5.3)	679 (5.7)	851 (6.1)	806 (5.5)	3,748 (5.4)
14:00-14:59	505 (4.4)	524 (4.6)	696 (5.7)	658 (5.5)	797 (5.7)	906 (6.1)	3,791 (5.5)
15:00-15:59	494 (4.3)	452 (4.0)	600 (4.9)	597 (5.0)	716 (5.1)	812 (5.5)	3,410 (4.9)
16:00-16:59	419 (3.6)	421 (3.7)	581 (4.7)	556 (4.7)	725 (5.2)	709 (4.8)	3,218 (4.6)
17:00-17:59	374 (3.2)	397 (3.5)	467 (3.8)	475 (4.0)	585 (4.2)	593 (4.0)	2,725 (3.9)
18:00-18:59	388 (3.4)	417 (3.7)	493 (4.0)	508 (4.3)	599 (4.3)	690 (4.7)	2,923 (4.2)

Continued on next page

TABLE C.3 continued from previous page

	99/00	00/01	01/02	02/03	03/04	04/05	All
19:00-19:59	506 (4.4)	472 (4.2)	611 (5.0)	638 (5.4)	753 (5.4)	733 (5.0)	3,401 (4.9)
20:00-20:59	404 (3.5)	413 (3.6)	528 (4.3)	553 (4.6)	673 (4.8)	643 (4.4)	2,976 (4.3)
21:00-21:59	293 (2.5)	328 (2.9)	420 (3.4)	421 (3.5)	461 (3.3)	516 (3.5)	2,266 (3.3)
22:00-22:59	239 (2.1)	290 (2.6)	342 (2.8)	350 (2.9)	389 (2.8)	414 (2.8)	1,903 (2.7)
23:00-23:59	188 (1.6)	182 (1.6)	228 (1.9)	235 (2.0)	264 (1.9)	301 (2.0)	1,303 (1.9)
Missing	2,382 (20.7)	1,867 (16.4)	758 (6.2)	18 (0.2)	2 (0.0)	0 (0.0)	4,342 (6.3)

D ED Visit Disposition

TABLE D.1: ED visits by disposition for each fiscal year and all years combined. The "–" denotes small counts.

	99/00	00/01	01/02	02/03	03/04	04/05	All
ED Visits							
n	13,602	13,386	14,116	12,891	15,225	16,110	85,330
1	8,840 (65.0)	9,036 (67.5)	9,649 (68.4)	8,633 (67.0)	10,271 (67.5)	10,791 (67.0)	57,220 (67.1)
2	41 (0.3)	24 (0.2)	45 (0.3)	24 (0.2)	19 (0.1)	2 (0.0)	155 (0.2)
3	15 (0.1)	16 (0.1)	27 (0.2)	17 (0.1)	27 (0.2)	37 (0.2)	139 (0.2)
4	154 (1.1)	171 (1.3)	140 (1.0)	161 (1.2)	178 (1.2)	167 (1.0)	971 (1.1)
5	4,377 (32.2)	3,972 (29.7)	4,054 (28.7)	3,841 (29.8)	4,527 (29.7)	4,886 (30.3)	25,657 (30.1)
6	163 (1.2)	152 (1.1)	182 (1.3)	190 (1.5)	191 (1.3)	199 (1.2)	1,077 (1.3)
7	9 (0.1)	9 (0.1)	14 (0.1)	18 (0.1)	9 (0.1)	22 (0.1)	81 (0.1)
8	–	–	–	–	–	–	25 (0.0)
9	–	–	–	–	–	–	5 (0.0)
Individuals							
1	6,086 (62.2)	5,992 (64.0)	6,351 (64.9)	6,126 (64.9)	7,241 (65.2)	7,572 (64.5)	30,004 (64.4)
2	29 (0.3)	20 (0.2)	36 (0.4)	9 (0.1)	5 (0.0)	2 (0.0)	97 (0.2)
3	14 (0.1)	16 (0.2)	27 (0.3)	17 (0.2)	26 (0.2)	36 (0.3)	132 (0.3)
4	152 (1.6)	166 (1.8)	137 (1.4)	158 (1.7)	165 (1.5)	157 (1.3)	884 (1.9)
5	3,332 (34.1)	3,003 (32.1)	3,039 (31.1)	2,929 (31.0)	3,472 (31.3)	3,742 (31.9)	14,383 (30.9)
6	158 (1.6)	147 (1.6)	177 (1.8)	182 (1.9)	179 (1.6)	195 (1.7)	982 (2.1)
7	9 (0.1)	9 (0.1)	14 (0.1)	18 (0.2)	9 (0.1)	22 (0.2)	81 (0.2)
8	–	–	–	–	–	–	25 (0.1)
9	–	–	–	–	–	–	5 (0.0)

TABLE D.2: ED visits by pSES (age 55–64) and disposition for each year and all years combined. The "–" denotes small counts.

		99/00	00/01	01/02	02/03	03/04	04/05	All
ED Visits								
A	n	221	262	333	257	347	311	1,731
	1, 2	181 (81.9)	223 (85.1)	291 (87.4)	216 (84.0)	298 (85.9)	253 (81.4)	1,462 (84.5)
	3, 9	–	–	–	–	–	–	–
	4, 5, 6	40 (18.1)	38 (14.5)	40 (12.0)	40 (15.6)	48 (13.8)	54 (17.4)	260 (15.0)
	7, 8	–	–	–	–	–	–	–
R	n	1,823	1,718	1,852	1,669	2,211	2,025	11,298
	1, 2	1,531 (84.0)	1,444 (84.1)	1,578 (85.2)	1,437 (86.1)	1,846 (83.5)	1,723 (85.1)	9,559 (84.6)
	3, 9	–	–	–	–	–	–	–
	4, 5, 6	291 (16.0)	273 (15.9)	266 (14.4)	229 (13.7)	360 (16.3)	290 (14.3)	1,709 (15.1)
	7, 8	–	–	–	–	–	–	–
S	n	804	745	646	535	648	975	4,353
	1, 2	617 (76.7)	604 (81.1)	517 (80.0)	402 (75.1)	486 (75.0)	747 (76.6)	3,373 (77.5)
	3, 9	–	–	–	–	–	–	–
	4, 5, 6	186 (23.1)	139 (18.7)	127 (19.6)	132 (24.7)	159 (24.5)	224 (23.0)	967 (22.2)
	7, 8	–	–	–	–	–	–	–
W	n	458	558	627	525	755	733	3,656
	1, 2	305 (66.6)	377 (67.6)	417 (66.5)	366 (69.7)	516 (68.3)	467 (63.7)	2,448 (67.0)
	3, 9	–	–	–	–	–	–	–
	4, 5, 6	149 (32.5)	178 (31.9)	206 (32.9)	154 (29.3)	232 (30.7)	261 (35.6)	1,180 (32.3)
	7, 8	–	–	–	–	–	–	–

TABLE D.3: Individuals by pSES (age 55–64) and disposition for each year and all years combined. The "–" denotes small counts.

		99/00	00/01	01/02	02/03	03/04	04/05	All
Individuals								
A	1, 2	135 (82.8)	161 (86.1)	182 (87.1)	159 (82.8)	195 (83.7)	197 (84.5)	763 (83.8)
	3, 9	–	–	–	–	–	–	–
	4, 5, 6	28 (17.2)	25 (13.4)	25 (12.0)	32 (16.7)	37 (15.9)	33 (14.2)	139 (15.3)
	7, 8	–	–	–	–	–	–	–
R	1, 2	1,131 (82.0)	1,058 (83.2)	1,093 (83.1)	1,104 (85.2)	1,430 (83.3)	1,350 (84.9)	6,193 (84.1)
	3, 9	–	–	–	–	–	–	–
	4, 5, 6	247 (17.9)	212 (16.7)	215 (16.3)	189 (14.6)	281 (16.4)	228 (14.3)	1,143 (15.5)
	7, 8	–	–	–	–	–	–	–
S	1, 2	425 (75.6)	408 (78.6)	341 (78.0)	324 (76.8)	376 (75.8)	568 (77.6)	2,110 (77.8)
	3, 9	–	–	–	–	–	–	–
	4, 5, 6	136 (24.2)	109 (21.0)	94 (21.5)	97 (23.0)	117 (23.6)	160 (21.9)	588 (21.7)
	7, 8	–	–	–	–	–	–	–
W	1, 2	193 (63.5)	242 (65.4)	274 (67.3)	245 (67.9)	311 (66.7)	307 (63.2)	1,224 (66.8)
	3, 9	–	–	–	–	–	–	–
	4, 5, 6	108 (35.5)	125 (33.8)	129 (31.7)	111 (30.7)	149 (32.0)	174 (35.8)	583 (31.8)
	7, 8	–	–	–	–	–	–	–

TABLE D.4: First diagnosis reported for ED visits resulting in admission, all years.

Diagnosis Categories	**Count (%)**
n	27,705
COPD and COPD-related	20,848 (75.2)
Exacerbation	5,495 (19.8)
Chronic airway obstruction	6,419 (23.2)
Bronchitis	6,898 (24.9)
Respiratory failure	660 (2.4)
Emphysema	452 (1.6)
Bronchiectasis	192 (0.7)
Other	732 (2.6)
Lung Infection	2,916 (10.5)
Lower respiratory tract infection (not pneumonia)	1,345 (4.85)
Pneumonia	1,571 (5.7)
Cardiac disease	2,311 (8.3)
Congestive heart failure	1,514 (5.5)
Ischemic heart disease	288 (1.0)
Atrial fibrillation and flutter	172 (0.6)
Chest pain and non-specific chest pain	156 (0.6)
Other	181 (0.7)
Gastro-intestinal	348 (1.3)
Neurological	216 (0.8)
TIA/stroke	77 (0.3)
Other	139 (0.5)
Cancers	118 (0.4)
Endocrine, nutritional and metabolic	142 (0.5)
Fluid, electrolyte and acid-balance disorder	86 (0.3)
Diabetes	56 (0.2)
Genito-urinary	101 (0.4)
Psychiatric	85 (0.3)
Musculo-skeletal and connective tissue	74 (0.3)
Thrombosis, hemostasis and blood	72 (0.3)
Fractures	115 (0.4)
Skin and subcutaneous tissue	68 (0.2)
Poisoning	12 (0.0)
Other	279 (1.0)

E Regional Variation

TABLE E.1: Regional Health Authority (RHA) and sub-Regional Health Authority (sRHA) codes and names.

RHA		Code	sRHA
R1	Chinook Regional Health Authority	1	R101 Crowsnest Pincher Creek
		2	R102 Ft McLeod Cardston
		3	R103 Lethbridge
		4	R104 Picture Butte Raymond Milk R
		5	R105 Vauxhall Taber
R2	Palliser Health Region	6	R201 Palliser North and Central
		7	R202 Palliser West
R3	Calgary Health Region	8	R301 Calgary North East
		9	R302 Calgary Beddington Heights
		10	R303 Calgary Northwest
		11	R304 Calgary University
		12	R305 Calgary Charleswood
		13	R306 Calgary Marlborough
		14	R307 Calgary Shaganappi
		15	R308 Calgary Bowness
		16	R309 Calgary Scarboro
		17	R310 Calgary Forest Lawn
		18	R311 Calgary Lakeview
		19	R312 Calgary Mount Royal
		20	R313 Calgary Haysboro
		21	R314 Calgary Bonavista
		22	R315 Calgary South
		23	R320 Banff-Canmore
		24	R321 Didsbury-Strathmore
		25	R322 Vulcan-Claresholm
		26	R323 High River-Black Diamond
R4	David Thompson Regional Health Authority	27	R401 Clearwater
		28	R402 Brazeau
		29	R403 Wetaskiwin-Hobbema
		30	R404 Ponoka
		31	R405 Lacombe
		32	R406 Red Deer
		33	R407 Olds
		34	R408 Drumheller-Hanna
		35	R409 Stettler-Consort

Continued on next page

TABLE E.1 continued from previous page

RHA	Code	sRHA
R5 East Central Health	36	R501 Region 5 Northwest
	37	R502 Regions 5 Northeast
	38	R503 Region 5 Southeast
	39	R504 Region 5 South Central
	40	R505 Region5 Southwest
R6 Capital Health	41	R601 St. Albert
	42	R602 Edmonton Castle Downs
	43	R603 Edmonton Woodcroft
	44	R604 Edmonton Eastwood
	45	R605 Edmonton North Central
	46	R606 Edmonton North East
	47	R607 Edmonton Bonnie Doon
	48	R608 Edmonton West Jasper Place
	49	R609 Edmonton Twin Brooks
	50	R612 Edmonton Mill Woods
	51	R613 Sherwood Park
	52	R614 Strathcona County
	53	R615 Thorsby
	54	R616 Leduc Office
	55	R617 Beaumont
	56	R618 Westview
	57	R619 Sturgeon County
	58	R620 Fort Saskatchewan
R7 Aspen Regional Health Authority	59	R701 Aspen West
	60	R702 Aspen Central
	61	R703 Aspen North
	62	R704 Aspen East
R8 Peace Country Health	63	R801 Peace NW
	64	R802 Peace NE
	65	R803 Peace SE
	66	R804 Peace SW
R9 Northern Lights Health Region	67	R901 High Level
	68	R902 La Crete
	69	R903 Northern Lights Northwest
	70	R904 Fort McMurray

TABLE E.2: Population by RHA and sRHA for each fiscal year.

		99/00	00/01	01/02	02/03	03/04	04/05
R1	n	32,042	32,673	33,571	34,587	35,320	36,336
	R101	3,811 (11.9)	3,908 (12.0)	3,955 (11.8)	4,068 (11.8)	4,121 (11.7)	4,240 (11.7)
	R102	4,447 (13.9)	4,531 (13.9)	4,589 (13.7)	4,719 (13.6)	4,807 (13.6)	4,873 (13.4)
	R103	16,151 (50.4)	16,496 (50.5)	17,104 (50.9)	17,684 (51.1)	18,105 (51.3)	18,730 (51.5)
	R104	4,819 (15.0)	4,894 (15.0)	5,029 (15.0)	5,163 (14.9)	5,303 (15.0)	5,443 (15.0)
	R105	2,814 (8.8)	2,844 (8.7)	2,894 (8.6)	2,953 (8.5)	2,984 (8.4)	3,050 (8.4)
R2	n	19,373	19,829	20,387	20,924	21,499	22,024
	R201	16,079 (83.0)	16,428 (82.8)	16,874 (82.8)	17,337 (82.9)	17,745 (82.5)	18,162 (82.5)
	R202	3,294 (17.0)	3,401 (17.2)	3,513 (17.2)	3,587 (17.1)	3,754 (17.5)	3,862 (17.5)
R3	n	172,251	179,108	188,888	199,005	207,819	217,602
	R301	9,301 (5.4)	10,154 (5.7)	11,162 (5.9)	12,321 (6.2)	13,400 (6.4)	14,549 (6.7)
	R302	4,374 (2.5)	4,857 (2.7)	5,492 (2.9)	6,081 (3.1)	6,787 (3.3)	7,833 (3.6)
	R303	5,741 (3.3)	6,361 (3.6)	7,170 (3.8)	8,026 (4.0)	8,830 (4.2)	9,647 (4.4)
	R304	7,103 (4.1)	7,413 (4.1)	7,865 (4.2)	8,416 (4.2)	8,883 (4.3)	9,267 (4.3)
	R305	17,425 (10.1)	17,272 (9.6)	16,947 (9.0)	17,073 (8.6)	16,993 (8.2)	16,894 (7.8)
	R306	8,078 (4.7)	8,600 (4.8)	9,133 (4.8)	9,788 (4.9)	10,196 (4.9)	10,529 (4.8)
	R307	8,978 (5.2)	9,385 (5.2)	10,145 (5.4)	10,811 (5.4)	11,477 (5.5)	12,202 (5.6)
	R308	12,590 (7.3)	12,567 (7.0)	12,349 (6.5)	12,619 (6.3)	12,793 (6.2)	13,255 (6.1)
	R309	9,694 (5.6)	9,821 (5.5)	10,052 (5.3)	9,953 (5.0)	10,034 (4.8)	9,963 (4.6)
	R310	8,905 (5.2)	9,059 (5.1)	9,428 (5.0)	9,695 (4.9)	9,977 (4.8)	10,186 (4.7)
	R311	11,076 (6.4)	11,058 (6.2)	11,207 (5.9)	11,421 (5.7)	11,461 (5.5)	11,579 (5.3)
	R312	9,769 (5.7)	9,911 (5.5)	9,992 (5.3)	10,065 (5.1)	10,143 (4.9)	10,164 (4.7)
	R313	16,525 (9.6)	16,914 (9.4)	17,466 (9.2)	17,893 (9.0)	18,188 (8.8)	18,442 (8.5)
	R314	10,002 (5.8)	10,732 (6.0)	11,813 (6.3)	12,879 (6.5)	13,705 (6.6)	14,639 (6.7)
	R315	5,013 (2.9)	5,634 (3.1)	6,514 (3.4)	7,362 (3.7)	8,163 (3.9)	9,118 (4.2)
	R320	5,308 (3.1)	5,679 (3.2)	5,997 (3.2)	6,448 (3.2)	6,854 (3.3)	7,281 (3.3)
	R321	10,239 (5.9)	11,032 (6.2)	12,997 (6.9)	14,277 (7.2)	15,376 (7.4)	16,732 (7.7)
	R322	3,876 (2.3)	3,953 (2.2)	4,064 (2.2)	4,187 (2.1)	4,276 (2.1)	4,360 (2.0)
	R323	8,254 (4.8)	8,706 (4.9)	9,095 (4.8)	9,690 (4.9)	10,283 (4.9)	10,962 (5.0)
R4	n	53,618	54,960	56,803	59,092	60,956	63,047
	R401	3,377 (6.3)	3,507 (6.4)	3,644 (6.4)	3,799 (6.4)	3,898 (6.4)	3,973 (6.3)
	R402	2,418 (4.5)	2,499 (4.5)	2,578 (4.5)	2,691 (4.6)	2,784 (4.6)	2,851 (4.5)
	R403	5,998 (11.2)	6,242 (11.4)	6,478 (11.4)	6,712 (11.4)	6,889 (11.3)	7,083 (11.2)
	R404	4,205 (7.8)	4,248 (7.7)	4,342 (7.6)	4,453 (7.5)	4,509 (7.4)	4,613 (7.3)
	R405	5,274 (9.8)	5,385 (9.8)	5,589 (9.8)	5,800 (9.8)	5,947 (9.8)	6,124 (9.7)
	R406	17,856 (33.3)	18,335 (33.4)	19,129 (33.7)	20,245 (34.3)	21,282 (34.9)	22,408 (35.5)
	R407	3,684 (6.9)	3,812 (6.9)	3,966 (7.0)	4,131 (7.0)	4,253 (7.0)	4,365 (6.9)
	R408	6,345 (11.8)	6,433 (11.7)	6,535 (11.5)	6,661 (11.3)	6,732 (11.0)	6,850 (10.9)
	R409	4,461 (8.3)	4,499 (8.2)	4,542 (8.0)	4,600 (7.8)	4,662 (7.6)	4,780 (7.6)
R5	n	26,363	26,777	27,307	27,888	28,048	28,684
	R501	6,723 (25.5)	6,772 (25.3)	6,829 (25.0)	6,901 (24.7)	6,861 (24.5)	6,992 (24.4)
	R502	5,088 (19.3)	5,189 (19.4)	5,422 (19.9)	5,623 (20.2)	5,713 (20.4)	5,840 (20.4)
	R503	2,820 (10.7)	2,900 (10.8)	2,916 (10.7)	2,949 (10.6)	2,954 (10.5)	3,008 (10.5)
	R504	5,124 (19.4)	5,146 (19.2)	5,235 (19.2)	5,356 (19.2)	5,380 (19.2)	5,551 (19.4)
	R505	6,608 (25.1)	6,770 (25.3)	6,905 (25.3)	7,059 (25.3)	7,140 (25.5)	7,293 (25.4)

Continued on next page

TABLE E.2 continued from previous page

		99/00	00/01	01/02	02/03	03/04	04/05
R6	n	173,068	178,766	186,847	194,506	201,652	209,039
	R601	8,305 (4.8)	8,850 (5.0)	9,597 (5.1)	10,402 (5.3)	11,035 (5.5)	11,575 (5.5)
	R602	5,371 (3.1)	5,727 (3.2)	6,163 (3.3)	6,656 (3.4)	7,164 (3.6)	7,692 (3.7)
	R603	18,815 (10.9)	18,919 (10.6)	18,861 (10.1)	19,245 (9.9)	19,440 (9.6)	19,791 (9.5)
	R604	12,396 (7.2)	12,571 (7.0)	12,678 (6.8)	12,379 (6.4)	12,567 (6.2)	12,688 (6.1)
	R605	14,833 (8.6)	15,247 (8.5)	15,635 (8.4)	16,106 (8.3)	16,431 (8.1)	16,840 (8.1)
	R606	10,560 (6.1)	10,875 (6.1)	11,422 (6.1)	11,848 (6.1)	12,329 (6.1)	12,881 (6.2)
	R607	21,737 (12.6)	21,691 (12.1)	22,290 (11.9)	22,593 (11.6)	22,712 (11.3)	22,415 (10.7)
	R608	18,466 (10.7)	19,053 (10.7)	19,896 (10.6)	20,529 (10.6)	21,086 (10.5)	21,807 (10.4)
	R609	16,684 (9.6)	17,390 (9.7)	18,244 (9.8)	18,996 (9.8)	19,964 (9.9)	21,044 (10.1)
	R612	10,715 (6.2)	11,280 (6.3)	12,214 (6.5)	13,269 (6.8)	14,215 (7.0)	15,186 (7.3)
	R613	7,315 (4.2)	8,050 (4.5)	8,977 (4.8)	9,801 (5.0)	10,392 (5.2)	11,030 (5.3)
	R614	4,266 (2.5)	4,406 (2.5)	4,723 (2.5)	5,022 (2.6)	5,163 (2.6)	5,363 (2.6)
	R615	1,879 (1.1)	1,943 (1.1)	2,026 (1.1)	2,064 (1.1)	2,127 (1.1)	2,178 (1.0)
	R616	3,494 (2.0)	3,644 (2.0)	3,800 (2.0)	3,984 (2.0)	4,209 (2.1)	4,454 (2.1)
	R617	1,032 (0.6)	1,094 (0.6)	1,189 (0.6)	1,266 (0.7)	1,342 (0.7)	1,481 (0.7)
	R618	10,668 (6.2)	11,189 (6.3)	11,917 (6.4)	12,783 (6.6)	13,642 (6.8)	14,397 (6.9)
	R619	4,234 (2.4)	4,447 (2.5)	4,699 (2.5)	4,897 (2.5)	5,068 (2.5)	5,299 (2.5)
	R620	2,298 (1.3)	2,390 (1.3)	2,516 (1.3)	2,666 (1.4)	2,766 (1.4)	2,918 (1.4)
R7	n	30,679	31,405	32,522	33,529	34,374	35,474
	R701	5,254 (17.1)	5,426 (17.3)	5,686 (17.5)	5,902 (17.6)	6,111 (17.8)	6,378 (18.0)
	R702	9,666 (31.5)	9,840 (31.3)	10,143 (31.2)	10,470 (31.2)	10,708 (31.2)	10,995 (31.0)
	R703	5,771 (18.8)	5,967 (19.0)	6,238 (19.2)	6,449 (19.2)	6,641 (19.3)	6,877 (19.4)
	R704	9,988 (32.6)	10,172 (32.4)	10,455 (32.1)	10,708 (31.9)	10,914 (31.8)	11,224 (31.6)
R8	n	19,436	20,047	20,841	21,729	22,510	23,336
	R801	5,185 (26.7)	5,292 (26.4)	5,414 (26.0)	5,562 (25.6)	5,645 (25.1)	5,741 (24.6)
	R802	2,656 (13.7)	2,676 (13.3)	2,705 (13.0)	2,793 (12.9)	2,834 (12.6)	2,887 (12.4)
	R803	3,017 (15.5)	3,103 (15.5)	3,222 (15.5)	3,351 (15.4)	3,491 (15.5)	3,612 (15.5)
	R804	8,578 (44.1)	8,976 (44.8)	9,500 (45.6)	10,023 (46.1)	10,540 (46.8)	11,096 (47.5)
R9	n	4,625	4,958	5,348	5,805	6,246	6,645
	R901	571 (12.3)	583 (11.8)	618 (11.6)	656 (11.3)	676 (10.8)	695 (10.5)
	R902	477 (10.3)	516 (10.4)	548 (10.2)	591 (10.2)	626 (10.0)	654 (9.8)
	R903	872 (18.9)	909 (18.3)	937 (17.5)	952 (16.4)	977 (15.6)	984 (14.8)
	R904	2,705 (58.5)	2,950 (59.5)	3,245 (60.7)	3,606 (62.1)	3,967 (63.5)	4,312 (64.9)
Missing	n	12	11	15	20	21	18

TABLE E.3: ED visits by residential RHA and sRHA for each year.

		99/00	00/01	01/02	02/03	03/04	04/05	All
R1	n	935	947	1,126	809	928	900	5,645
	R101	208 (22.2)	196 (20.7)	146 (13.0)	174 (21.5)	241 (26.0)	203 (22.6)	1,168 (20.7)
	R102	127 (13.6)	132 (13.9)	305 (27.1)	109 (13.5)	133 (14.3)	164 (18.2)	970 (17.2)
	R103	320 (34.2)	329 (34.7)	290 (25.8)	315 (38.9)	339 (36.5)	319 (35.4)	1,912 (33.9)
	R104	186 (19.9)	218 (23.0)	312 (27.7)	138 (17.1)	127 (13.7)	109 (12.1)	1,090 (19.3)
	R105	94 (10.1)	72 (7.6)	73 (6.5)	73 (9.0)	88 (9.5)	105 (11.7)	505 (8.9)
R2	n	412	363	289	343	421	487	2,315
	R201	243 (59.0)	225 (62.0)	234 (81.0)	239 (69.7)	330 (78.4)	338 (69.4)	1,609 (69.5)
	R202	169 (41.0)	138 (38.0)	55 (19.0)	104 (30.3)	91 (21.6)	149 (30.6)	706 (30.5)
R3	n	2,552	2,403	2,522	2,448	2,713	2,862	15,500
	R301	65 (2.5)	46 (1.9)	35 (1.4)	64 (2.6)	68 (2.5)	65 (2.3)	343 (2.2)
	R302	37 (1.4)	50 (2.1)	50 (2.0)	31 (1.3)	29 (1.1)	40 (1.4)	237 (1.5)
	R303	46 (1.8)	52 (2.2)	68 (2.7)	68 (2.8)	63 (2.3)	77 (2.7)	374 (2.4)
	R304	57 (2.2)	57 (2.4)	32 (1.3)	41 (1.7)	55 (2.0)	48 (1.7)	290 (1.9)
	R305	218 (8.5)	176 (7.3)	193 (7.7)	185 (7.6)	160 (5.9)	197 (6.9)	1,129 (7.3)
	R306	114 (4.5)	127 (5.3)	111 (4.4)	136 (5.6)	123 (4.5)	130 (4.5)	741 (4.8)
	R307	127 (5.0)	108 (4.5)	140 (5.6)	117 (4.8)	129 (4.8)	126 (4.4)	747 (4.8)
	R308	220 (8.6)	204 (8.5)	258 (10.2)	188 (7.7)	240 (8.8)	300 (10.5)	1,410 (9.1)
	R309	235 (9.2)	219 (9.1)	191 (7.6)	138 (5.6)	222 (8.2)	194 (6.8)	1,199 (7.7)
	R310	165 (6.5)	150 (6.2)	173 (6.9)	157 (6.4)	162 (6.0)	169 (5.9)	976 (6.3)
	R311	207 (8.1)	194 (8.1)	168 (6.7)	179 (7.3)	172 (6.3)	222 (7.8)	1,142 (7.4)
	R312	132 (5.2)	129 (5.4)	129 (5.1)	128 (5.2)	144 (5.3)	121 (4.2)	783 (5.1)
	R313	237 (9.3)	207 (8.6)	199 (7.9)	207 (8.5)	253 (9.3)	289 (10.1)	1,392 (9.0)
	R314	68 (2.7)	62 (2.6)	84 (3.3)	80 (3.3)	98 (3.6)	104 (3.6)	496 (3.2)
	R315	54 (2.1)	42 (1.7)	66 (2.6)	73 (3.0)	84 (3.1)	83 (2.9)	402 (2.6)
	R320	81 (3.2)	64 (2.7)	95 (3.8)	85 (3.5)	93 (3.4)	71 (2.5)	489 (3.2)
	R321	202 (7.9)	170 (7.1)	208 (8.2)	214 (8.7)	241 (8.9)	259 (9.0)	1,294 (8.3)
	R322	87 (3.4)	121 (5.0)	129 (5.1)	163 (6.7)	140 (5.2)	127 (4.4)	767 (4.9)
	R323	200 (7.8)	225 (9.4)	193 (7.7)	194 (7.9)	237 (8.7)	240 (8.4)	1,289 (8.3)
R4	n	2,558	2,149	2,359	1,897	2,362	2,728	14,053
	R401	299 (11.7)	270 (12.6)	219 (9.3)	186 (9.8)	245 (10.4)	272 (10.0)	1,491 (10.6)
	R402	50 (2.0)	76 (3.5)	93 (3.9)	55 (2.9)	56 (2.4)	107 (3.9)	437 (3.1)
	R403	281 (11.0)	256 (11.9)	246 (10.4)	193 (10.2)	250 (10.6)	290 (10.6)	1,516 (10.8)
	R404	144 (5.6)	163 (7.6)	238 (10.1)	164 (8.6)	250 (10.6)	273 (10.0)	1,232 (8.8)
	R405	565 (22.1)	346 (16.1)	444 (18.8)	317 (16.7)	309 (13.1)	384 (14.1)	2,365 (16.8)
	R406	436 (17.0)	443 (20.6)	438 (18.6)	410 (21.6)	545 (23.1)	523 (19.2)	2,795 (19.9)
	R407	161 (6.3)	107 (5.0)	84 (3.6)	87 (4.6)	138 (5.8)	112 (4.1)	689 (4.9)
	R408	279 (10.9)	193 (9.0)	231 (9.8)	258 (13.6)	316 (13.4)	405 (14.8)	1,682 (12.0)
	R409	343 (13.4)	295 (13.7)	366 (15.5)	227 (12.0)	253 (10.7)	362 (13.3)	1,846 (13.1)
R5	n	1,145	1,298	1,430	1,120	1,191	1,259	7,443
	R501	458 (40.0)	687 (52.9)	761 (53.2)	543 (48.5)	446 (37.4)	515 (40.9)	3,410 (45.8)
	R502	93 (8.1)	62 (4.8)	89 (6.2)	99 (8.8)	130 (10.9)	130 (10.3)	603 (8.1)
	R503	97 (8.5)	111 (8.6)	85 (5.9)	92 (8.2)	98 (8.2)	83 (6.6)	566 (7.6)
	R504	318 (27.8)	255 (19.6)	311 (21.7)	222 (19.8)	277 (23.3)	293 (23.3)	1,676 (22.5)
	R505	179 (15.6)	183 (14.1)	184 (12.9)	164 (14.6)	240 (20.2)	238 (18.9)	1,188 (16.0)

Continued on next page

TABLE E.3 continued from previous page

		99/00	00/01	01/02	02/03	03/04	04/05	All
R6	n	3,236	3,291	3,408	3,438	4,114	4,219	21,706
	R601	226 (7.0)	229 (7.0)	220 (6.5)	210 (6.1)	172 (4.2)	163 (3.9)	1,220 (5.6)
	R602	88 (2.7)	66 (2.0)	90 (2.6)	97 (2.8)	108 (2.6)	131 (3.1)	580 (2.7)
	R603	375 (11.6)	456 (13.9)	392 (11.5)	437 (12.7)	439 (10.7)	507 (12.0)	2,606 (12.0)
	R604	311 (9.6)	355 (10.8)	402 (11.8)	346 (10.1)	433 (10.5)	409 (9.7)	2,256 (10.4)
	R605	327 (10.1)	339 (10.3)	305 (8.9)	327 (9.5)	380 (9.2)	455 (10.8)	2,133 (9.8)
	R606	194 (6.0)	290 (8.8)	265 (7.8)	279 (8.1)	394 (9.6)	376 (8.9)	1,798 (8.3)
	R607	334 (10.3)	311 (9.5)	353 (10.4)	329 (9.6)	369 (9.0)	346 (8.2)	2,042 (9.4)
	R608	222 (6.9)	189 (5.7)	264 (7.7)	243 (7.1)	269 (6.5)	257 (6.1)	1,444 (6.7)
	R609	145 (4.5)	122 (3.7)	125 (3.7)	137 (4.0)	169 (4.1)	166 (3.9)	864 (4.0)
	R612	155 (4.8)	134 (4.1)	143 (4.2)	123 (3.6)	125 (3.0)	183 (4.3)	863 (4.0)
	R613	60 (1.9)	77 (2.3)	74 (2.2)	57 (1.7)	115 (2.8)	111 (2.6)	494 (2.3)
	R614	68 (2.1)	63 (1.9)	41 (1.2)	47 (1.4)	77 (1.9)	66 (1.6)	362 (1.7)
	R615	38 (1.2)	45 (1.4)	71 (2.1)	69 (2.0)	63 (1.5)	74 (1.8)	360 (1.7)
	R616	161 (5.0)	147 (4.5)	142 (4.2)	135 (3.9)	186 (4.5)	162 (3.8)	933 (4.3)
	R617	35 (1.1)	10 (0.3)	17 (0.5)	9 (0.3)	20 (0.5)	23 (0.5)	114 (0.5)
	R618	183 (5.7)	205 (6.2)	276 (8.1)	385 (11.2)	484 (11.8)	448 (10.6)	1,981 (9.1)
	R619	153 (4.7)	165 (5.0)	171 (5.0)	135 (3.9)	232 (5.6)	245 (5.8)	1,101 (5.1)
	R620	161 (5.0)	88 (2.7)	57 (1.7)	73 (2.1)	79 (1.9)	97 (2.3)	555 (2.6)
R7	n	1,420	1,621	1,556	1,477	1,808	1,785	9,667
	R701	255 (18.0)	275 (17.0)	253 (16.3)	213 (14.4)	230 (12.7)	240 (13.4)	1,466 (15.2)
	R702	335 (23.6)	289 (17.8)	385 (24.7)	359 (24.3)	541 (29.9)	528 (29.6)	2,437 (25.2)
	R703	387 (27.3)	518 (32.0)	496 (31.9)	426 (28.8)	455 (25.2)	455 (25.5)	2,737 (28.3)
	R704	443 (31.2)	539 (33.3)	422 (27.1)	479 (32.4)	582 (32.2)	562 (31.5)	3,027 (31.3)
R8	n	1,187	1,123	1,221	1,149	1,393	1,546	7,619
	R801	368 (31.0)	288 (25.6)	330 (27.0)	389 (33.9)	485 (34.8)	438 (28.3)	2,298 (30.2)
	R802	215 (18.1)	236 (21.0)	228 (18.7)	165 (14.4)	199 (14.3)	270 (17.5)	1,313 (17.2)
	R803	124 (10.4)	123 (11.0)	109 (8.9)	151 (13.1)	144 (10.3)	198 (12.8)	849 (11.1)
	R804	480 (40.4)	476 (42.4)	554 (45.4)	444 (38.6)	565 (40.6)	640 (41.4)	3,159 (41.5)
R9	n	157	191	204	210	293	324	1,379
	R901, R902	37 (23.5)	32 (16.8)	29 (14.2)	37 (17.6)	34 (11.6)	54 (16.6)	223[1] (16.2)
	R903	29 (18.5)	43 (22.5)	75 (36.8)	57 (27.1)	78 (26.6)	67 (20.7)	349 (25.3)
	R904	91 (58.0)	116 (60.7)	100 (49.0)	116 (55.2)	181 (61.8)	203 (62.7)	807 (58.5)
Missing	n	0	0	1	0	2	0	3

[1]R901 and R902 had 178 and 45 visits during the study period, respectively.

TABLE E.4: Individuals by residential RHA and sRHA for each year.

		99/00	00/01	01/02	02/03	03/04	04/05	All
R1	n	616	591	571	560	612	626	2,633
	R101	144 (23.4)	137 (23.2)	114 (20.0)	128 (22.9)	171 (27.9)	142 (22.7)	
	R102	102 (16.6)	86 (14.6)	100 (17.5)	81 (14.5)	90 (14.7)	106 (16.9)	
	R103	224 (36.4)	202 (34.2)	179 (31.3)	211 (37.7)	220 (35.9)	223 (35.6)	
	R104	94 (15.3)	103 (17.4)	130 (22.8)	81 (14.5)	71 (11.6)	81 (12.9)	
	R105	52 (8.4)	63 (10.7)	48 (8.4)	59 (10.5)	60 (9.8)	74 (11.8)	
R2	n	226	208	200	235	285	287	1,046
	R201	165 (73.0)	159 (76.4)	168 (84.0)	183 (77.9)	227 (79.6)	217 (75.6)	
	R202	61 (27.0)	49 (23.6)	32 (16.0)	52 (22.1)	58 (20.4)	70 (24.4)	
R3	n	1,749	1,573	1,685	1,662	1,836	2,023	7,563
	R301	44 (2.5)	34 (2.2)	31 (1.8)	51 (3.1)	44 (2.4)	50 (2.5)	
	R302	24 (1.4)	23 (1.5)	25 (1.5)	23 (1.4)	22 (1.2)	32 (1.6)	
	R303	32 (1.8)	33 (2.1)	46 (2.7)	46 (2.8)	40 (2.2)	64 (3.2)	
	R304	43 (2.5)	39 (2.5)	26 (1.5)	33 (2.0)	42 (2.3)	41 (2.0)	
	R305	150 (8.6)	121 (7.7)	111 (6.6)	124 (7.5)	113 (6.2)	155 (7.7)	
	R306	83 (4.7)	73 (4.6)	81 (4.8)	81 (4.9)	83 (4.5)	90 (4.4)	
	R307	87 (5.0)	75 (4.8)	97 (5.8)	86 (5.2)	84 (4.6)	93 (4.6)	
	R308	153 (8.7)	146 (9.3)	148 (8.8)	120 (7.2)	149 (8.1)	206 (10.2)	
	R309	147 (8.4)	121 (7.7)	112 (6.6)	99 (6.0)	121 (6.6)	125 (6.2)	
	R310	115 (6.6)	91 (5.8)	115 (6.8)	114 (6.9)	122 (6.6)	123 (6.1)	
	R311	135 (7.7)	118 (7.5)	114 (6.8)	120 (7.2)	122 (6.6)	157 (7.8)	
	R312	93 (5.3)	92 (5.8)	93 (5.5)	87 (5.2)	109 (5.9)	89 (4.4)	
	R313	168 (9.6)	147 (9.3)	148 (8.8)	148 (8.9)	186 (10.1)	198 (9.8)	
	R314	53 (3.0)	47 (3.0)	58 (3.4)	61 (3.7)	80 (4.4)	77 (3.8)	
	R315	41 (2.3)	30 (1.9)	49 (2.9)	51 (3.1)	63 (3.4)	68 (3.4)	
	R320	50 (2.9)	42 (2.7)	59 (3.5)	54 (3.2)	55 (3.0)	48 (2.4)	
	R321	130 (7.4)	107 (6.8)	138 (8.2)	126 (7.6)	148 (8.1)	156 (7.7)	
	R322	59 (3.4)	70 (4.5)	72 (4.3)	91 (5.5)	76 (4.1)	81 (4.0)	
	R323	142 (8.1)	164 (10.4)	162 (9.6)	147 (8.8)	177 (9.6)	170 (8.4)	
R4	n	1,536	1,311	1,408	1,235	1,486	1,674	6,182
	R401	168 (10.9)	141 (10.8)	147 (10.4)	118 (9.6)	156 (10.5)	189 (11.3)	
	R402	36 (2.3)	55 (4.2)	55 (3.9)	47 (3.8)	41 (2.8)	61 (3.6)	
	R403	193 (12.6)	184 (14.0)	182 (12.9)	136 (11.0)	198 (13.3)	217 (13.0)	
	R404	100 (6.5)	91 (6.9)	116 (8.2)	111 (9.0)	132 (8.9)	139 (8.3)	
	R405	286 (18.6)	193 (14.7)	235 (16.7)	205 (16.6)	201 (13.5)	209 (12.5)	
	R406	282 (18.4)	300 (22.9)	300 (21.3)	267 (21.6)	362 (24.4)	346 (20.7)	
	R407	108 (7.0)	74 (5.6)	73 (5.2)	64 (5.2)	83 (5.6)	79 (4.7)	
	R408	211 (13.7)	144 (11.0)	159 (11.3)	183 (14.8)	208 (14.0)	289 (17.3)	
	R409	152 (9.9)	129 (9.8)	141 (10.0)	104 (8.4)	105 (7.1)	145 (8.7)	
R5	n	630	671	712	599	688	678	2,796
	R501	264 (41.9)	335 (49.9)	341 (47.9)	269 (44.9)	262 (38.1)	281 (41.4)	
	R502	63 (10.0)	45 (6.7)	41 (5.8)	57 (9.5)	59 (8.6)	63 (9.3)	
	R503	43 (6.8)	46 (6.9)	56 (7.9)	44 (7.3)	55 (8.0)	54 (8.0)	
	R504	140 (22.2)	121 (18.0)	139 (19.5)	109 (18.2)	141 (20.5)	124 (18.3)	
	R505	120 (19.0)	124 (18.5)	135 (19.0)	120 (20.0)	171 (24.9)	156 (23.0)	

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TABLE E.4 continued from previous page

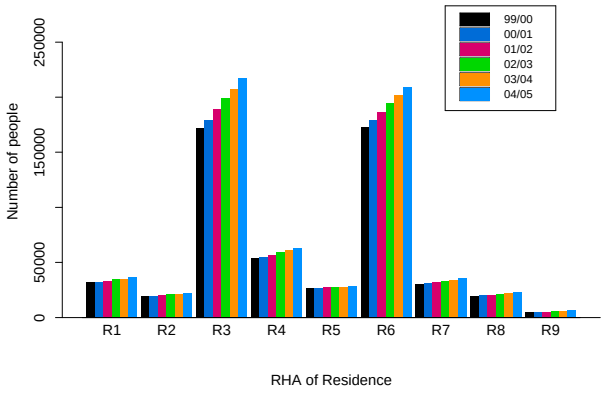
		99/00	00/01	01/02	02/03	03/04	04/05	All
R6	n	2,141	2,119	2,279	2,341	2,743	2,862	10,425
	R601	150 (7.0)	143 (6.7)	138 (6.1)	125 (5.3)	118 (4.3)	131 (4.6)	
	R602	58 (2.7)	53 (2.5)	61 (2.7)	69 (2.9)	73 (2.7)	104 (3.6)	
	R603	254 (11.9)	271 (12.8)	261 (11.5)	289 (12.3)	294 (10.7)	326 (11.4)	
	R604	204 (9.5)	210 (9.9)	237 (10.4)	215 (9.2)	273 (10.0)	266 (9.3)	
	R605	197 (9.2)	209 (9.9)	218 (9.6)	217 (9.3)	273 (10.0)	293 (10.2)	
	R606	126 (5.9)	163 (7.7)	169 (7.4)	158 (6.7)	248 (9.0)	233 (8.1)	
	R607	257 (12.0)	223 (10.5)	233 (10.2)	241 (10.3)	258 (9.4)	234 (8.2)	
	R608	161 (7.5)	141 (6.7)	189 (8.3)	165 (7.0)	209 (7.6)	197 (6.9)	
	R609	107 (5.0)	97 (4.6)	105 (4.6)	109 (4.7)	120 (4.4)	115 (4.0)	
	R612	111 (5.2)	94 (4.4)	96 (4.2)	95 (4.1)	97 (3.5)	132 (4.6)	
	R613	50 (2.3)	54 (2.5)	57 (2.5)	49 (2.1)	79 (2.9)	69 (2.4)	
	R614	37 (1.7)	40 (1.9)	29 (1.3)	34 (1.5)	41 (1.5)	41 (1.4)	
	R615.	28 (1.3)	34 (1.6)	42 (1.8)	55 (2.3)	50 (1.8)	57 (2.0)	
	R616	109 (5.1)	92 (4.3)	100 (4.4)	99 (4.2)	125 (4.6)	130 (4.5)	
	R617	20 (0.9)	9 (0.4)	12 (0.5)	8 (0.3)	18 (0.7)	19 (0.7)	
	R618	125 (5.8)	136 (6.4)	192 (8.4)	274 (11.7)	311 (11.3)	335 (11.7)	
	R619	102 (4.8)	108 (5.1)	106 (4.7)	94 (4.0)	112 (4.1)	131 (4.6)	
	R620	45 (2.1)	42 (2.0)	34 (1.5)	45 (1.9)	44 (1.6)	49 (1.7)	
R7	n	876	891	901	857	1,072	1,076	3,965
	R701	180 (20.5)	165 (18.5)	145 (16.1)	128 (14.9)	150 (14.0)	156 (14.5)	
	R702	219 (25.0)	182 (20.4)	248 (27.5)	225 (26.3)	316 (29.5)	323 (30.0)	
	R703	196 (22.4)	261 (29.3)	218 (24.2)	217 (25.3)	239 (22.3)	246 (22.9)	
	R704	281 (32.1)	283 (31.8)	290 (32.2)	287 (33.5)	367 (34.2)	351 (32.6)	
R8	n	840	812	838	811	963	1,012	3,648
	R801	244 (29.0)	190 (23.4)	194 (23.2)	262 (32.3)	329 (34.2)	282 (27.9)	
	R802	147 (17.5)	169 (20.8)	169 (20.2)	123 (15.2)	139 (14.4)	184 (18.2)	
	R803	86 (10.2)	87 (10.7)	79 (9.4)	95 (11.7)	99 (10.3)	119 (11.8)	
	R804	363 (43.2)	366 (45.1)	396 (47.3)	331 (40.8)	396 (41.1)	427 (42.2)	
R9	n	136	147	154	148	230	247	781
	R901, R902	32 (23.5)	28 (19.0)	23 (14.9)	18 (12.2)	29 (12.6)	34 (13.8)	
	R903	26 (19.1)	25 (17.0)	45 (29.2)	37 (25.0)	60 (26.1)	53 (21.5)	
	R904	78 (57.4)	94 (63.9)	86 (55.8)	93 (62.8)	141 (61.3)	160 (64.8)	
Missing	n	0	0	1	0	1	0	2

TABLE E.5: Sex and age group directly standardized visit rates per 1,000 population by RHA for each fiscal year.

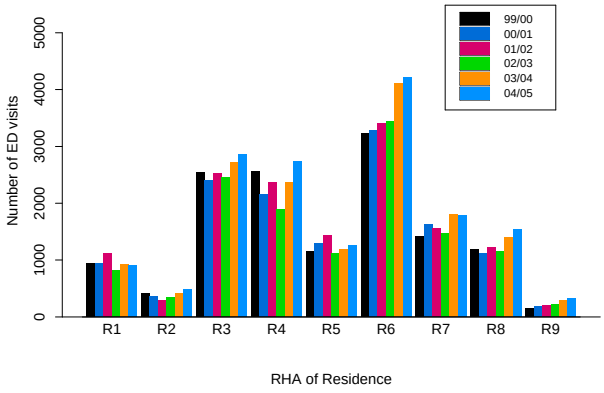
	99/00	00/01	01/02	02/03	03/04	04/05
R1 DSVR	27.8 (1.7)	27.5 (1.7)	32.6 (3.3)	22.2 (1.2)	25.0 (1.3)	23.8 (1.3)
95% CI	24.4 to 31.3	24.2 to 30.8	26.2 to 39.0	19.8 to 24.5	22.5 to 27.6	21.3 to 26.2
R2 DSVR	20.6 (3.8)	17.0 (2.4)	13.3 (1.2)	15.2 (1.4)	18.9 (1.5)	21.7 (2.0)
95% CI	13.2 to 27.9	12.3 to 21.6	11.0 to 15.6	12.5 to 18.0	16.0 to 21.8	17.8 to 25.7
R3 DSVR	15.3 (0.5)	13.8 (0.5)	13.8 (0.4)	12.9 (0.4)	13.7 (0.4)	13.9 (0.4)
95% CI	14.4 to 16.2	12.9 to 14.7	13.0 to 14.7	12.1 to 13.7	12.8 to 14.5	13.1 to 14.6
R4 DSVR	46.6 (1.7)	38.2 (1.5)	40.9 (2.0)	31.5 (1.2)	38.4 (1.4)	42.8 (1.6)
95% CI	43.2 to 49.9	35.3 to 41.2	36.9 to 44.9	29.1 to 33.9	35.7 to 41.2	39.7 to 46.0
R5 DSVR	40.3 (2.4)	44.8 (2.7)	49.3 (2.9)	37.5 (2.6)	39.9 (2.3)	41.8 (3.5)
95% CI	35.7 to 45.0	39.6 to 50.0	43.7 to 54.9	32.4 to 42.6	35.4 to 44.4	35.0 to 48.7
R6 DSVR	19.0 (0.6)	18.6 (0.6)	18.6 (0.5)	18.0 (0.5)	20.8 (0.6)	20.7 (0.5)
95% CI	17.9 to 20.1	17.5 to 19.8	17.5 to 19.6	17.1 to 19.0	19.7 to 21.9	19.7 to 21.7
R7 DSVR	46.7 (2.6)	51.9 (3.0)	47.9 (2.6)	44.9 (2.3)	53.5 (2.4)	51.1 (2.3)
95% CI	41.6 to 51.8	46.1 to 57.8	42.9 to 53.0	40.5 to 49.3	48.8 to 58.2	46.6 to 55.6
R8 DSVR	61.9 (2.7)	56.7 (2.5)	60.1 (2.7)	54.4 (2.3)	63.8 (2.6)	68.4 (2.8)
95% CI	56.5 to 67.2	51.8 to 61.5	54.8 to 65.4	49.8 to 59.0	58.6 to 68.9	62.8 to 73.9
R9 DSVR	43.4 (4.4)	50.0 (6.1)	45.6 (4.8)	48.5 (6.2)	63.4 (5.5)	62.7 (5.4)
95% CI	34.8 to 52.0	38.1 to 61.9	36.2 to 55.0	36.4 to 60.7	52.5 to 74.3	52.1 to 73.3

FIGURE E.1: Population, ED visits, and distinct individuals making ED visits by RHA of residence for each fiscal year.

(a) Population



(b) ED Visits



(c) Distinct Individuals

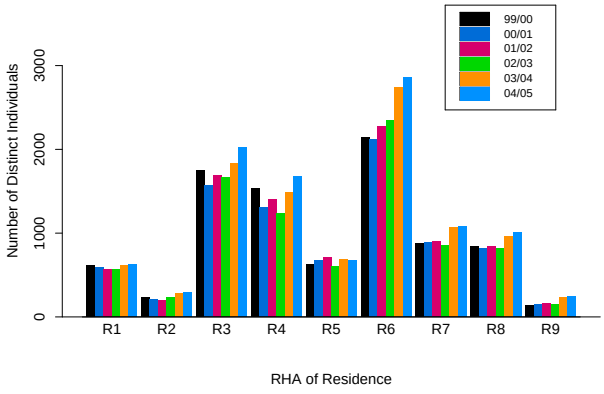
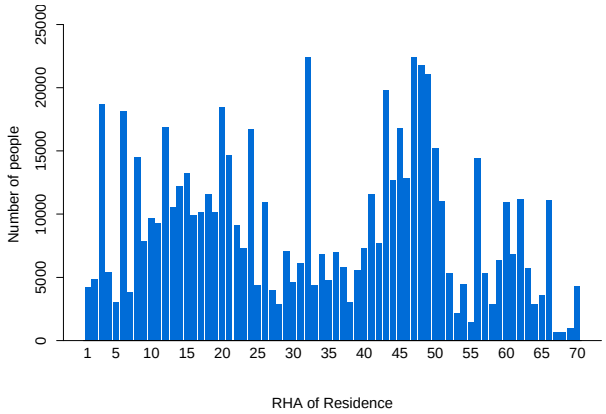
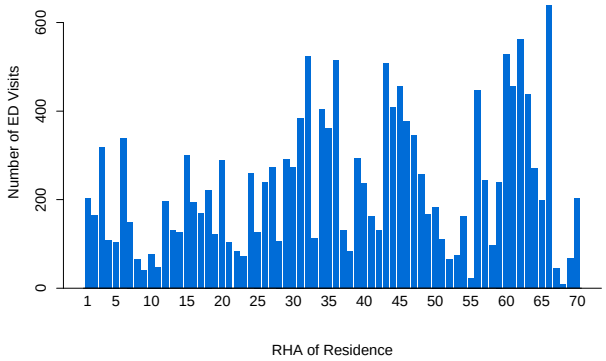


FIGURE E.2: Population, ED visits, and distinct individuals making ED visits by sRHA of residence for 2004/2005.

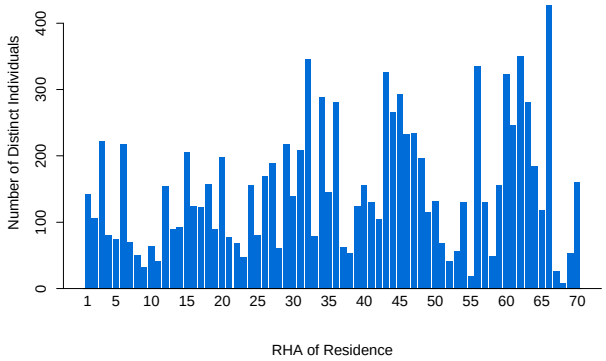
(a) Population



(b) ED Visits



(c) Distinct Individuals



F Follow-up Visits After ED Visit End Date

TABLE F.1: Demographic information for the discharged subset by all in the subset and by those who had at least one follow-up visit. Counts and percentages (%) are provided by sex, age group, socio-economic proxy (pSES, age 55–64 yrs), modified socio-economic proxy (mSES, age $\geq$ 55 yrs) and Regional Health Authority (RHA).

	All		≥ 1 **Follow-up**	
n	7,302		6,415	
Sex				
F	3,619	(49.6)	3,191	(49.7)
M	3,683	(50.4)	3,224	(50.3)
Age Group				
55-59	1,270	(17.4)	1,083	(16.9)
60-64	1,060	(14.5)	930	(14.5)
65-69	1,142	(15.6)	1,007	(15.7)
70-74	1,176	(16.1)	1,039	(16.2)
75-79	1,133	(15.5)	1,004	(15.7)
80+	1,521	(20.8)	1,352	(21.1)
pSES				
A	195	(8.4)	168	(8.3)
R	1,341	(57.6)	1,153	(57.3)
S	474	(20.3)	406	(20.2)
W	320	(13.7)	286	(14.2)
modifSES				
A	410	(5.6)	362	(5.6)
nonA	6,892	(94.4)	6,053	(94.4)
RHA				
R1	450	(6.2)	392	(6.1)
R2	186	(2.5)	162	(2.5)
R3	1,077	(14.7)	967	(15.1)
R4	1,220	(16.7)	1,059	(16.5)
R5	555	(7.6)	483	(7.5)
R6	1,840	(25.2)	1,638	(25.6)
R7	894	(12.2)	780	(12.2)
R8	869	(11.9)	749	(11.7)
R9	211	(2.9)	184	(2.9)

TABLE F.2: Follow-up visits and distinct individuals for the discharged subset.

	Days Since ED Visit End Date				
	7	**14**	**30**	**90**	**365**
Follow-up Visits	5,749	10,552	20,032	49,639	172,597
Individuals	2,887	3,962	4,992	5,972	6,415

TABLE F.3: Follow-up visits and individuals by age group for the discharged subset.

	Days Since ED Visit End Date				
	7	**14**	**30**	**90**	**365**
Follow-up visits					
n	5,749	10,552	20,032	49,639	172,597
55-59	719 (12.5)	1,319 (12.5)	2,577 (12.9)	6,460 (13.0)	24,309 (14.1)
60-64	700 (12.2)	1,317 (12.5)	2,437 (12.2)	6,271 (12.6)	22,507 (13.0)
65-69	947 (16.5)	1,710 (16.2)	3,155 (15.7)	7,766 (15.6)	26,110 (15.1)
70-74	948 (16.5)	1,730 (16.4)	3,417 (17.1)	8,607 (17.3)	28,619 (16.6)
75-79	1,106 (19.2)	2,031 (19.2)	3,752 (18.7)	9,004 (18.1)	31,720 (18.4)
80+	1,329 (23.1)	2,445 (23.2)	4,694 (23.4)	11,531 (23.2)	39,332 (22.8)
Distinct Individuals					
n	2,887	3,962	4,992	5,972	6,415
55-59	407 (14.1)	570 (14.4)	746 (14.9)	948 (15.9)	1,083 (16.9)
60-64	364 (12.6)	519 (13.1)	664 (13.3)	842 (14.1)	930 (14.5)
65-69	450 (15.6)	613 (15.5)	791 (15.8)	939 (15.7)	1,007 (15.7)
70-74	476 (16.5)	668 (16.9)	845 (16.9)	993 (16.6)	1,039 (16.2)
75-79	514 (17.8)	672 (17.0)	825 (16.5)	958 (16.0)	1,004 (15.7)
80+	676 (23.4)	920 (23.2)	1,121 (22.5)	1,292 (21.6)	1,352 (21.1)

TABLE F.4: Follow-up visits and individuals by sex for the discharged subset.

	Days Since ED Visit End Date				
	7	**14**	**30**	**90**	**365**
Follow-up visits					
n	5,749	10,552	20,032	49,639	172,597
F	2,760 (48.0)	5,056 (47.9)	9,522 (47.5)	23,741 (47.8)	84,181 (48.8)
M	2,989 (52.0)	5,496 (52.1)	10,510 (52.5)	25,898 (52.2)	88,416 (51.2)
Distinct Individuals					
n	2,887	3,962	4,992	5,972	6,415
F	1,442 (49.9)	2,000 (50.5)	2,514 (50.4)	3,002 (50.3)	3,191 (49.7)
M	1,445 (50.1)	1,962 (49.5)	2,478 (49.6)	2,970 (49.7)	3,224 (50.3)

TABLE F.5: Follow-up visits and individuals by pSES (age 55–64) for the discharged subset.

	Days Since ED Visit End Date				
	7	**14**	**30**	**90**	**365**
Follow-up visits					
n	1,419	2,636	5,014	12,731	46,816
A	120 (8.5)	205 (7.8)	398 (7.9)	1,212 (9.5)	5,100 (10.9)
R	670 (47.2)	1,280 (48.6)	2,452 (48.9)	5,923 (46.5)	21,190 (45.3)
S	335 (23.6)	625 (23.7)	1,155 (23.0)	2,751 (21.6)	9,949 (21.3)
W	294 (20.7)	526 (20.0)	1,009 (20.1)	2,845 (22.3)	10,577 (22.6)
Distinct Individuals					
n	771	1,089	1,410	1,790	2,013
A	69 (8.9)	94 (8.6)	121 (8.6)	154 (8.6)	168 (8.3)
R	394 (51.1)	567 (52.1)	756 (53.6)	992 (55.4)	1,153 (57.3)
S	165 (21.4)	242 (22.2)	305 (21.6)	370 (20.7)	406 (20.2)
W	143 (18.5)	186 (17.1)	228 (16.2)	274 (15.3)	286 (14.2)

TABLE F.6: Follow-up visits and individuals by mSES for the discharged subset.

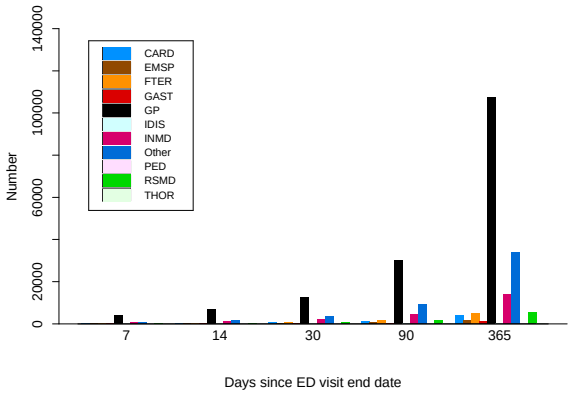
	Days Since ED Visit End Date				
	7	**14**	**30**	**90**	**365**
Follow-up visits					
n	5,749	10,552	20,032	49,639	172,597
A	271 (4.7)	494 (4.7)	938 (4.7)	2,613 (5.3)	10,667 (6.2)
nonA	5,478 (95.3)	10,058 (95.3)	19,094 (95.3)	47,026 (94.7)	161,930 (93.8)
Distinct Individuals					
n	2,887	3,962	4,992	5,972	6,415
A	156 (5.4)	212 (5.4)	269 (5.4)	334 (5.6)	362 (5.6)
nonA	2,731 (94.6)	3,750 (94.6)	4,723 (94.6)	5,638 (94.4)	6,053 (94.4)

TABLE F.7: Follow-up visits and individuals by physician type for the discharged subset.

	Days Since ED Visit End Date				
	7	**14**	**30**	**90**	**365**
Follow-up visits					
n	5,749	10,552	20,032	49,639	172,597
CARD	112 (1.9)	228 (2.2)	509 (2.5)	1,226 (2.5)	3,797 (2.2)
EMSP	106 (1.8)	145 (1.4)	253 (1.3)	515 (1.0)	1,654 (1.0)
FTER	264 (4.6)	405 (3.8)	660 (3.3)	1,494 (3.0)	5,062 (2.9)
GAST	38 (0.7)	65 (0.6)	115 (0.6)	251 (0.5)	1,081 (0.6)
GP	3,941 (68.6)	6,883 (65.2)	12,426 (62.0)	30,253 (60.9)	107,405 (62.2)
IDIS, PED, THOR	7 (0.1)	15 (0.1)	44 (0.2)	141 (0.3)	434 (0.3)
INMD	468 (8.1)	976 (9.2)	1,949 (9.7)	4,709 (9.5)	13,907 (8.1)
RSMD	143 (2.5)	295 (2.8)	686 (3.4)	1,840 (3.7)	5,287 (3.1)
Other	670 (11.7)	1,540 (14.6)	3,390 (16.9)	9,210 (18.6)	33,970 (19.7)
Individuals					
CARD	53 (1.5)	95 (1.8)	177 (2.3)	367 (3.1)	836 (4.7)
EMSP	95 (2.7)	126 (2.4)	207 (2.7)	367 (3.1)	797 (4.5)
FTER	210 (5.9)	304 (5.7)	468 (6.0)	825 (7.1)	1,621 (9.1)
GAST	19 (0.5)	30 (0.6)	55 (0.7)	119 (1.0)	342 (1.9)
GP	2,544 (71.1)	3,554 (66.5)	4,622 (59.5)	5,763 (49.3)	6,352 (35.7)
IDIS, PED, THOR	6 (0.2)	10 (0.2)	25 (0.3)	68 (0.6)	176 (1.0)
INMD	221 (6.2)	382 (7.1)	669 (8.6)	1,219 (10.4)	2,301 (12.9)
RSMD	67 (1.9)	116 (2.2)	224 (2.9)	488 (4.2)	910 (5.1)
Other	362 (10.1)	727 (13.6)	1,326 (17.1)	2,467 (21.1)	4,445 (25.0)

FIGURE F.1: Follow-up visits and individuals by physician type.

(a) Follow-up Visits



(b) Individuals

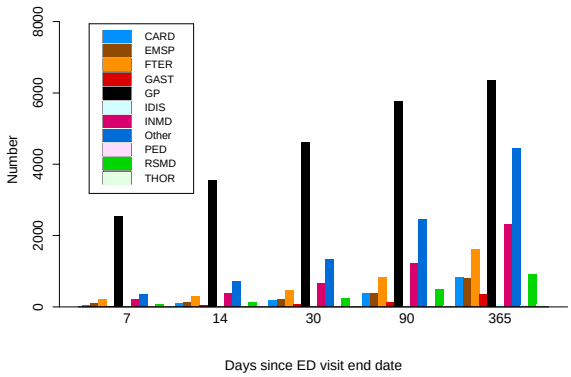
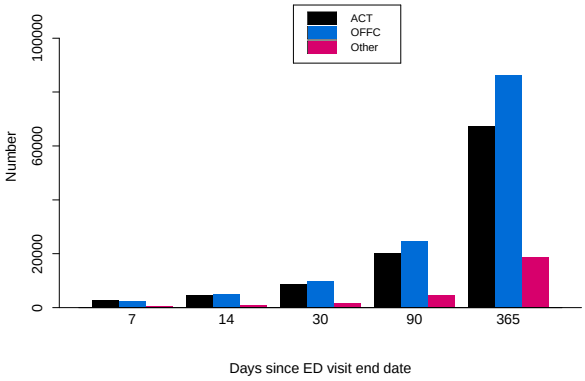


TABLE F.8: Follow-up visits and individuals by facility type for the discharged subset.

	Days Since ED Visit End Date				
	7	**14**	**30**	**90**	**365**
Follow-up visits					
n	5,749	10,552	20,032	49,639	172,597
ACT	2,763 (48.1)	4,718 (44.7)	8,524 (42.6)	20,096 (40.5)	67,319 (39.0)
OFFC	2,549 (44.3)	4,981 (47.2)	9,734 (48.6)	24,833 (50.0)	86,375 (50.0)
Other	437 (7.6)	853 (8.1)	1,774 (8.9)	4,710 (9.5)	18,903 (11.0)
Individuals					
ACT	1,148 (34.1)	1,551 (30.8)	2,166 (30.2)	3,369 (32.6)	5,252 (36.2)
OFFC	1,947 (57.9)	3,010 (59.8)	4,230 (59.0)	5,506 (53.4)	6,184 (42.7)
Other	267 (7.9)	475 (9.4)	772 (10.8)	1,444 (14.0)	3,053 (21.1)

FIGURE F.2: Follow-up visits and individuals by facility type.

(a) Follow-up Visits



(b) Individuals

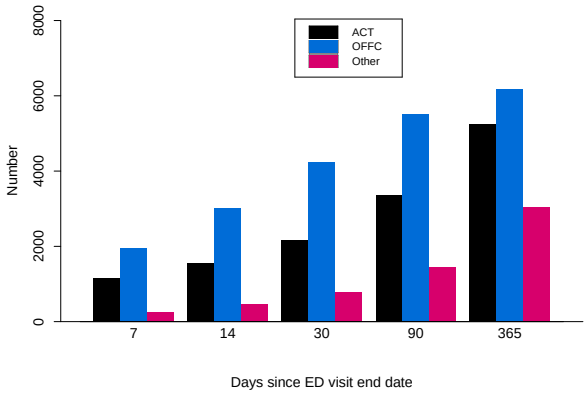
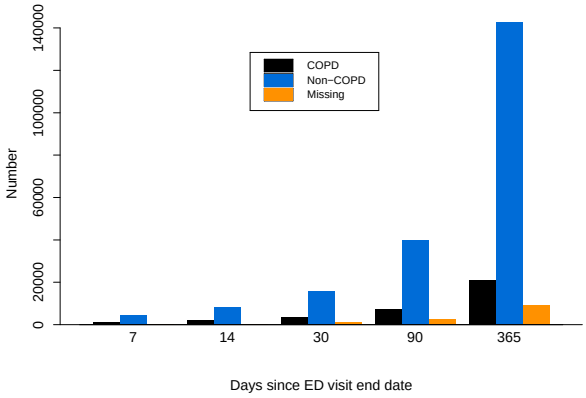


TABLE F.9: Follow-up visits by diagnosis for the discharged subset.

	Days Since ED Visit End Date				
	7	**14**	**30**	**90**	**365**
Follow-up visits					
n	5,749	10,552	20,032	49,639	172,597
COPD	1,187 (20.6)	1,966 (18.6)	3,330 (16.6)	7,084 (14.3)	20,897 (12.1)
Non-COPD	4,352 (75.7)	8,133 (77.1)	15,681 (78.3)	40,080 (80.7)	142,761 (82.7)
Missing	210 (3.7)	453 (4.3)	1,021 (5.1)	2,475 (5.0)	8,939 (5.2)
Individuals					
COPD	744 (22.9)	1,054 (22.2)	1,441 (22.1)	2,073 (23.3)	3,108 (25.6)
Non-COPD	2,389 (73.5)	3,421 (72.1)	4,561 (69.9)	5,761 (64.9)	6,385 (52.7)
Missing	119 (3.7)	273 (5.7)	527 (8.1)	1,045 (11.8)	2,634 (21.7)

FIGURE F.3: Follow-up visits and individuals by diagnosis type.

(a) Follow-up Visits



(b) Individuals

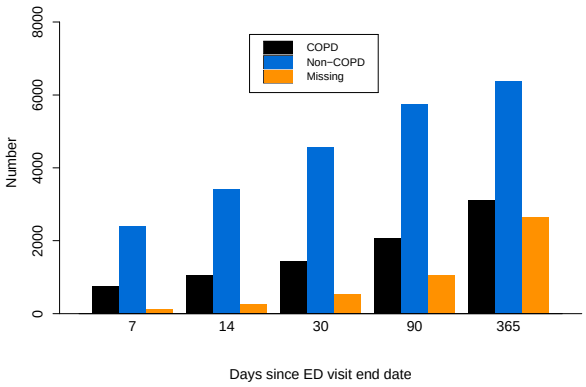


TABLE F.10: Summaries for time to first follow-up visit by pSES (age 55–64) for the discharged subset.

pSES	Median Time (Days)	95%CI (Days)
A	16	13 to 22
R	22	19 to 27
S	15	13 to 19
W	10	8 to 13

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